

Erasmus School of Economics

Thesis

**Warranty and Brand Elements as Determinant of Purchase
Decision: The Mediating Effect of Risk Perception.**

Author: Eduardo Torres Romero

Student Number: 434517

Supervisor: Dr. V.G. (Vijay Ganesh) Hariharan



Master of Science in Marketing

Department of Business and Economics

Erasmus School of Economics

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Abstract

Current companies dedicate considerable efforts in maximizing the efficacy of their sales strategy. With the aim of selling the best product to the right target, managers strive to figure out which marketing cues are the most effective ones, to better allocate the budget in those with a higher impact on consumers, during the purchase process.

Through different experimental designs, this thesis pursues to demonstrate how important marketing cues, such as warranty, brand trust and familiarity, play a significant role in the decision making process. The results show that both brand elements get to increase the probability to purchase, by transferring the trust and familiarity toward the brand, into a reduction of the purchase's risk perception.

On the other hand, this study finds risk perception to be a mediator of the effect of brand elements on purchase decision. Increases in brand elements will lead to decreases in the risk perception toward the product and, in consequence, increases in the likelihood to buy. On the other hand, warranty is not significant in the model, by not having any effect neither in risk perception, nor purchase decision. Therefore, this finding shows the importance of brand elements when trying to reduce an offer's risk perception, and the strong linkage between risk perception and the probability to purchase the product.

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At last, I would like to dedicate this thesis, and all what I have got, to my grandmother, Marina.

1. Introduction

1.1 Introduction to the Topic

For many years, in those markets in which product quality is unobservable, companies have used marketing cues –such as warranty and brand name- to allow consumers to infer it. On the other hand, marketers have also used warranty length to reduce risk perception, by assuming that it has a direct (and inverse) relationship with purchase decision (Ostuland, 1974; Shimp & Bearden, 1982; White & Truly, 1989).

During the purchase process, consumers focus on ways to minimize the risk perception in high-involvement products and, therefore, maximize the utility/likelihood to buy of their choices (Mitchell, 1992). Some marketing cues, such as warranty length, are useful to reduce the risk associated to a product, and increase the likelihood to buy it (Shimp & Bearden, 1982). The KIA’s campaign “7 year’s warranty”, or the slogan of AUDI “12 years warranty against corrosion” can be some examples of how companies use warranty length to reduce consumer’s risk perceptions. Another example can be the Apple Care, which is a warranty extension, where the company offers technical support up to 3 years after the purchase.

At the same time, the degree of risk consumers perceive from a given option will also depend on the goal of their purchase (Park & Stoel, 2005), and other factors that relate them to the brand (e.g familiarity and trust toward the brand...) (Mitchell, 1992; Cox & Rich, 1964). Hence, when dealing with a choice, consumers will also be affected by the previous experience they had with the brand, and how the outcome of that experience was. The amount of experience with a brand can be translated in the familiarity with it (Baker et al. 1986), and how this experience is translated in beliefs and confidence toward the brand, can be defined as trust (Deutsch, 1960).

In this thesis, I will be investigating how warranty length can increase the likelihood to buy of a given option, and how some brand elements –such as trust and familiarity- might be a key piece in the relationship of both variables.

1.2 Empirical Model

In this section I will expose what the objective of the research is, what the questions that came to my mind while formulating the hypothesis were, and how does the conceptual framework look like.

1.2.1 Research problem

This research aims to give deeper insights into the role of a particular marketing cue (warranty) in the entire purchase decision process. The main objective is to measure whether a warranty's length increase does have a negative effect in the risk perception, increasing the likelihood to buy the car, or not, depending on brand trust and familiarity.

1.2.2 Problem Statement and Research Questions

The problem faced in this research is the next:

What is the influence of the warranty length, brand trust and brand familiarity in the purchase decision?

As we will see in the next chapter, when dealing with multiple options, risk perception plays a significant role in determining the brand chosen. When dealing with a situation of uncertainty, people tend to gather more information, through experiences with the brands. Those experiences can lead to more familiarity and trust toward it, so both variables could be seen as resultants of the information consumers take to reduce the risk in their purchases. But, does the warranty length really have any effect in the purchase decision? Do firms use different warranty lengths as risk indicators? Those questions will be answered in this paper, by mainly measuring the effect of warranty length in the purchase decision, from a brand perspective.

1.3 Academic Relevance

Prior literature has mostly focused in the effect of warranty length on risk perception (Shimp & Bearden, 1982; Erevelles, 1993) and product quality (Lutz, 1989; Akdeniz, Calantone, & Voorhees, 2013; Boulding & Kirmani, 1993), by using high scope cues moderators, such as third parties' information, consumer knowledge, and brand reputation; or low scope ones, such as price (Srivastava & Mitra, 1998; Akdeniz, Calantone, & Voorhees, 2013). Nevertheless, it has not been yet studied the final effect of warranty length on purchase decision, by controlling the effect of brands. That it to say, by having into account the moderator effect of brand elements in the relationship between warranty and purchase decision, and measuring those effects with real brands. In fact, past researches base their models on the use of fake/artificial brands, where they give to respondents the information they need to imagine how the brands would be (e.g "Imagine a brand with high reputation and good reviews on third parties").

In this thesis it will be studied this effect, by adding two main variables: brand trust and brand familiarity. Brand trust will represent the degree of confidence/trust consumers have toward a given option/brand, and brand familiarity will explain how familiar is each of them to those consumers. On the other hand, "risk perception" will appear as a mediator variable in the model, so the effect of all independent variables on the purchase decision will be mediated by the perception of risk consumers have toward the option. As commented, when dealing with multiple options, consumers try to minimise the risk associated to the product, to maximise the probability of purchase it. Hence, risk perception is a key factor in the relationship between warranty and brand elements, and purchase decision.

It will be expected both brand elements to have a direct effect in the mediator variable (i.e risk perception), but at the same time they will play the moderator role in the model, to figure out if the warranty length has a different effect depending on the level of trust toward a brand, and/or the familiarity with it. In addition, risk perception toward the product will be introduced in the model, to mediate the effect of warranty length, brand trust, and brand familiarity in purchase decision.

In sum, a new approach about warranty's effect can be shown with this research, where long-term marketing decisions (i.e brand trust and familiarity) will be the main actors to figure out "how to reduce the risk perception of consumers" and, therefore, "how to

increase their purchase intention”.

1.4 Managerial Relevance

When launching a new product, it is crucial to know which factors can be determinant to be ahead of the competition, and how the company, through the right strategies, can infer them. In this thesis, it is aimed to demonstrate that managers can conduct strategies to increase the consumer’s trust and familiarity, to obtain greater effects of warranty in the decision-making process, and reduce the risk perception of the product. In other words, demonstrating that both brand elements are significant players, when measuring the risk, can “open” additional doors when planning the sales strategy. Therefore, this thesis would be relevant to better understand how consumers react to changes in the warranty, and how their past experience with the brand moderates the effect of these changes, and directly affects their perception of risk.

2. Literature Review

Based on prior literature, in this chapter I will first explain what each variable is, and then, what has been studied about the relationships between some variables. In other words, I will provide the information on which I based to formulate the hypothesis presented in the chapter 3.

2.1 Warranty

High involvement products, like cars, make consumers to get more involved into the purchase process, but also generate more doubts in the product reliability, and require more time to make the decision. Due to the high prices and the effort used during purchase, high involvement products need a marketing cue to inform about the product reliability, and reduce the risk associated to the purchase; this marketing cue is the warranty (Huang , Liu , & Murthy , 2007).

During the buying process, since products are becoming more and more similar, consumers need to compare the different options by using some marketing cues, such as brand name and warranty. The last one can be seen as insurance provided by the manufacturer, to repair possible future problems related to the product (Akdeniz, Calantone, & Voorhees, 2013). The warranty length makes the manufacturer responsible to fix those “faults” in a certain period of time, what leads us to deduce that the longer the warranty length, the more support the consumers get.

Nevertheless, Boulding & Kirmani (1993), state that longer warranties not always lead to positive perceptions toward the product (i.e an increase in the quality perception), since a “bigger” protection can be a signal of lower reliability (e.g consumers may think that a given car has a high warranty length because it could break in that time, so it will need it). On the other hand, Spence (1977), reaches the opposite conclusion, as he argues that high-quality products will be accompanied by high warranty lengths -which provides a better protection against failures-, while low-quality products will offer low warranty protection. The reason is that high protective warranties need to be accompanied by high quality products, to avoid the costs of possible failures. Therefore, companies that set those warranty lengths make sure there will not be necessary to make use of them, by producing very good quality products.

2.1.1 Warranty and Risk Perception

As mentioned, warranty has been a key point to infer the car's quality (Srivastava & Mitra, 1998), and to reduce the risk perception toward it; leading to an increase in the purchase intention (Akdeniz, Calantone, & Voorhees, 2013). Moreover, Shimp & Bearden (1982) shown that the effect of the warranty length in risk perception is only present when the first one is high, while there are no differences when the warranty is poor or inexistent. This statement leads us to think that, first, warranty length does actually have an (negative) impact in the risk perception and, at last, this impact is just visible when the length is high enough to call the consumer's attention. On the other hand, Sunil Erevelles (1993) claimed that, even though warranties had no direct casual influence on the consumers' attitude toward the product, it does actually have a direct effect on risk perceptions, considered as "insurances in the event of product failure".

In sum, many researches have been conducted around the warranty's effects, and its paper as a marketing cue. Hence, it is only to be expected that the effect of warranty's increases will be negative in the consumer's perceived risk toward the purchase. Nevertheless, as commented in the section 1.1 of this paper, there is no past literature about the effect of warranty in risk perception, by using real brands in the experiment.

2.2 Brand Trust

Trust can be related with the expectations consumers have that a specific transaction will generate positive outcomes, and the risk associated with having such expectations (Deutsch, 1960). Brand trust can also be defined as "the willingness of the average consumer to rely on the ability of the brand to perform its stated function" (Chaudhuri & Holbrook, 2001; Delgado-Ballester , 2001). Therefore, as it is the ability or willingness to rely on a brand, it stems from the knowledge the consumers have about it, based on their past experience (Lau & Lee, 1999). Such experience can be produced by any direct or indirect interaction with the brand, but there is one specific contact that gains more relevance as a source of trust, and it is the consumption experience (Delgado-Ballester , 2001). Hence, brand trust is an element mainly occasioned by the interaction between two factors: expectations and outcome; which always are built based on the experience with the brand.

In addition, based on the model exposed by Lau & Lee, (1999), three agents affect brand trust: brand characteristics (e.g brand reputation, predictability and competence), company characteristics (e.g reputation, integrity, etc.) and the consumer interaction with the brand (e.g brand liking, brand experience, etc.). Even though all the three factors have a positive effect with brand trust, brand characteristics are more relevant than other factors. Therefore, Lau & Lee, (1999) urge to mainly strengthen the brand characteristics to increase the brand trust and, in consequence, boost the purchase intention, and brand loyalty. Hence, trust is an important factor in the relationship between customers and brands.

In sum, once it has been talked about what brand trust is, what are its main sources, and how can it relate consumers and brands through past experience, it is needed to explain how brand trust can alter the purchase intention and risk perception of clients. Past literature mainly focus on the effect of brand trust on loyalty and commitment toward the brand, but there are also many authors who have studied how brand trust can affect risk perception, mostly during the online purchase process.

2.2.1 Brand Trust and Risk Perception

On the one hand, Luhmann (2000) directly relates trust with risk, by defining it as a solution for a specific problem of the last one. Trust requires a previous engagement, as consumers decide if they want to trust, or not, depending on the risk they perceive from the brand. Thus, according to Luhmann (2000), the relationship between trust and risk is very close, as the first one is a key determinant of action when it is perceived a risk of negative outcome. On the other hand, Kim, Ferrin & Rao (2008) expose that trust affects negatively the consumers' perceived risk of a transaction, but it does it positively to the purchase intention. Some authors differ in their view about the relationship between trust and perceived risk. Kim, Ferrin & Rao (2008) argues that there are two ways trust can act to reduce the perceived risk on online purchase decisions: by reducing the risk perception, which acts as a mediator of purchase intention (Deutsch, 1960), and positively affecting to the purchase intention (i.e when trust increases the purchase intention also does it) (Ratnasingam, 1998; Rousseau, Sitkin, Burt, & Camerer, 1998; Pavlou, 2003).

Moreover, Chang & Chen (2008) also recognises risk perception as a mediator of trust and purchase decision, and a direct (and positive) relationship between trust

and purchase intention (Teo & Liu, 2007). Nevertheless, it is also added two more types of relation identified in past literature. First, perceived risk precedes trust, what means that low levels of risk perception leads to high levels of trust (De Ruyter, Wetzels, & Kleijnen, 2001). Second, the relation between two factors is non-recursive; that is to say, relationships between trust and risk perception are reciprocal (Mitchell, 1999).

In conclusion, even though it has been deeply studied the relationship between trust and risk perception, there is a lack of knowledge of those factors in sectors like automotive, since literature has been mainly focused on e-commerce, and the risk of buying online. In addition, there is no agreement in what types (and how many) relations do brand trust and risk perceptions have, so it is difficult to extract a unique conclusion from past researches.

2.3 Brand Familiarity

Brand familiarity can be defined as "an unidimensional construct that is directly related to the amount of time that has been spent processing information about the brand" (Baker et al. 1986), and the direct or indirect experiences consumers have with brands (Alba & Hutchinson, 1987; Kent & Allen, 1994). Alternatively to the definition of familiarity as an "unidimensional construct" -made by Baker et al. (1986)-, other authors like Alba & Hutchinson (1987) indicate that it is a multidimensional phenomenon, where "different types of experiences lead to the development of different dimensions of consumer expertise".

On the one hand, direct exposures are largely composed by interactions with salespersons, purchases and usages. On the other hand, indirect experiences are represented by actions such as word of mouth and information search. Therefore, an increase in the number of exposures with the brand (i.e direct and indirect), will lead to higher brand familiarity (Alba & Hutchinson, 1987).

Consumers see brands as familiar or unfamiliar ones, depending on the knowledge they have stored from them (Keller & Campbell, 2003). Nevertheless, as mentioned, people can hold different associations of familiarity for each brand, based upon the degree of exposure they have had with them (Alba & Hutchinson, 1987; Keller & Campbell, 2003). Therefore, people get familiar with brands through several exposures, from which they store in their memory different types of associations.

In conclusion, as it happened with brand trust, familiarity with a brand seems to be very wired to past experiences. Nevertheless, even though both terms are fairly correlated, the latter one is mostly occasioned by a number of interactions, or exposures, rather than by the outcome of those experiences with the brand (Baker et al. 1986).

2.3.1 Brand Familiarity and Risk Perception

The risk consumers feel during the purchase process, due to the uncertainty of product outcome, may be an inverse function of the confidence they feel toward the brand (Park & Stoel, 2005). Laroche et al. (1996) studied the influence of brand familiarity and confidence on purchase decision, in a traditional store, reaching the conclusion that “consumer's confidence toward a brand may result from his/her familiarity or experience with the brand”. Hence, those consumers who are more familiar with a particular brand, will develop greater confidence toward it, and, in consequence, will perceive less levels of risk when making the purchase (Park & Stoel, 2005).

On the other hand, in a B2C electronic commerce study from Lim (2003), participants disliked dealing with unknown brands, due to they were afraid of being cheated, and not receiving the products the ordered. In addition, those participants stated that they “rely on references from other people instead of doing it trial and error”. For instance, well-known and familiar brands, such as Amazon, are perceived as less risky, due to its positioning and good reputation (Gefen, 2000; Lim, 2003). Therefore, consumers do prefer dealing with brands they know, and consider familiar, than giving their trust to companies they do not have enough experience with.

In conclusion, -as commented in the brand trust section- e-commerce has monopolised the attention of the authors, when studying brand familiarity and its effect on risk perception. It has been broadly commented how retrieved information from memory (i.e familiarity) reduce perceived risk, and how people have a strong preference for famed brands, than for outsider ones. In sum, the relationship between both factors seems pretty straightforward, but it is needed to get additional insights from less “risk perception saturated” sectors, like the automotive one.

2.4 Risk Perception

The risk perception term was firstly introduced in the earlier 60's, where it was interpreted as an element composed by two dimensions: uncertainty and adverse consequences (Bauer, 1960). Later, Cox & Rich (1964) defined it as “the nature and amount of risk perceived by a consumer in contemplating a particular purchase decision”. Every consumer has different purchase goals, and uncertainty comes from detecting those goals and trying to match them with the product offering (Park & Stoel, 2005). Moreover, it can be said that uncertainty is a subjective term, as it will depend on the goals each consumers want to reach when making the purchase. For instance, if the goal of a consumer was surprising his fiancée with a wedding ring, he might be concerned about the ring brand that seems the most striking. Thus, perceived risk is an implicit element in the purchase process, since customers (most of the time) are not able to know if they will achieve their goals with the product or brand desired (Cox & Rich, 1964).

As Mitchell (1992) suggested, the perceived risk is an important tool to explain consumer's behaviour, as consumers are much more motivated to avoid risk than to maximise the utility of the purchase.

On the other hand, the amount of stake in a buying process will depend on the importance of the goals established, and the costs of trying to achieve those goals (Cox & Rich, 1964). Hence, the more important the goals are for the consumer, the more involved he/she will be with the purchase. Cost of risk was deeply studied by Jacoby & Kaplan (1972), where they introduced risk perception as a five-component element, divided in: financial, performance, social, physical and physiological perceived risk.

Table 1: Components of risk perception

5 components of perceived risk	Definition
Financial risk	Also called economic risk, it makes reference to the possibility of monetary loss when adoption the product or service.
Performance risk	Uncertainty caused by the performance of the product, and its quality. In other words, the risk attached to future product failures.
Social risk	It refers to the doubt consumer has about his/her environment, and the way they will react to his/her purchase (i.e by accepting it or not).
Physical risk	Possibility that the products can be harmful for the consumer's health.
Psychological risk	It is related to the stress consumers can face when dealing with various options during the purchase process.

Source: Jacoby & Kaplan (1972)

Even though the five components of risk exposed in the table are the most used ones, subsequent authors have also inquired in additional components of perceived risk, such as: time-loss, personal, privacy and source perceived risk. Time-loss risk is the consumers' perception of wasting time due to the shopping behaviour (Roselius, 1971). Personal risk is related to the fear of suffering because of the buying decision; for instance, if their credit card information is stolen during the purchase (Jarvenpaa & Todd, 1996). Privacy risk is very related to the previous one, and grows from the possibility that companies gather some consumers' information and use it in inappropriate ways (Jarvenpaa & Todd, 1996). At last, source risk is the possibility that business from where consumers buy the products are not trustworthy (McCorkle, 1990).

2.4.1 Risk Perception and Purchase Intention

There is much being written about the relationship between risk perception and purchase intention, where it is assumed an indirect direction, that is to say, increases in the perception of risk leads to a reduction of the purchase intention (Ostuland, 1974; Shimp & Bearden, 1982; White & Truly, 1989). Cox & Rich (1964) found clear presence of perceived risk in choice postures, based on a telephone shopping case, with women who shopped in department stores. Moreover, Arndt, (1968) identified a relation between perceived risk and “try, or not try” a new product, during the introduction of a new brand coffee among housewives. In addition, Cui et al (2009) detected four strategies to deal with a “new risky product”, being one of those strategies the decision making process, what relates again both terms. At last, Mitchell (1992) stated that in the stages that composed the consumer decision process (i.e problem recognition, information search, evaluation of alternatives, purchase decision and post- purchase behaviour) “significant amounts of risk are involved”.

To end with, some authors studied the differences of this relationship depending on the gender; for instance, Barbarino & Strahilevitz (2004) demonstrated that the effect of the perceived risk on the online purchase decision is greater in females than in males, in other words, women tend to be more risk averse.

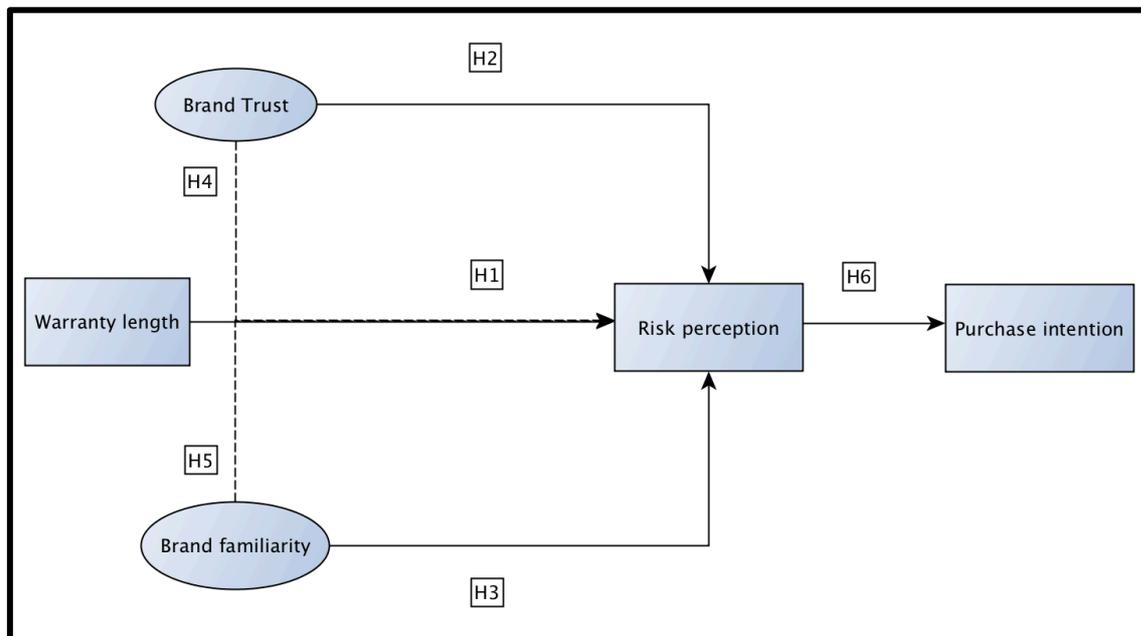
Therefore, by just mentioning some of the past researches related with these variables, it is very evident what the relation between both elements is, and how can we expect it to be in this paper. Nevertheless, even if this matter has been deeply observed in many markets and products -mostly in the e-commerce-, there is no past evidence about risk perception effects in the automotive market, from a brand perspective. Hence, it is not possible to mention literature that perfectly fits with the purpose of this thesis.

3. Conceptual Framework and Hypotheses

3.1 Conceptual Framework

Previous chapters have given insights about the expected relationships between the mentioned variables, which can be visually represented in the conceptual framework above. Based on the literature gathered in the chapter 2, we can infer what the direction of the relationship is, but first, we need to give a response to the next questions: Why does warranty reduces the risk perception? What is the paper of the brand elements in this relationship?

Illustration 1: Conceptual framework¹



Mitchell (1992) developed a perceived risk theory based on the description of five stages related to the purchase process, and the roles that risk perception plays into those stages. As mentioned along the paper, there are two types of uncertainty: knowledge uncertainty (regards information about the alternatives) and choice uncertainty (regards uncertainty about what option to choose). When evaluating the alternatives, consumers see products as “bundles of attributes”, but the uncertainty comes when they are not able to allocate the relative importance of each attribute, and the value that can be predicted from each of them. As an attribute, warranty is an important tool to reduce the

¹ The Hypothesis 7 –where it is assumed that risk perception acts as an indirect mediator of brand elements on purchase intention- is represented apart in the Illustration 5 of this paper.

uncertainty during the product evaluation, since (like price) it is an observable instrumental risk-reduction cue (Shimp & Bearden, 1982).

That is to say, the warranty length is an easy indicator of the predicted value of a given product, (i.e higher warranties will assure longer durability of the product). However, once it is known why warranties may reduce the risk perception during the purchase process, it is left to know how brand elements come into play in this theory.

Cox & Rich (1964) stands out two main strategies to avoid risk during the decision-making process: relying on past experience and on the experience of others. By looking at the literature exposed in the chapter 2, we can remember that brand trust and familiarity are occasioned by past experiences with the brand (Lau & Lee, 1999;Alba & Hutchinson, 1987). So, we know that past experiences help to reduce the risk perception, and the brand elements exposed are mainly generated by previous exposures with the brand. Hence, we can infer that both factors will (separately) reduce the perceived risk and, may increase the effect of the warranty in the risk-reduction process. In other words, consumers seek for information (through experiences with the brand) to reduce the risk (their goal), those experiences lead to higher brand trust and familiarity, which at the same time make consumers being more sensible to changes in warranty length, moderating its effect in the risk perception of the product.

3.2 Hypotheses

In this section I will briefly explain each hypothesis, based on the reasoning made in previous sections.

(H1) → As deeply commented, consumers use warranty as an “instrumental cue” to reduce the risk perceived in a specific purchase, since it is an easily observable attribute that indicate the future value of the product (Shimp & Bearden, 1982). Hence, it is expected an inverse relationship between warranty length and risk perception.

(H2) → Many authors, such as Kim et al. (2008) and Deutsch (1960) evidenced that trust toward a brand reduce the perception of risk, since trusting a brand makes you being less “under alert” toward it. Therefore, I will assume the same relationship in this thesis; that is to say, increases in brand trust lead to decreases in risk perception.

(H3) → As Park & Stoel (2005) and Lim (2003) studied, brand familiarity is also wired to risk perception, since consumers perceived less risky those brands considered “well-

known”, and in the other way around. Hence, in this thesis I will presuppose that brand familiarity negatively affects risk perception.

(H4 & H5) → Based on the theory exposed previously (Mitchell, 1992; Cox, 1964), we can infer that brand elements, such as trust and familiarity, may contribute to increase the impact of warranty length on risk perception. Hence, it will be expected brand familiarity and brand trust to moderate the effect discussed.

(H6) → Many authors have profoundly studied the relationship between risk perception and purchase intention, where there was an agreement in the indirect direction between parts (Ostuland, 1974; Shimp & Bearden, 1982; White & Truly, 1989). Therefore, I will expect nothing but the same (inverse) relationship in this model.

(H7) → As previously commented, there are several studies made about the (negative) effect of brand elements on risk perception (Kim et al., 2008; Deutsch, 1960; As Park & Stoel, 2005; Lim, 2003) and the same effect in the relationship between risk aversion and purchase intention (Ostuland, 1974; Shimp & Bearden, 1982; White & Truly, 1989). Hence, it can be deduced that risk aversion mediates the relationship between both brand elements and purchase intention, in this model.

Table 2: Summary of hypotheses

H1	The higher the warranty length, the lower the risk perception toward the product.
H2	The higher the trust toward a brand, the lower the risk perception toward the product.
H3	The higher the familiarity with a brand, the lower the risk perception toward the product.
H4	The higher the trust toward a brand, the more negative the effect of the warranty length on the product’s risk perception.
H5	The higher the familiarity with a brand, the more negative the effect of the warranty length on the product’s risk perception.
H6	The lower the risk perception toward a product, the higher the product’s purchase intention.
H7	The relationship between brand elements and purchase intention is mediated by the risk perception toward the product.

4. Methodology

In order to test the hypothesis proposed, the data was gathered through 6 different experimental designs. In the next sections I will explain the market where the data is based on, as well as the methodologies used to build the experiments.

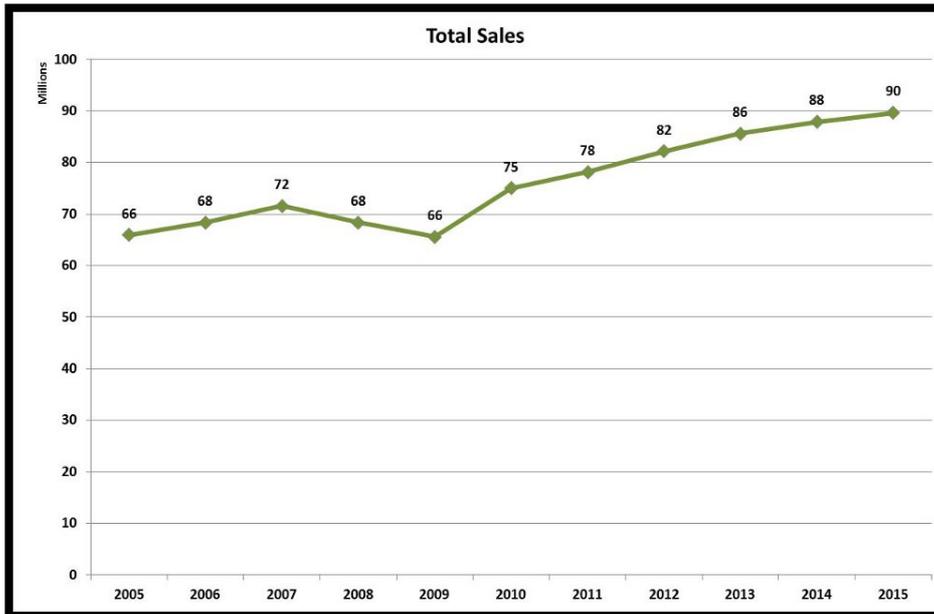
4.1 Automobile Market

The next paragraphs will make reference to why I chose the automotive market, and what are some of the current characteristics of it.

As briefly explained, warranty is a marketing cue used to offer a protection in those products which are commonly called as high-involvement ones. When someone thinks about a product, which requires an important spending of time and money to buy, it might (firstly) come up a house or a car. Since housing market is much complicated and convoluted to deal with, it seem interesting to choose a sector which gave me more flexibility and opportunities to get the information I needed: automobiles. At last but not least, the magnitude and relevance of the automotive market made possible using brands that everyone knew and had some experience with.

The existing manufacturing is mainly characterised by: rapid technology changes, globalised markets, strong competition, poorly differentiated products, and more educated and fussy consumers (Murthy & Djamaludin, 2002). As one of the biggest markets in the world, the automobile's sales have grown a 20% since 2010, reaching 90 millions of cars in 2015 (OICA, 2015). This sector employs more than 12 million people in the European Union, which represents the 5.6% of the EU workforce. On the other hand, across 26 different countries, more than 17 millions of cars are produced each year in the EU, generating over €396 billions in tax contributions. At last, the automotive industry is the largest private invention in R&D in Europe, investing over €40 billion, and granting more than 6,000 patents in 2014 (ACEA, 2016). In sum, this market is a huge economy factor, which needs managers to have as much information as possible, and use it in order to create the best offers they can.

Illustration 2: Worldwide car sales per year



Source: OICA, 2015

4.2 Research design

To be able to test the hypotheses, different experimental designs were built and spread out, through online tools (i.e Google forms and social media). The respondents were randomly given one out of the six existent experiments where they, first, had to respond questions related to brand trust and brand familiarity toward a showed car brand. Then, it was given a description of an “offer from the dealer”, and asked the respondents to answer some questions related to risk perception and purchase intention, based on the offer. At last, a few demographic questions were needed to respond.

In order to compare the differences between high and low warranty length’s effects, the variable “warranty” was manipulated by using two levels (i.e 2 and 6 years). In addition to the manipulation, 3 different car brands were introduced (i.e Audi, Mercedes and BMW), leading to a 2x3 questionnaire experiment. First of all, three different brands were used into different questionnaires to avoid the comparison effect, and to make it more manageable to respondents. Secondly, the mentioned brands were selected by assuming them to be almost equal in terms of reputation, and “social status”.

Therefore, it was assumed no more differences between brands but the owns’ brand elements measured during the experiment (i.e brand trust and brand familiarity). The

rest of the variables, and the given information, remained the same among experiments, to allow the right measurement of the warranty length's changes.

At last, as seen in the Appendix A, the warranty levels were introduced as one more part of the information presented, to avoid people to realize of the main purpose of the experiment.

4.3 Measurements

In this section it will be explained how the questions that integrate the questionnaire were made, and what are the sources used to build them (i.e each variable is calculated based on previous researches). In the Table 3 all the variables and items are exposed.

- ❖ **Brand trust** was measured by calculating a four-item index of agreement, after asking people to rate from 1 to 7 the next statements, related to one of the three brands: “I trust this brand”, “I rely on this brand”, “This brand is safe” and “This is an honest brand” (Chaudhuri & Holbrook, 2001).
- ❖ **Brand familiarity** was calculated through a three-item scale from Laroche et al (1996) and Kent & Allen (1994), by asking respondents to rate from 1 to 7 how much experience (i.e “no previous experience/a lot of experience”), information (i.e “no information/a lot of great information”) and familiarity (i.e “unfamiliar/familiar”) they had with the showed brand.
- ❖ **Risk perception** has been measured with a three-item scale, composed by two different components of risk (i.e financial and performance). The five items were adapted in line with the theory developed by Shimp & Bearden (1982), and Jacoby & Kaplan (1972), where respondents had to rate a 7-point bipolar scale with each of the statements showed in the Table 3.
- ❖ **Purchase intention** was measured by using a one-item scale, where people were asked to rate from 1 to 7 “how likely they were to purchase this option”. It was not used more items related to the “willingness to pay”, because the price was already showed, and the only information required was the strength with which they were willing to buy that option. Moreover, to obtain the control variables, a few very short demographic questions were asked, such as: age, income and gender.

At last, it is worth to mentioning that, during the measurement of “brand familiarity” and “risk perception”, it was introduced a few inverse questions (see Table 3), to figure out whether respondents were answering the items randomly, or not.

Table 3: Variables and items used in experimental designs

Variable	Item
Brand Trust	1. “I rely on this brand”
	2. “I trust this brand”
	3. “This is an honest brand”
	4. “This brand is safe”
Brand Familiarity	1. “No previous experience”/ “A lot of experience”
	2. “A lot of great deal information”/ “No information” *
	3. “Unfamiliar/Familiar”
Risk Perception	1. “How certain are you that it would work satisfactorily” (Uncertain-certain)*
	2. “Considering the investment involved, for you to purchase it would be” (Not risky at all-Very risky)
	3. “From this purchase, I would get my money’s worth ” (Totally true-Not true)
Purchase Intention	1. How likely are you to purchase this option (Very unlikely-Very likely)

* Inverse items

Source: Literature Chapter 4.3

4.4 Data Collection

The experimental design was made and sent through Google Forms, allowing respondents to fill it in from the mobile device, or computer. Some of the respondents were people from my own network (i.e friends and family), but it was also used the “snowball sampling”², to better reduce the bias of just reaching known subjects. The responses were gathered during May, and the link was posted on social media tools, such as Facebook and Whatsapp.

² Technique where the actual respondents recruit another subjects, creating an exponential network of responses.

5. Analysis

5.1 Sample

In total, the amount of responses gathered was 210. From this set, N=180 responses were finally used, with 30 subjects in each of the treatment groups. The responses removed were randomly selected from those questionnaires with more than 30 subjects, by just taking 30 responses from each experiment, to better make sure that the amount of responses of each group was the same.

The research sample shows an almost equal distribution in terms of gender, where the 57.2% (n=103) of the respondents are males, being the 42.8% (n=77) left female (see Table 4). In addition, the sample results indicates a clear tendency toward the young age interval of 18-25 years old, with the 68.3% (n=123) of the subjects positioned inside this range (see Table 5). At last, among the respondents, the “no income” range is the most repeated one, representing the 32.2% (n=58) of the total sample, followed closely by subjects who are earning “less than 10,000€ a year”, who compose the 27,8% (n=50) of the overall respondents (see Table 6).

Table 4: Gender distribution of the sample

Gender	Frequency
Female	77
Male	103

Table 5: Age distribution of the sample

Age	Frequency
Under 18	1
18-25	123
26-45	17
Over 45	39

Table 6: Income distribution of the sample

Income	Frequency
No income	58
Under 10,000€ a year	50
10,000-15,000€ a year	20
15,000-25,000€ a year	21
25,000-35,000€ a year	10
Over 35,000€ a year	21

5.2 Variables' Composition

To get a deeper understanding about how the variables were created from the items exposed in the chapter 4, I have conducted a principal component analysis. Through this analysis, it will be statistically proven the reduction of all the items into the variables exhibited in the Table 3. All the data provided is available in the Appendix C.

5.2.1 Brand Trust

In order to calculate brand trust, the four items “I rely on this brand”, “I trust this brand”, “This brand is honest” and “This brand is safe” were taken into account. Before conducting a principal component analysis, the KMO measure of sampling adequacy and the Bartlett's Test of Sphericity were checked. The KMO results reflected a satisfactory value of .855, and the Bartlett's Test showed that that the correlation matrix is not an identity matrix ($\chi^2(6, N=180) = 694.054, p < .001$), what is a minimum standard to conduct the analysis. When looking at the factor analysis and scree plot, it can be seen that the 85.52% of the total variance is explained by one factor, being the only one with an eigenvalue greater than one (3.421). The component matrix, extracted from the principal component analysis, also shows that all the components load onto one underlying factor. Therefore, it can be concluded that the variable “brand trust” can be extracted from a combination of the three items mentioned.

5.2.2 Brand Familiarity

To create brand familiarity, the items “No previous experience/A lot of experience”, “No information/ A lot of great deal information” and “Very familiar/Not familiar” were taken into consideration. The KMO results reflected an acceptable value of .524, and the Bartlett's Test showed that that the correlation matrix differs from the identity matrix ($\chi^2 (3, N=180) = 115.735, p<.001$). Based on the output extracted from the factor analysis, it can be observed that there is just one factor with an eigenvalue greater than one (1.744), which explains the 58.124% of the total variance. On the other hand, the component matrix also shows that all the components load onto one underlying factor. Therefore, it can be said that the variable “brand familiarity” is the result of the combination of the items exhibited in this paragraph.

5.2.3 Brand Familiarity and Brand Trust

To better make sure that both brand elements are, in fact, different variables in the model, I also conducted a factor analysis with all the items that composed them. The KMO results showed an adequate value of .802, and the Bartlett's Test showed that that the correlation matrix and the identity one, are different ($\chi^2 (21, N=180) = 833.189, p<.001$). When looking at the output extracted, it can be clearly seen that there are two different factors with an eigenvalue greater than one (3.366 and 1.514), which explain the 52.370% and 21.629% of the total variance, respectively. To check whether those factors represent the actual brand elements (i.e each one is formed by the same items mentioned before), I looked at the component matrix, extracted from the analysis. As seen in the Table 7, the items that load into each factor are the same than the ones that constitute brand trust and familiarity. Therefore, as the factor analysis indicates, it can be stated that the brand elements are well measured in the model.

Table 7: Rotated Component Matrix of trust and familiarity

Rotated Component Matrix ^a		
	Component	
	1	2
Trust	.948	.128
Rely on	.864	.207
Honest	.903	.165
Safe	.928	.121
Experience	.049	.908
Information	.148	.322
Familiarity	.112	.890
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization		
a. 2 components extracted.		

Variables used to build brand trust
Variables used to build brand familiarity

5.2.4 Risk Perception

To calculate risk perception, the three items represented in the Table 3 were taken into account. The KMO results reflected an acceptable value of .521, and the Bartlett's Test showed that that the correlation matrix differs from the identity matrix ($\chi^2(3, N=180) = 24.384, p < .001$). When looking at the factor analysis and scree plot, it can be seen that the 46.113% of the total variance is explained by one factor, having an eigenvalue greater than one (1.383). Moreover, the component matrix shows that there is just one factor that embraces all the three items. Hence, it can be determined that the variable “risk perception” can be built from a combination of the three items mentioned.

5.3 Variable's scores among brands

When making the experiment, I decided to use three different brands into different questionnaires, to better reduce the bias of showing questions that respondents had seen before, and avoid using just one brand in the manipulation. Before testing the hypotheses, it is also important to point out what are the variables score mean among the different brands, and see if there is any significant difference. In that way, it can be observed if the respondents behaved significantly different depending on the brand they were facing. In order to figure out if the variables score's mean was not statistically different among the brands, I conducted an ANOVA test.

As it can be seen in the Appendix F, both F statistics of brand trust ($p > 0.05 = .568$) and brand familiarity ($p > 0.05 = .074$) are not significant. Consequently, it can be concluded that there is not statistic difference in the brand elements' mean among the three different car brands used in the experiment. That is to say, respondents did not assign significant different levels of trust and familiarity to the different brands exposed.

Illustration 3: Brand elements' mean by car brand

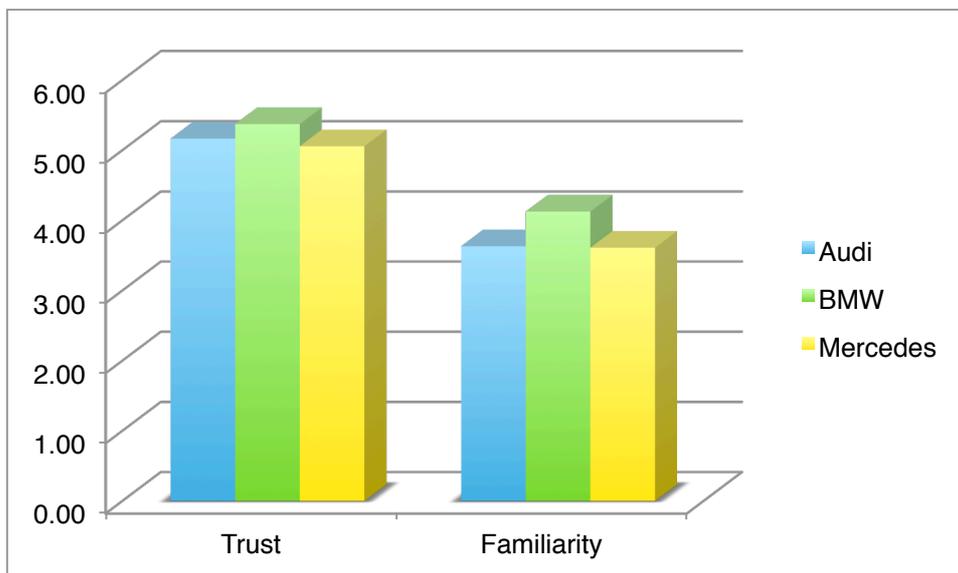


Table 8: Brand trust scores

Brand	Mean	Minimum	Maximum	S. deviation
Audi	5.17	1	7	1.464746
BMW	5.38	1.25	7	1.654795
Mercedes	4.06	1	7	1.824020

Table 9: Brand familiarity scores

Brand	Mean	Minimum	Maximum	S. deviation
Audi	3.63	1	7	1.457108
BMW	4.13	1.33	7	1.535630
Mercedes	3.61	1.66	7	1.158229

On the other hand, the second table in the Appendix F also shows that both F statistics of risk perception ($p > 0.05 = .182$) and purchase ($p > 0.05 = .900$) are not significant. Therefore, it can be said that there is not any statistical difference between those means among the three car brands. That is to say, subjects evaluated the risk and purchase intention equally, regardless the car brand showed.

Illustration 4: Risk perception and purchase intention's mean by car brand

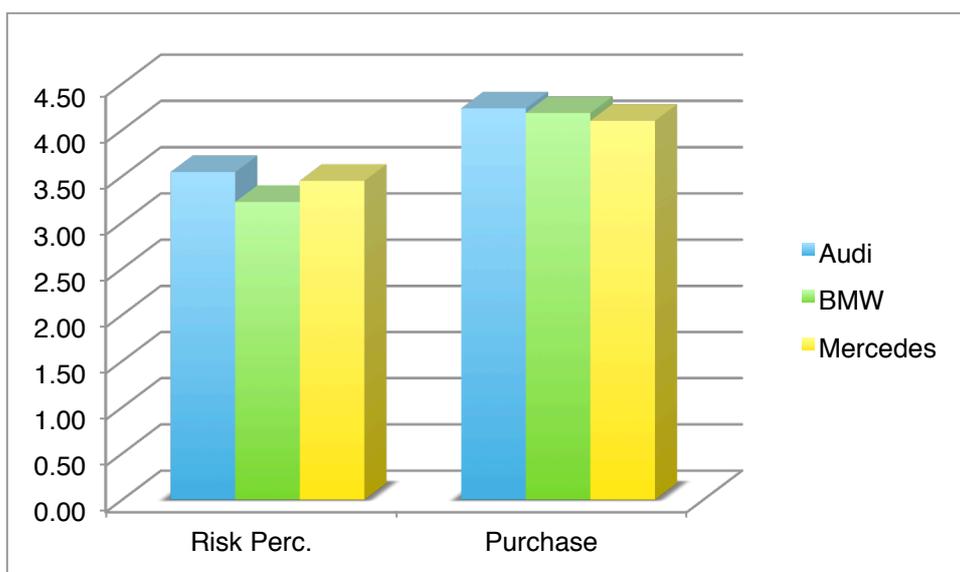


Table 10: Risk perception scores

Brand	Mean	Minimum	Maximum	Standard deviation
Audi	3.54	1	5.33	0.976111
BMW	3.22	1	6	1.114308
Mercedes	3.45	1	5	0.820695

Table 11: Purchase intention scores

Brand	Mean	Minimum	Maximum	Standard deviation
Audi	4.23	1	7	1.650543
BMW	4.18	1	7	1.589069
Mercedes	4.10	1	7	1.580603

5.4 Correlation between variables

When running a linear regression analysis, it is very important to test whether the independent variables are correlated to each other, or not. High correlations between independent variables can lead to insignificant results, and multicollinearity in the model. The Table 12 shows that brand trust and familiarity, as expected, are positively related to each other, what means that higher levels of brand familiarity lead to increases in brand trust, and in the other way around. This is not necessarily a problem, since we already proved in the section 5.2.3 that both terms should not be put together. Therefore, it can be conducted the analysis with all the variables exposed.

Table 12: Correlation between variables

	Brand Trust	Brand Familiarity	Risk Perception	Gender	Income	Involvement
Brand Trust	1	.284**	.102	-.025	.043	.043
Brand Familiarity	.284**	1	.036	-.005	.060	.060
Risk Perception	-.303**	-.376**	.018	.066	.042	.042
Gender	.102	.036	.018	.130	.086	.086
Income	-.025	-.005	.066	1	.078	.078
Involvement	.043	.060	.042	.078	1	1

Correlation is significant at the 0.01 level (2-tailed).*

5.5 Results

In this section it is going to be tested whether the hypothesis proposed are rejected, or not, based on the results exposed. To do so, each hypothesis will be discussed by providing the data obtained from the SPSS outputs, attached in the Appendix D and Table 13.

Table 13: Coefficients from Linear Regression

Coefficients^a					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.816	.553		8.705	.000
Brand_Trust	-.147	.070	-.246	-2.088	.038
Brand_Familiarity	-.295	.076	-.423	-3.906	.000
Gender	.066	.139	.034	.477	.634
Income	.019	.040	.033	.468	.640
Warranty	-.454	.534	-.232	-.851	.396
Involvement	.085	.094	.062	.904	.367
Warranty_trust	.034	.089	.096	.375	.708
Warranty_familiarity	.116	.102	.261	1.134	.258

a. Dependent Variable: Risk_perception

5.5.1 Hypotheses 1: Warranty length and risk perception

In the chapter 3 (Table 2) the next hypothesis was made about the relationship between warranty length and risk perception:

H₁: The higher the warranty length, the lower the risk perception toward the product.

As previously mentioned, warranty length was the manipulated variable in the model, with two levels: low (2 years) and high (6 years). In order to test H₁, a linear regression was computed, to assess whether an increase in the warranty length, from low to high level, leads to a reduction of the perceived risk of the product offered, or not. When looking at the output showed in the Table 13, we can see that the relationship between variables ($R^2=.208$) is not significant ($p>0.05=0.396$), leading to not reject H₀.

On the other hand, it was also conducted a one-way ANOVA, to test if there was any difference between the risk perception's means among the two warranty's levels. The reason to use it is because an ANOVA can be a more robust test, since it takes into account differences in the variable's variances, while the linear regression assumes them to be equal. As seen in the Table 14, there are no significant differences between the two groups ($p>0.05=0.216$), what means that risk perception's means are statistically equal in low and high levels of warranty. On the other hand, it was also conducted another ANOVA to check whether the purchase intentions are different across warranty levels. As seen in the Table 15, there are no significant differences between both groups ($p>0.05=0.124$); hence, the purchase intention of the product does not change depending on its warranty length.

In sum, since the hypothesis proposed could not be supported by the data, we cannot argue that there is any effect of the warranty length in the risk perception associated to the offer.

Table 14: ANOVA for differences between warranty's levels (risk perception)

ANOVA		F	Sig.
Risk perception	Between Groups	1.543	.216

Table 15: ANOVA for differences between warranty's levels (purchase intention)

ANOVA		F	Sig.
Purchase intention	Between Groups	2.385	.124

5.5.2 Hypotheses 2: Brand trust and risk perception

The next hypothesis was developed (Table 2) about the relationship between brand trust and risk perception:

H₂: The higher the trust toward a brand, the lower the risk perception toward the product.

When observing the output, we can see a negatively relationship (-.147) between brand trust and risk perception, which indeed, is significant ($p < 0.05 = 0.038$). Therefore, the null hypothesis is rejected, so we assume an inverse relationship between both. Hence, it can be said that, as brand trust increases in 1 unit, risk perception decreases in .147 units.

5.5.3 Hypotheses 3: Brand familiarity and risk perception

The hypothesis that relates brand familiarity and risk perception has been formulated (Table 2) as follows:

H₃: The higher the familiarity with a brand, the lower the risk perception toward the product.

When looking at the coefficients in the Table 13, we can see a negative (-.295) and significant ($p < 0.05 = 0.00$) relationship between brand familiarity and risk perception. Hence, we have to reject H_0 , assuming –again– an inverse relationship between both variables. Thus, when brand familiarity increases in 1 unit, the risk perception toward the product will be reduced in .295 units.

5.5.4 Hypotheses 4 & 5: Brand familiarity, brand trust, warranty and risk perception

In the chapter 3, the relationship between warranty and risk perception, moderated by brand elements, was exposed through the next two hypotheses:

H₄: The higher the trust toward a brand, the more negative the effect of the warranty length on the product's risk perception.

H₅: The higher the familiarity with a brand, the more negative the effect of the warranty length on the product's risk perception.

Based on the output extracted from the linear regression analysis (Table 13), it can be easily observed that both, the moderator effect of trust brand ($p > 0.05 = 0.708$) and brand familiarity ($p > 0.05 = 0.258$) in the relationship between warranty and risk perception, is not significant. Hence, the null hypotheses cannot be rejected, and we cannot state that brand elements can moderate the expected effect in the H₁. In other words, brand trust and brand familiarity do not increase/moderate the effect of warranty length in risk perception.

5.5.5 Hypotheses 6: Risk perception and purchase intention

The next hypothesis was developed (Table 2) about the relationship between risk perception and purchase intention:

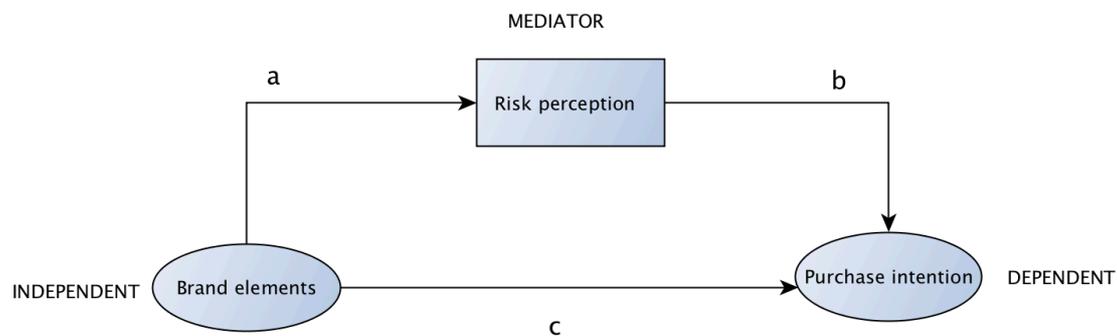
H₆: The lower the risk perception toward a product, the higher the product's purchase intention.

As deeply mentioned, risk perception is the mediator between all the variables analysed above, and the final purchase decision of the product. Therefore, with this hypothesis it is wanted to check if risk perception does finally have any effect in the purchase decision process. When looking at the output in the Appendix E, it can be seen a negative (-.446) and significant ($p < 0.05 = 0.00$) relationship between both variables ($R^2 = .296$). Hence, we can conclude that a decrease in one point in the risk perception increases the purchase decision in .466 points.

5.6 Risk perception as an indirect mediator of brand elements on purchase intention.

By looking at the output extracted from linear regression (Table 13), it is easy to deduce that the effect of both brand elements in the dependent variables (i.e purchase intention) might be mediated by a third variable: risk perception. To test whether this mediation occurs, I have conducted the bootstrap test of the indirect effect $a \times b$ (showed in the Illustration 5), by running the Preacher-Hayes script in SPSS.

Illustration 5: Framework of Hypothesis 7 for risk perception’s mediation.



As seen in the illustration above, there are three main effects: a (effect of the IV on the mediator), b (effect of the mediator on the DV) and c (direct effect of the IV on the DV). To demonstrate an actual mediation effect, we just need to test whether the “ $a \times b$ ” effect is significant and, if so, what is it.

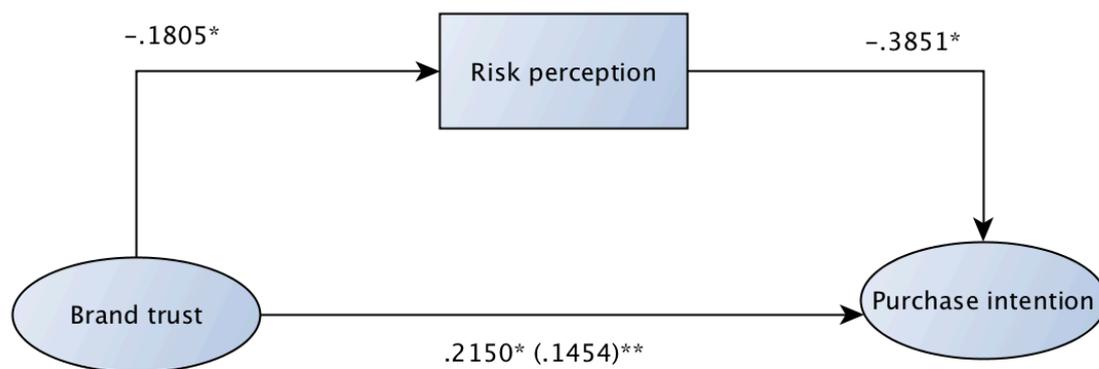
5.6.1 Brand Trust

To make sure there is a mediation effect, we need to look at the “confidence intervals” (see Appendix G), and check that both levels are above 0. As we can observe, the lower (.0221) and upper (.1459) levels are above 0, hence we can conclude that there is a significant indirect mediator effect in this case. When looking at the Illustration 6, we can see that an increase of 1 unit in brand trust will lead to a decrease in .1805 in risk

perception (“a” effect). At the same time, decreases in 1 unit in risk perception will cause increases in the purchase intention of .3851 (“b” effect). At last, there is also a significant direct effect (.2150) of brand trust on purchase intention, which is reduced (.1454) when the mediator is introduced in the model. On the other hand, based on the “indirect effect of IV on DV through proposed mediators”, and having into account the mediator effect of risk perception, it can be observed that the total indirect effect of brand trust on purchase intention is .0695.

By following the paper from Zhao et.al (2010), since “a x b x c” is positive, we can conclude that there is a Complementary Mediation, where “a x b” and “c” are significant.

Illustration 6: Framework of Hypothesis 7 for risk perception’s mediation.



* $p < .05$ (Note: all the elements are significant)

** c' : value when the mediator is in the model

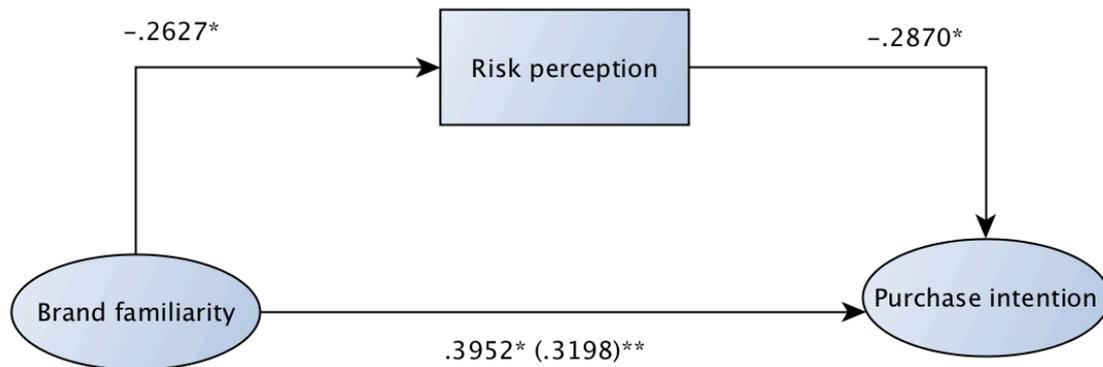
5.6.2 Brand Familiarity

By observing the confidence intervals (Appendix G), we can see that the lower (.0082) and upper (.1649) levels are above 0, hence we can conclude that there is a significant indirect effect. In addition, the Illustration 7 shows that an increase of 1 unit in brand familiarity will lead to a decrease in .2627 in risk perception (“a” effect). On the other hand, increases in 1 unit in risk perception will generate decreases in the purchase intention of .2879 (“b” effect). Finally, there is also a significant direct effect (.3952) of brand familiarity on purchase intention, which is diminished (.3198) when the mediator is introduced in the model. Moreover, based on the “indirect effect of IV on DV

through proposed mediators” showed in the Appendix G, it can be seen that the total indirect effect of brand trust on purchase intention is .0754.

At last, again, since “a x b x c” is positive, we can conclude that there is a Complementary Mediation, where all the paths (a, b and c) are significant.

Illustration 7: Indirect effect of Brand Familiarity on Purchase Intention through Risk Perception



* $p < .05$ (Note: all the elements are significant)

** c' : value when the mediator is in the model

6. Discussion

In this chapter it is going to be talked about the empirical findings of this work, along with their possible applications to the real market. In addition, I will also delve into the limitations and suggestions for future researches.

6.1 Summary of the main findings

This work studies the effect of warranty length's changes in the perception of risk and purchase intention, with two main players: brand trust and familiarity. In addition to the relationship between warranty and risk perception, it was also assumed a direct relationship between both brand elements and the perception of risk. By looking at the previous chapter, it can be seen that there are no significant changes in risk perception, when the manipulated variable (warranty) goes from the low (i.e 2 years) to the high (i.e 6 years) level. In other words, warranty does not have any significant effect neither in the perception of risk, nor in the purchase intention of the product. In fact (as seen in the Appendix H), after testing whether the effect of warranty length on purchase intention was mediated by brand elements –by using the bootstrap test of indirect mediation-, we can observe that both confidence intervals have the 0 value. Therefore, it can also be concluded that brand elements do not moderate significantly the effect of warranty length on risk perception, so it is obvious that warranty is not as important marketing cue as expected.

Nevertheless, it was actually found a significant relationship between brand trust (-.147), brand familiarity (-.295) and risk perception. It leads us to think that both brand elements are relevant during the purchase process, by significantly reducing the risk associated to a given option, and increasing the probability to purchase it. At last, it was also demonstrated a direct and negative (-.446) relationship between risk perception and purchase intention. That finding reveals that risk perception might be a mediator between brand elements and purchase intention, what was demonstrated later on.

As mentioned, after running the bootstrap test for indirect mediation, it was found risk perception to be an indirect mediator of the effect of brand trust and familiarity on purchase intention. Actually, brand trust (-.1805) and brand familiarity (-.2627) have a negative and significant effect on risk perception, which also affects the purchase decision in the same way (-.3851 and -.2870, respectively).

In sum, it can be highlighted the important role of risk perception in the relationship between both brand elements and the final purchase decision. Therefore, this finding let us know that (1) brand elements can be important marketing cues when trying to reduce an offer's risk perception and (2) risk perception is strongly wired to the probability to purchase the product.

6.2 Managerial applications

The findings of this work can give managers valuable insights to improve their brand strategy, and create a long-term relationship with their customers. Therefore, based on the findings, it is going to be explained what the applications to the real market are, and how the brand-product strategy of a company could be enhanced. Brand elements are an important marketing cue to allow consumers to infer some untouchable characteristics, like car's quality, and develop an opinion toward the product. Having the confidence of the relative importance of those marketing cues, among others, enables managers to focus on those elements that are more important to consumers when making risky decisions. Hence, being aware of the importance of brand trust and familiarity to infer in the probability of purchase of a consumer is very important to start building a strategy. In summary, allocating resources to the brand strategy, in order to increase consumers' brand trust and familiarity, will lead to a diminution of the risk perception, and an increase of the likelihood of purchase a given product.

6.3 Limitations and future researches

As deeply mentioned, warranty does not play a significant role in the model, since it has no effect in the risk perception and the purchase decision of the product offered. That might have been due to the fact that the warranty length was among the other characteristics of the product, without being highlighted in any way (what might have better called the respondents attention). Hence, it might be that people did not even realise of the length of the warranty, or it was not important enough to reduce the risk associated to the purchase. On the other hand, the fact of using real brands in the study might also lead to the non-effect of warranty in the model, since consumers already had insights about the lifetime of the product.

It has previously demonstrated that warranty is an important cue to reduce the risk perception (Shimp & Bearden, 1982). Therefore, it has to be thought that either the way it was presented to the consumers was not the right one (e.g. it could have been presented with bigger font, to catch their attention), or the use of real brands biased the study, by equivocally assuming that consumers did not have any perception about the product's lifetime.

Secondly, when running the test for indirect mediation, there was a significant relationship between brand elements and purchase decision, even when the mediator was in the model. This tells us that it might be needed another mediator in the model, since the perfect scenario is present when the mediator cancels the relationship between the independent and dependent variable out, being that a total indirect mediation. In other words, it might be missing another variable in the model, which acts as a mediator between the brand elements and the purchase decision.

Third, to gather the data needed to do the experiment, I asked to "car-experts" and "non-experts" people to answer the questions related to the study. As might be expected, not everyone had enough information about the product (i.e. high-end car models) to make an informed choice. The fact of facing a product, which is not familiar/interesting, might have caused some bias in the data, which could have been reduced by just targeting people who already knew the brands and products well.

Fourth, some of the questionnaire's questions (Appendix A) were inverse, to make sure people did not answer randomly to save time. Even though it was noted before every question what every scale meant, it might have occurred that some people misunderstood the meaning of the questions, or even the scale they were facing. In sum, the items chosen to calculate risk perception could have been difficult to fully understand to respondents, what made me think that other item-scale could have avoid unnecessary bias.

At last, the sample used in the research was N=180 respondents, which is 30 subjects per experiment. That is a fair number to be able to obtain results, but it is always better to amplify the scope to gather as much information as possible. Hence, with a bigger sample, it might be obtained some additional information.

In sum, for future researches it is recommended to avoid the limitations mentioned, and focus on the study of warranty, by changing the way of present it, trying to avoid previous perceptions of the product, and making sure respondents pay close attention to the offer presented.

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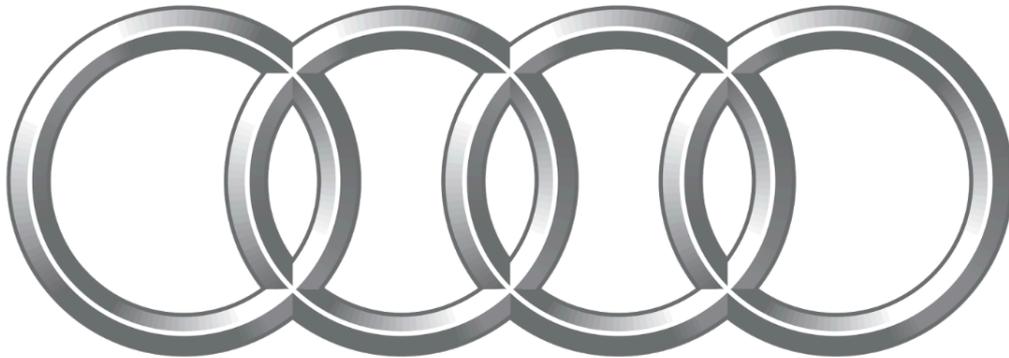
Appendix A: Questionnaire sample: low warranty level (Audi)

Automobile's purchase

Hi!

Assume that you are considering to purchase a new car. Here's an offer that you receive from the dealer. Read the description of the car and answer the questions that follow.

Thanks in advance!



Audi

The brand used in this survey will be AUDI.

1. Rank from 1 (Entirely Disagree) to 7 (Entirely Agree) how much do you agree with the next statements related to Audi. *

Marca solo un óvalo por fila.

	Entirely Disagree	Mostly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Mostly Agree	Entirely Agree
I trust this brand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I rely on this brand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This is an honest brand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This brand is safe	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Audi's familiarity

Now, I want to know the extent to which you feel you have enough information to make an informed judgment about whether or not to make a selection; and the previous experience you had with Audi.

2. How much experience do you have with Audi? (e.g if you choose 1 you are saying you do not have any previous experience with Audi) *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
No previous experience	<input type="radio"/>	A lot of experience						

3. How much information do you have about Audi? (e.g if you choose 1 you are saying you have a lot of great information about Audi). *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
A lot of great information	<input type="radio"/>	No information						

4. How familiar are you with Audi? (e.g if you choose 1 you are saying you are not familiar with Audi). *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Unfamiliar	<input type="radio"/>	Familiar						

Dealer's offer

The car offered is a middle-class Audi with the next specifications:

- Price: 26,000€
- Warranty length: 2 years
- Horsepower: 120 hp
- Fuel consumption: 5 liters/100km

*Now, ask the next questions related to the offer proposed.

5. How certain are you that it would work satisfactorily? *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Uncertain	<input type="radio"/>	Certain						

6. Considering the investment involved, for you to purchase it would be... *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Not risky at all	<input type="radio"/>	Very risky						

7. From this purchase, I would get my money's worth. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Totally true	<input type="radio"/>	Not true						

8. How protected do you feel in case of future faults? *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Protected	<input type="radio"/>	Unprotected						

9. How much would you feel safe with your choice? *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Not safe	<input type="radio"/>	Totally safe						

10. How likely are you to purchase this option? *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Very unlikely	<input type="radio"/>	Very likely						

Questions about you!

Now, the last questions to know you a bit better!

11. **What is your age-range? ***

Marca solo un óvalo.

- Under 18
 18-25
 35-45
 Over 45

12. **Choose your gender ***

Marca solo un óvalo.

- Female
 Male

13. **What is your income range?***

**Remember that this information will be anonymous*

Marca solo un óvalo.

- No income
 Under 10,000€ a year
 10,000-15,000€ a year
 15,000-25,000€ a year
 25,000-35,000€ a year
 Over 35,000€ a year

For you, buying a car is...

Rank the next items related with your involvement during the car's purchase process.

14. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Important	<input type="radio"/>	Unimportant						

15. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Boring	<input type="radio"/>	Interesting						

16. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Relevant	<input type="radio"/>	Irrelevant						

17. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Exciting	<input type="radio"/>	Unexciting						

18. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Means nothing	<input type="radio"/>	Means a lot to me						

19. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Appealing	<input type="radio"/>	Unappealing						

20. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Fascinating	<input type="radio"/>	Mundane						

21. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Worthless	<input type="radio"/>	Valuable						

22. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Involving	<input type="radio"/>	Uninvolving						

23. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Not needed	<input type="radio"/>	Needed						

Thank you for your time!

Appendix B: SPSS output sample description

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	77	42.5	42.8	42.8
	1	103	56.9	57.2	100.0
	Total	180	99.4	100.0	
Missing	System	1	.6		
Total		181	100.0		

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	.6	.6	.6
	2	123	68.0	68.3	68.9
	3	17	9.4	9.4	78.3
	4	39	21.5	21.7	100.0
	Total	180	99.4	100.0	
Missing	System	1	.6		
Total		181	100.0		

Income					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	58	32.0	32.2	32.2
	2	50	27.6	27.8	60.0
	3	20	11.0	11.1	71.1
	4	21	11.6	11.7	82.8
	5	10	5.5	5.6	88.3
	6	21	11.6	11.7	100.0
	Total	180	99.4	100.0	
Missing	System	1	.6		
Total		181	100.0		

Appendix C: Principal components analysis

Brand trust

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.855
Bartlett's Test of Sphericity	Approx. Chi-Square	694.0
	df	54
	Sig.	.000

Communalities

	Initial	Extraction
Trust	1.000	.912
Rely on	1.000	.789
Honest	1.000	.843
Safe	1.000	.878

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.421	85.522	85.522	3.421	85.522	85.522
2	.286	7.150	92.672			
3	.183	4.564	97.237			
4	.111	2.763	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component
	1
Trust	.955
Rely on	.888
Honest	.918
Safe	.937

Extraction Method: Principal Component Analysis. 1 components extracted.

Brand familiarity

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.524
Bartlett's Test of Sphericity	Approx. Chi-Square	115.375
	df	3
	Sig.	.000

Communalities

	Initial	Extraction
Experience	1.000	.809
Information	1.000	.136
Familiarity	1.000	.799

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.744	58.124	58.124	1.744	58.124	58.124
2	.937	31.242	89.365			
3	.319	10.635	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component
	1
Experience	.899
Information	.369
Familiarity	.894

Extraction Method: Principal Component Analysis. 1 components extracted.

Brand trust and familiarity

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.802
Bartlett's Test of Sphericity	Approx. Chi-Square	833.189
	df	21
	Sig.	.000

Communalities

	Initial	Extraction
Trust	1.000	.914
Rely on	1.000	.789
Honest	1.000	.843
Safe	1.000	.876
Experience	1.000	.827
Information	1.000	.125
Familiarity	1.000	.805

Extraction Method: Principal Component Analysis

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.666	52.370	52.370	3.666	52.370	52.370
2	1.514	21.629	73.999	1.514	21.629	73.999
3	.934	13.341	87.340			
4	.327	4.669	92.008			
5	.281	4.013	96.022			
6	.171	2.440	98.462			
7	.108	1.538	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component	
	1	2
Trust	.926	-.240
Rely on	.878	-.135
Honest	.899	-.188
Safe	.905	-.239
Experience	.389	.822
Information	.259	.242

Familiarity	.440	.782
-------------	------	------

Extraction Method: Principal Component Analysis. 1 components extracted.

Risk perception

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.521
Bartlett's Test of Sphericity	Approx. Chi-Square	24.384
	df	3
	Sig.	.000

Communalities		
	Initial	Extraction
Work well	1.000	.127
Risky	1.000	.625
Money's worth	1.000	.631
Extraction Method: Principal Component Analysis.		

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.383	46.113	46.113	1.383	46.113	46.113
2	.961	32.048	78.160			
3	.655	21.840	100.000			
Extraction Method: Principal Component Analysis.						

Component Matrix^a	
	Component
	1
Work well	.356
Risky	.791
Money's worth	.794

Extraction Method: Principal Component Analysis. 1 components extracted.

Appendix D: SPSS output one-way ANOVA and linear regression for dependent variable “risk perception”

Descriptives

Risk_perception								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
2 years	90	3.31481481	.992306373	.104598276	3.10698027	3.52264936	1.00000000	5.33333333
6 years	90	3.49629630	.967956578	.102031582	3.29356172	3.69903088	1.00000000	6.00000000
Total	180	3.40555556	.981691493	.073170964	3.26116690	3.54994422	1.00000000	6.00000000

Test of Homogeneity of Variances

Risk_perception			
Levene Statistic	df1	df2	Sig.
.853	1	178	.357

ANOVA

Risk_perception					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.482	1	1.482	1.543	.216
Within Groups	171.023	178	.961		
Total	172.506	179			

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.816	.553		8.705	.000
	Brand_Trust	-.147	.070	-.246	-2.088	.038
	Brand_Familiarity	-.295	.076	-.423	-3.906	.000
	Gender	.066	.139	.034	.477	.634
	Income	.019	.040	.033	.468	.640
	Warranty	-.454	.534	-.232	-.851	.396
	Involvement	.085	.094	.062	.904	.367
	Warranty_trust	.034	.089	.096	.375	.708
	Warranty_familiarity	.116	.102	.261	1.134	.258

a. Dependent Variable: Risk_perception

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.456a	.208	.166	.8966160202	1.980
a. Predictors: (Constant), Warranty, Risk_perception					
b. Dependent Variable: Purchase					

Appendix E: SPSS output linear regression for dependent variable “purchase intention”

Descriptive

Descriptive Statistics			
	Mean	Std. Deviation	N
Purchase	4.17	1.599	180

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.296a	.087	.077	1.536	2.088
a. Predictors: (Constant), Warranty, Risk_perception					
b. Dependent Variable: Purchase					

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.041	2	20.020	8.485	.000
	Residual	417.620	177	2.359		
	Total	457.661	179			
a. Dependent Variable: Purchase						
b. Predictors: (Constant), Warranty, Risk_perception						

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.833	.422		13.834	.000
	Risk_perception	-.446	.117	-.274	-3.796	.000
	Warranty	-.286	.230	-.090	-1.243	.216
a. Dependent Variable: Purchase						

Appendix F: Differences between brands among variables

ANOVA for brand trust and familiarity

ANOVA						
		Sum of Sqr	df	Mean Sqr	F	Sig.
Brand Trust	Between Groups	3.108	2	1.554	.568	.568
	Within Groups	484.442	177	2.737		
	Total	487.550	179			
Brand Familiarity	Between Groups	10.238	2	5.119	2.637	.074
	Within Groups	343.546	177	1.941		
	Total	353.785	179			

ANOVA for risk perception and purchase intention

ANOVA						
		Sum of Sqr	df	Mean Sqr	F	Sig.
Risk perception	Between Groups	3.293	2	1.646	1.722	.182
	Within Groups	169.213	177	.956		
	Total	172.506	179			
Purchase intention	Between Groups	.544	2	.272	.105	.900
	Within Groups	457.117	177	2.583		
	Total	457.661	179			

Appendix G: Risk perception as an indirect mediator of brand elements on purchase intention.

Brand Trust

```

Dependent, Independent, and Proposed Mediator
Variables:
DV = Purchase
IV = Brand_Tr
MEDS = Risk_per

Sample size
      180

IV to Mediators (a paths)
      Coeff      se      t      p
Risk_per  -.18053  .0425  -4.2496  .0000

Direct Effects of Mediators on DV (b paths)
      Coeff      se      t      p
Risk_per  -.3851  .1219  -3.1596  .0019

Total Effect of IV on DV (c path)
      Coeff      se      t      p
Brand_Tr  .2150  .0708   3.0356  .0028

Direct Effect of IV on DV (c' path)
      Coeff      se      t      p
Brand_Tr  .1454  .0725   2.0056  .0464

Model Summary for DV Model
      R-sq  Adj R-sq      F      df1      df2
p
.1000    .0898    9.8315    2.0000    177.0000
.0001

*****
*****

```

³ Green shading points out to significant coefficients and confidence intervals

BOOTSTRAP RESULTS FOR INDIRECT EFFECTS

Indirect Effects of IV on DV through Proposed Mediators (ab paths)

	Data	Boot	Bias	SE
TOTAL	.0695	.0699	.0003	.0312
Risk_per	.0695	.0699	.0003	.0312

Bias Corrected Confidence Intervals

	Lower	Upper
TOTAL	.0221	.1459
Risk_per	.0221	.1459

Level of Confidence for Confidence Intervals:
95

Number of Bootstrap Resamples:
5000

Brand Familiarity

Dependent, Independent, and Proposed Mediator Variables:

DV = Purchase

IV = Brand_Fa

MEDS = Risk_per

Sample size
180

IV to Mediators (a paths)

	Coeff	se	t	p
Risk_per	-.2627	.0485	-5.4177	.0000

Direct Effects of Mediators on DV (b paths)

	Coeff	se	t	p
--	-------	----	---	---

```

Risk_per      -.2870      .1220      -2.3525      .0197

Total Effect of IV on DV (c path)
      Coeff      se      t      p
Brand_Fa      .3952      .0799      4.9440      .0000

Direct Effect of IV on DV (c' path)
      Coeff      se      t      p
Brand_Fa      .3198      .0852      3.7536      .0002

Model Summary for DV Model
      R-sq      Adj R-sq      F      df1      df2
p      .1474      .1378      15.3001      2.0000      177.0000
.0000

*****
*****

```

BOOTSTRAP RESULTS FOR INDIRECT EFFECTS

```

Indirect Effects of IV on DV through Proposed
Mediators (ab paths)
      Data      Boot      Bias      SE
TOTAL      .0754      .0746      -.0008      .0394
Risk_per      .0754      .0746      -.0008      .0394

Bias Corrected Confidence Intervals
      Lower      Upper
TOTAL      .0082      .1649
Risk_per      .0082      .1649

*****
*****

Level of Confidence for Confidence Intervals:
95

Number of Bootstrap Resamples:
5000

***** NOTES
----- END MATRIX -----

```

Appendix H: Brand elements as indirect mediators of warranty length on purchase intention.

Dependent, Independent, and Proposed Mediator Variables:

DV = Purchase
 IV = Warranty
 MEDS = Brand_Tr
 Brand_Fa

Sample size
 180

IV to Mediators (a paths)

	Coeff	se	t	p
Brand_Tr	-.4611 ⁴	.2443	-1.8876	.0607
Brand_Fa	.1667	.2098	.7944	.4280

Direct Effects of Mediators on DV (b paths)

	Coeff	se	t	p
Brand_Tr	.1103	.0712	1.5496	.1230
Brand_Fa	.3664	.0829	4.4229	.0000

Total Effect of IV on DV (c path)

	Coeff	se	t	p
Warranty	-.3667	.2374	-1.5442	.1243

Direct Effect of IV on DV (c' path)

	Coeff	se	t	p
Warranty	-.3769	.2250	-1.6754	.0956

Model Summary for DV Model

	R-sq	Adj R-sq	F	df1	df2
p	.1508	.1363	10.4171	3.0000	176.0000
	.0000				

⁴ Red shading points out to non significant coefficients and confidence intervals

BOOTSTRAP RESULTS FOR INDIRECT EFFECTS

Indirect Effects of IV on DV through Proposed Mediators (ab paths)

	Data	Boot	Bias	SE
TOTAL	.0102	.0121	.0018	.1016
Brand_Tr	-.0508	-.0503	.0006	.0410
Brand_Fa	.0611	.0623	.0013	.0848

Bias Corrected Confidence Intervals

	Lower	Upper
TOTAL	-.1981	.2350
Brand_Tr	-.1726	.0025
Brand_Fa	-.0861	.2678

Level of Confidence for Confidence Intervals:
95

Number of Bootstrap Resamples:
1000

***** NOTES

----- END MATRIX -----