**Thesis**

### MASTER THESIS MARKETING MANAGEMENT/MARKETING ANALYTICS FALL 2022

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*1 Chapter – Introduction*

* 1. *Problem indication*

Nowadays the circular economy concept has taken place on the agenda of some countries in order to face some environmental, social and economic set of challenges. According to Lacy et al (2020), the circular economy is a system which has a set of rules aiming to disunite the economic growth from the consumption of scare resources. One of the new business models produced by the circular economy is the one known as Product-as-a-service (PaaS). In this model the customers are not the owners of the product, rater they rent or lease it.

This new context, in accordance with Morewedge et al (2021), will produce important changes in consumption through the replacement of legal ownership of private goods with legal access to goods and services owned and used by others. Psychological ownership, among other items, were included in the “bundle of rights” provided by the legal ownership (Morewedge 2020).

Psychological ownership can be understood as a form of emotional attachment between consumers and the goods and services they use (Shu & Peck, 2011). Within this new context, psychological ownership could be threatened by the changes in consumption given that legal ownership, as it was described previously, has been the main source of it in the traditional model (Morewedge et al., 2021). But at the same time, it represents a challenge for companies in order to find new alternatives, that allow to protect or even boost this emotional link between users and products.

Psychological ownership is a relevant variable that deserves to be borne in mind by companies because it has important influence on both approaches: for the consumers and for the companies as well. According to Li & Atkinson (2020), psychological ownership fulfills basic psychological needs and therefore increments customer well-being. Additionally, this variable is positively associated with consumer demand, willingness to pay, word of mouth and competitive resistance (Morewedge et al., 2021), variables that are quite linked with the performance of companies in the short, mid and long term.

One of the alternatives proposed by Morewedge et al (2021) to preserve psychological ownership is through customization. It has a great potential to retain psychological ownership, this statement could be confirmed by the research made by Arora et al (2021) which found that 71% of consumers expect companies to deliver personalized experiences and 76%, of them, get frustrated when this does not happen. Additionally, in accordance with Teasdale (2022) 33% of consumers interested in customization feel that standard products do not meet their expectations. There are important opportunities for companies to enhance customization experiences, offered to their clients, as a replacement of legal ownership.

Customization occurs when the user indicates the computer what he or she prefers to see, for instance through changing an automobile vendor’s site to display a particular car model with specific color and feature options. Customization could lead to several benefits such as: increment of loyalty, reduction of operational costs or widening the net (Nielsen, 2009). However, at the same time, misunderstandings in regard to what, specifically, about the product could be customizable can lead to lost sales (Cardello & Nielsen).

With the appearance of the internet, the customization services provided by companies have increased sharply, for this reason nowadays it is more appropriate to talk about mass customization rather than just customization. Mass product customization is much more difficult than providing customization in goods towards a reduced consumer group. The first step to ensure the product’s success is assembling the customer specification (Roy, 2021).Nowadays, companies are trying to embrace mass customization in an attempt to provide unique value to their customer; nevertheless, many managers at these companies have discovered that mass customization can produce unnecessary costs and complexity (Pine & Gilmore, 1997).

Customizing a product by each attribute tends to be onerous for consumers. As a result, the benefits produced by product customization could be countered by an increase in choice complexity, leading to a decrease of customer satisfaction along with other relevant variables as well (Hildebrand et al., 2014). Due to the high level of complexity around mass customization, it is fundamental to address the specific customers desires, within a customization context, in order to make the whole process simpler. Product customization necessities should be led by some determined factors such as the market demand, innovation, the value provided to the customers and the niche market the product is targeted to (Roy, 2021).

Research has been able to prove that companies have been struggling to achieve cost improvements promised by mass customization. This could be produced by the pressure, faced by companies, to deliver customized and affordable products (Wiengarten et al., 2017). Cost increase, in a customization context, could be produced by the maintenance of a variety of machinery and infrastructure that can produce different product, color, shapes, etc (Global Electronic Services, 2022). The tools and technologies required to reach mass customization at low cost are not accessible easily yet. There is no specialized infrastructure that offer access to all the capabilities of mass customization (Roy, 2021).

From the previous stated problem indication, it is believed that companies, in an attempt to offer a very wide variety of options for their customers in order to customize products, they are adding, unconsciously, complexity and unnecessary costs to the whole process. For this reason, organizations, which offer product customization, could consider to narrow the variety available for users in order to just include the specific type and number of features, to customize, that the customers are actually looking for.

In order to manage this complexity and unnecessary costs, it is proposed that companies should focus their efforts in order to identify the type of features that are the most appealing for user when customization is an available option for them. The negative effects of complexity on mass customization are lower for expert consumers (Dellaert & Stremersch, 2005). It is believed that this “expert consumers” are more associated with technical or utilitarian features while average consumers are linked with more visual or hedonic features. Based on the previous statement, it is considered that utilitarian features will have a significant difference with hedonic ones in customization contexts.

Customization studies have been able to reveal that in fact, customers designing their own products might be willing to pay premium prices (Schreier, 2006). But an important detail that has not been deepened enough is the preferred level of customization available for consumers. After all, as it has just been mentioned before, a product with a high level of features to be customized, also could be seen as a complex task.

Despite of the importance of the psychological ownership and the potential of customization to protect it, companies nowadays are not well enough oriented in the search of the level and type of features that are the most appealing for customers at the time of customizing the products that will be used by them. These findings could be fundamental in order to strength psychological ownership and maximize the perceived value of the products customized by users even if these are not owned by them. The overall purpose of this research is to contribute to find answers to the problems, questions and uncertainties described above. This is expected to be achieved through the research which will enable us to determine if the level and type of features to customize products could have an impact on willingness to pay and also if this relationship is explained by the emotional link, between users and modified products, called psychological ownership.

* 1. *Problem statement*

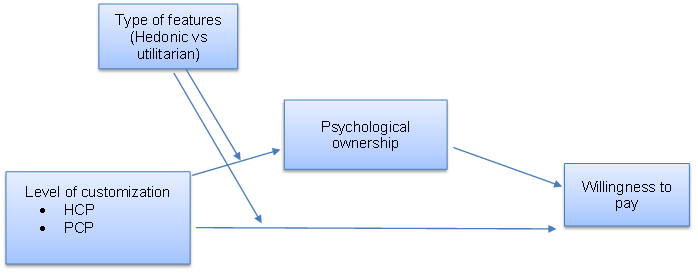
*To what extent is the relationship between level of customization and willingness to pay explained by psychological ownership, and what is the moderating role of type of features used to customize products on the relationships between level of customization and both; willingness to pay and psychological ownership?*

* 1. *Research questions*
     1. *Theoretical research questions*

Supported by the literature review, the theoretical research questions that are expected to be answered are:

* What is psychological ownership?
* What is product customization?
* What is a hedonic feature?
* What is a utilitarian feature?
* What is highly customizable product?
* What is a poor customizable product?
  + 1. *Empirical research questions*

Supported by an experimental design the empirical research questions that are expected to be answered are:

* To what extent is the willingness to pay affected by the level of customization on a product?
* To what extent is the psychological ownership affected by the level of customization on a product?
* To what extent is the relationship between willingness to pay and level of customization moderated by the type of features used to customize products?
* To what extent is the relationship between psychological ownership and level of customization moderated by the type of features used to customize products?
* To what extent does psychological ownership have a mediating role in the relationship between the level of customization and willingness to pay?
  + 1. *Conceptual model*

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* 1. *Research method*

In order to give an answer to the problem statement and the research questions mentioned above a literature review and an online experiment will be carried out. The literature review will contribute to define the main the key concepts that are encompassed by this research. Additionally, it will help us to understand how the variables included are related to each other, based on previous research done; that, at the same time will support the hypotheses which are going to be eventually stated.

The experiment will include two treatment variables, each variable will have 2 conditions; therefore, it is going to be an 2x2 online between subject design experiment. The respondents will be randomly assigned to each of the 4 experimental conditions and will be able to customize a car based on the conditions given. Afterwards they will be required to fill out a questionnaire that will be used as a guide to measure the psychological ownership. Finally, they will be asked to give their willingness to pay towards the customized product.

* 1. *Relevance*

### The conceptual model depicted above, has been developed with the aim to offer a customization framework in order to determine, through an emotional and economical approach, which are the most appealing type of features (utilitarian vs hedonic) for users when product customization is an alternative available for them. Additionally, it is intended to show the effect of level of customization on both, psychological ownership and willingness to pay. Finally, it is desired to determine the degree to which this emotional link (psychological ownership) explains the relationship between customization and the economic value ascribed to a physical customized good (willingness to pay).

* + 1. *Academic relevance*

From an academic approach, this research could be relevant for several reasons. The main of them is that this study tries to test and develop a model based on one of the suggestions made by Morewedge et al., (2021) where the customization was proposed as a replacement of legal ownership as a response to the changes in consumption produced by the circular economy. Although the importance of this proposal, it has not been tested through an experimental design approach or not at least in the way how has been designed in this study.

Second, as it was mentioned before, customization studies have been able to reveal that in fact, customers designing their own products might be willing to pay premium prices (Schreier, 2006); however, this literature fails to determine if psychological ownership is a variable that explains why customers tend to pay higher prices for customized goods. The present research dives deeply in the effects of customization on psychological ownership and on the willingness to pay for products modified by users.

Third, although utilitarian and hedonic conditions have been manipulated in other studies such as the one made by Dhar & Wertenbroch (2000), what makes this research different is that thses conditions will be used as a features rather than product types. Aditionally it is going to be measured its impact in a customization context which will lead us to determine what are the favorite type of features used to modify products. This answers has not been given yet by the current literature.

* + 1. *Managerial relevance*

From a managerial approach this research could also give relevant contributions. The first of these is based on the challenge identified by Hildebrand et al (2014) who stated that customization could increase choice complexity due to the huge number of options offered and the high variability and diversity of customer preferences; therefore, it is important for companies to offer just the options that are the most appealing for customers when product customization is an option available for them. After all, consumers tend to defer choice when the choice environment becomes more complex (Swait & Adamowicz, 2001).

Customization is a way to offer a unique and differentiated proposition to customers. But part and product complexity comes at a price which could be harsh to measure, with hidden cost flying under the radar (Chaudhury et al., 2021). Given the previous statement, it is believed that strategically narrowing the options offered to users at the time to customize a product could be a painkiller in order to deal with issues related with operational costs, produced by the desire of companies to satisfy the high variety and diversity of customer preferences in customization context. This study intends to present a framework which lead to know which are the most appealing type of features and degree of customization for users. Through this approach it is expected to achieve this strategic narrowing.

* 1. *Structure of the thesis*

This thesis is divided in 5 chapters. The introduction is presented in the first one. In the second and third the theoretical framework and the methodology respectively, are discussed. The chapter four contains the obtained results and the analysis of those. Finally, chapter five include the conclusion of the research, the managerial implications and the limitations and future research as well.

1. *Chapter – Theoretical framework*

In this chapter the hypotheses regarding the present study will be stated. A theoretical background will be developed in order to sustain the hypotheses. Following this purpose, a literature review will be carried out to explain the key concepts, of the conceptual model, and draw connections between them. This will be done with the aim of comparing and critically assessing previous theories, elaborated by other authors (Vinz, 2015), related with the main concepts and subjects of this research.

* 1. *Main effect – Level of customization*

According to Lee & Kim (2020) customization is the process where products are designed from common materials, leading to a feeling of uniqueness for consumers or users. In recent years customization has started to be seen as a relevant marketing strategy driven by increase of supply of technology focused on customization, the declining of production costs and the internet, which enhances the communication with the customers (Franke et al., 2009).

Nowadays it is becoming relevant to market product and services to small niche segments, going further even to customization in order to aim individual preferences (Puligadda et al., 2010). This, in fact, is quite important due to the customers’ demand for customized products has augmented and customers´ desires have become highly heterogeneous in several markets (Franke et al., 2009). The mixture of advanced engineering techniques and information technology gives firms the opportunity to be highly flexible for providing product variety through customization (Dellaert & Stremersch, 2005).

It is important to mention that level of customization has been included, as an independent variable, in this paper, following the contributions made by Schreier (2006) and Franke et al. (2009). Both were aimed to analyze the effect of customization on willingness to pay, but while the first tested it through the comparison of self-design against standard products; the second made it through the assessment of tailored products belonging to several categories. As it has been mentioned before, willingness to pay is a variable positively related with the psychological ownership (Morewedge et al., 2021), therefore it is expected that customization could influence, in the same way as willingness to pay, psychological ownership as well.

Additionally, this research will be influenced by the study carried out by Dellaert & Stremersch (2005). They found that consumers did not perceive a significant increment in product complexity over the rather wide range of modules and module levels manipulated in this study, and they were in fact able to get increased product utility. This is important to consider because initially it was believed that the relationship between level of customization and willingness to pay could be quite obvious; nevertheless, as it was said by Hildebrand et al (2014), customization by individual components could produce an increment in choice complexity and it could lead to the decrease of relevant variables such as product utility or even willingness to pay.

It is important to recall that the effect of customization on willingness to pay has been documented already in the literature however, what makes this research different, is that those researches focused their attention in the comparison between standard products and customized products. This research proposes the contrast between products with a high level of customization and products with a low degree of it.

Retailers who employ techniques of fostering in customers to encouraging product customization, may be able to increase psychological ownership (Shu & Peck, 2011). This statement is completely aligned with the proposal made by Morewedge et al (2021) who affirms that the increased control imbued by improved considerations set and customization may produce a higher level of psychological ownership as well. Although the above declarations have had an important relevance within the customization literature, these have not been proved or tested through an experimental design research approach; therefore, this is one of the key added contributions expected to be given by this present research.

The connection between level of customization and psychological ownership was created due to the influence of a study carried out by (Jami et al., 2021) where ownership was manipulated through the customization of a product. Their results showed that the participants who customize the product for themselves, developed a greater psychological ownership than those who modified it in order to make it more attractive to be purchased by others. Although, in this experiment customization was not a variable itself, rather was a mean to manipulate ownership, it showed that in fact, there could be a relationship between the degree or level of customization and the psychological ownership developed by customers towards products modified directly by them.

Bearing in mind the previous theories, results and statements, the following hypotheses have been proposed:

**H1:** Products with a high degree of customization will produce a higher willingness to pay than products with a low degree of customization.

**H2:** Products with a high degree of customization will develop a stronger psychological ownership, on customers, than products with a low degree of customization.

* 1. *Moderation effect – Type of features used to customize products*

### Products could be seen as bundles of features with their attractiveness determined as a compensatory function of feature levels (Lancaster, 1966). At a fundamental level, the appeal of a product can be viewed as a function of two sets of factors: product features and marketing efforts (Du et al., 2015). Consumers tend to assess products with many features more positive (vs products with few features) because they think that each additional feature gives new capabilities to the product (Irmak & Goodman, 2013).

### A product feature is a component of a product that fulfills a customer need. Feature could influence the pricing strategy and companies modify features to enhance the user experience (Blakely, 2022). Marketing team have an important role in product development and hence in the management of its features. By building product features that consumers want and, at the same time, differentiate it from the competence could be fundamental in order to achieve the sales goals (Nguyen, 2022).

### In accordance with the purposes of this research, type of features used to customize products is going to be classified in two conditions: hedonic and utilitarian. Hedonic features are those linked with a sensory experience of aesthetic or sensual pleasure and fun; while utilitarian attributes are those orientated to a specific goal and with the accomplishment of a practical task (Dhar & Wertenbroch 2000).

### The inclusion of this variable and the development of the hypotheses in this regard, have been done based in the research made by Dhar & Wertenbroch (2000). In this study they were able to demonstrate that participants tend to assign higher value to a hedonic product than to a utilitarian one, through an experiment which asked participants to imagine that they were to sell their car, therefore the minimum selling price should be stated. Additionally, hedonic products trigger more psychological ownership and more positive affect than utilitarian products (Shu & Peck, 2011); moreover, as it was demonstrated by Dhar & Wertenbroch (2000), hedonic products also generate more loss aversion, which at the same time, could be driven or influenced by the emotional attachment (Shu & Peck, 2011) developed by users towards products (psychological ownership).

### As it has been explained, consumers tend to develop stronger emotions towards hedonic products and also, based on the contribution made by Irmak & Goodman (2013), stated previously, which says that consumers usually prefer products with a high number of features, it is possible to infer that products customized with a relative high number of hedonic features will be preferred by the users rather than other type of customization configurations.

### Initially both conditions, utilitarian and hedonic were linked just with the type of product but not directly with the process of customization; however, as it was stated by Broniarczyk & Griffin (2014), nowadays customers have more opportunities to customize products and services to meet their desires, providing a feeling of uniqueness as well as hedonic or experimental benefits related to the process of customizing. This statement confirms that consumers, usually, tend to relate the process of customization with a hedonic feeling.

### The moderating role of the type of features used to customize products, and its two conditions, was proposed based on the research made by Bonaventure & Chebat (2015). This study showed that the type of product variable, and both conditions; hedonic and utilitarian, could have a moderating role. In this research the moderating role is significant in the relationship between touching products and both: willingness to pay and psychological ownership; therefore, it is expected that type of features used to customize products could have a moderating influence in the connection between level of customization and the two previously described variables. Additionally, it is important to bear in mind the suggestion made by Jami et al (2021), who said that retailer can enhance psychological ownership by encouraging consumers to touch products or letting them to customize them.

### H3: Products with a high degree of customization will produce a higher willingness to pay than products with a low degree of customization and this relationship will be stronger for product customized through hedonic features than products customized through utilitarian ones.

### H4: Products with a high degree of customization will develop a stronger psychological ownership, on customers, than products with a low degree of customization and this relationship will be stronger for product customized through hedonic features than products customized through utilitarian ones.

* 1. *Mediation effect – Psychological ownership*

Ownership could be divided in two broad terms, the first is psychological ownership and the second one is legal ownership. According to Li & Atkinson (2020) psychological ownership could be understood as the individual feeling of possession a consumer could hold for a target, it is based on subjective feelings. Legal ownership, on the other hand, is the possession of a product, endorsed by a legal document, usually a deed, a bill or a receipt. Although both concepts are closely related to each other they also can operate separately, specifically psychological ownership can exist without legal ownership (Shu & Peck, 2011), for instance, consumers could develop psychological ownership towards ideas or goods for which they do not have any legal claim (Morewedge et al., 2021).

According to Brown (2018) there are 4 ways to foster psychological ownership in a marketing context. These are: firs, through physical interaction; second, with user-generated content; third, using collaborative content; and last but not least, by means of interactive social media campaigns. This is especially important due to the value-enhancing consequences derived from the psychological ownership which are linked with the traits associated with the self and positive self-associations that are transferred to the good thus, increasing the emotional attachment towards the good, that leads to the enhancement of its perception and value (Morewedge et al., 2021).

Based on the literature review done in order to carry out this research, the mediating effect of psychological ownership on willingness to pay has been already documented. For instance, Atasoy & Morewedge (2017), determined the influence of psychological ownership, as a mediator, between product format (digital vs physical) and product valuation (WTP). Similarly, Bonaventure & Chebat (2015) established in their model the mediating role of psychological ownership in the relationship of touching product with willingness to pay for extended warranties.

In addition, the inclusion of psychological ownership as a mediator variable, was based on the insights found by Shu & Peck (2011). In one of their experiments, they were able to show that in fact, this variable was significantly related with product valuation when the ownership length, towards a specific object, was manipulated. They even went further in their research in order to prove that the independent constructs of psychological ownership can help explain many of the endowment effect findings registered in literature.

As it was stated before, hedonic products tend to develop a stronger psychological ownership that utilitarian ones. As a complement it is important to mention the research made by Norton et al (2012) where it was explained the IKEA effect. This effect states that persons tend to assign a higher product valuation when the good has been ensembled directly by them. In addition, it says that the positive impact of effort on product valuation is likely to happen when the effort ends up in a successful completion of a task. Based on this research, it is believed that products that have been customized, by users, modifying or changing more features, will develop this IKEA effect and therefore will get a higher willingness to pay and psychological ownership as well.

The present research is focused on determining the degree on what psychological ownership explains the effect of customization on willingness to pay for products modified by the potential users. This challenge has not been addressed yet by the current literature so therefore, this is one of the key contributions expected to be given by this present study.

**H5:** Products with a high degree of customization will produce a higher willingness to pay than products with a low degree of customizationand the relationship will be mediated by the psychological ownership

**H6:** Products customized through hedonic features will produce a higher willingness to pay than products customized through utilitarian features and the relationship will be mediated by the psychological ownership

1. *Chapter – Methodology*
   1. *Experiment*

The main target behind this research is to determine the effect of level of customization on willingness to pay and to see if this relationship is explained by the psychological ownership. In additions it is intended to obtain to what extent the type of features used to customize products could have a moderation role between level of customization and both variables: psychological ownership and willingness to pay for a customized product.

Although there are several research approaches that could be adopted in order to test the hypotheses developed so far, the one that suits the best the purpose of the study is the experimental design. Experimental design is the process of carrying out research through an objective and controlled way so the accuracy is incremented as high as possible hence, specific conclusions can be drawn in regards of the hypotheses statements (Bell, 2009). This methodology could be adapted to the main objective of the study because its focus on consumer behavior allows us to manipulate aspects of a stylized artificial scenario and measuring consumer reactions to these hypothetical scenarios (Morales et al., 2017), which are fundamental processes in order to achieve the desired outcome.

Traditionally, in behavioral sciences, there are two types of experiments: the laboratory experiments and the field experiments (Reips, 2000); however, none of these are suitable neither for the methodology nor for the context of this research. These traditional approaches have shown several constrains, at the time to carry out research, that go from problem with the number of participants, to organizational or institutional limitations (Reips, 2000). Based on this, the approach that will be adapted in order to carry out this research is the one based on online experimental design.

Online experiments are behavioral research carried out through the internet. Leading behavioral experiments online, rather than through traditional means, can provided better external validity due to two main reasons: the more ecologically valid context and more participants diversity (Howell, 2022). A big advantage of this novel methodology is that they scale really well due to the fact that recruiting larger enough samples does not demand a high workload and specifically hard-to-reach populations become mote readably accessible (Sauter et al., 2020).

* 1. *Experimental design*

The experimental design approach that will be applied in this research is a between-subject design experiment. This kind of experiment are characterized by the fact that each participant is randomly assigned to each experimental group, (Birnbaum, 2009). On it, different people test each condition; hence, each person is only exposed to an individual user interface (Budiu , 2018). According to Budiu (2018) between-subject studies have shorter sessions, than within-subject designs, and also are easier to set up, especially when you have multiple independent variables, just as how it is for this research.

Given that the research has 2 treatment variables (level of customization and type of features) and each variable has two conditions, the study will have 4 experimental groups. Each participant will be assigned randomly to one of the conditions of the treatment variables. Randomized experiments enable us to scientifically determine the impact of a manipulation on a particular outcome of interest (Yale University, 2022).

The minimum number of participants required in this study is about 256. This quantity was determined through power analysis. In accordance with Cohen (1992) 64 participants are necessary, on each condition, to have a power of at least 80%. Given that this research has 4 experimental conditions, the required number is the one stated above. The respondents will be collected through some online crowdsourcing marketplaces such as MTruk or Prolific Academic. Initially, it was considered to generate the responses through a convenience sampling approach, but while this method could have several advantages, there is one huge downside, which definitely it is desired to avoid, that is homogeneity (Netzer & Bellezza, 2021). The biggest concern regarding the data generated from these platforms is its quality; however, research carried out by Smith et al (2015) showed that the response pattern is quite similar between a sample group drawn from a “regular” online panel and a sample group gathered through one of these marketplaces; both samples belong to the U.S.

* 1. *Manipulation Pre-test*

A pre-test was carried out in order to see if the participants understand the questions asked along the questionnaire and to see if the manipulation strategy was going to be well adapted and comprehended by participants. It is focused on one of the treatment variables which is the type of features used to customize products. This procedure was done based on the research carried out by Dhar & Wertenbroch (2000); in it, they conducted the pre-test to ensure that participants were able to differentiate between hedonic and utilitarian concepts for some pairs of attributes related to some specific choice options. This framework was adapted following the purposes of this study; for it, the respondents were asked to indicate, for some specific car features, if they are related to the hedonic or utilitarian definitions, these definitions were given at the beginning of the procedure. The used scale was 1 being a completely utilitarian feature and 6 being a completely hedonic feature.

The results of the pre-test are depicted in table 1. Low scores (below 3) were produced due to the interpretation of the participants of relating the attribute with the utilitarian definition, while high scores (above 3) were generated given the understanding of the respondents of linking the item with the hedonic concept. So, it is possible to see how a completely utilitarian feature such as the engine of the car has a relatively low score, while a hedonic feature such as the car body design has a relatively high score. These results indicate that the respondents are able to differentiate between the hedonic and utilitarian concepts for vehicle items.

|  |  |  |  |
| --- | --- | --- | --- |
| # | Field | Mean | Std Deviation |
| 1 | The engine of the car | 1.68 | 1.06 |
| 2 | Paint color of the car body | 5.23 | 0.85 |
| 3 | Size of the wheels | 3.23 | 1.04 |
| 4 | Material of the car upholstery | 4.41 | 1.27 |
| 5 | Type of brakes installed in the car | 1.64 | 0.88 |
| 6 | Color of the car interior lights | 4.91 | 1.04 |
| 7 | Fuel tank capacity | 1.73 | 0.86 |
| 8 | Car body design (sedan or hatchback) | 4.09 | 1.31 |
| 9 | Car transmission | 1.77 | 1.08 |
| 10 | Car sunroof | 4.45 | 1.2 |

Table 1: Results of the pre-test

* 1. *Sample*

The selected sample is full-time employees from the U.S with an age range between 25-50 years old. These demographics were selected based on several studies, one of them published by Birkett (2021) who says that people ages 25-54 purchase the most, new vehicles with SUV buyers tending to be a bit older. Additionally, the sample was selected to be in the U.S. based on the data shown by Statista (2022) which indicates that the market for the vehicle in the U.S. is the second largest in the world just behind China.

* 1. *Method*
     1. *Treatments*

At the beginning of the experiment, the participants were shown the same vehicle regardless their experimental assigned condition. The chosen vehicle was a Ford Fiesta 2022, this product was selected based on the fact that Ford is the most popular American brand in the U.S.(Ortiz, 2022) and the chosen model, Fiesta, was selected given that it is one of the most iconic models for the brand based on the fact that the manufacturer has produced it since 1976 with more than 16 million vehicles sold in the U.S., Europe, South America, Australia and Asia (Nowak, 2022).

The experiment consists of two treatments, each with two conditions in it which produce 4 experimental groups. The first treatment is the level of customization; for it, there are two conditions that are a high degree or a low degree. For the high-degree condition, participants were able to customize 10 features of the car, while for the low-degree condition they were able to customize just half of the high-degree condition, 5 features. The number of features to customize, for each group of this treatment, was stated based on the research carried out by Dellaert & Stremersch (2005). In it, they manipulated the number of mass-customizable modules for a personal computer, 4 being for the low-level condition and 8 for the high-level condition.

* + 1. *Measurement of dependent variable and mediator*

Psychological ownership, the mediator, is going to be measured based on a five item-scale developed by Pierce & Van Dyne (2004) and, adopted and suited by other authors in their research like the one carried out by Li & Atkinson (2020). This scale goes from 0 (strongly disagree) up to 7 (completely agree). The measured items are 1. I sense this car is mine; 2. I feel a very high degree of personal ownership towards this car; 3. I feel personally connected to this car; 4. it is hard for me to think about this car as mine; 5. this car does not make me feel that it is mine.

Given that in the present experiment, participants are going to be told that they have to purchase a specific car, rather than sell their own vehicles, they will just be required to give the additional amount of money, in U.S dollars, that they are willing to spend in that specific product, after the whole manipulation was done. Through an open question, respondents will be able to specify their additional willingness to pay for the customized product.

* + 1. *Covariates*

Given that homogeneity is desired in regards of the location of the participants, this is not going to be included as a covariate, rather just 3 variables will be considered. These are: gender, age and mean of transport usually used.

Gender as a covariate has been included based on the study carried out by Arısal & Cömert (2016). This study was able to examine the influence of hedonic and utilitarian motives on consumer behavior through the comparison of two cultures: Spanish and Turkish. In the research, the authors demonstrated that female respondents tended to be more hedonic motivations than male respondents in both countries. Additionally, the study made by Walkcher et al (2016), showed that women are more mass-customized oriented through the analysis of 500 online shops. The data obtained by the authors showed that while 60% of women have already purchased a MC-product online, only 44% of men were MC-users. These findings are quite relevant to expect a significant difference in the present research between both genders.

In regards to age, there are several studies which have documented a significant difference in willingness to pay among some age groups. For instance, the research made by Makkonen et al (2011), demonstrated that there is a significant difference regarding WTP for music tracks and that the group that differed from the other two groups was the age group of under 30 years. These differences, it is believed, could be produced given the fact that normally, the older a person, the higher his/her income is, or probably due to the risk aversion that is not the same for all age groups.

The third covariate expected to be included is the mean of transport usually used by the respondent. This variable was included based on the belief that the willingness to pay but especially the psychological ownership, towards a car, is not going to be the same for a person who usually uses its own private vehicle as for a person who frequently uses public transport. It is going to be treated as a categorical variable.

### 4. Research Design/Onderzoeksmethode

|  |  |  |
| --- | --- | --- |
| Variable | Name | Measurement |
| Independent | Level of customization | It is going to be treated as a categorical variable. In total there are going to be just 2 conditions. Each condition is going to be stated as follows:   * HCP = High customizable product (between 6 to 10 features to customize) * PCP = Poor customizable product (between 1 to 5 features to customize |
| Moderator | Type of features | It is going to be treated as a categorical variable. In total there are going to be just 2 conditions. Each participant is going to be assigned randomly to one of the following conditions:   * Hedonic features * Utilitarian features |
| Mediator | Psychological ownership | Measurement: 5 items scale including: I sense this car its mine; I feel a very high degree of personal ownership towards this car; I feel personally connected to this car; it is hard for me to think about this car as mine; this car does not make me feel that it is mine. Respondents will be asked to indicate their opinion on a seven-point scale (1= strongly disagree; 7 strongly agree) |
| Dependent | Willingness to pay | Respondents will be asked to give their willingness to pay for the customized product. |
| Covariate | Demographic data | The information required will be:  Age and gender. |

The study will be carried out through a 2 (HCP, PCP) x 2 (hedonic, utilitarian) between subject design online experiment in order to test the hypotheses previously developed. For the experiment, the respondents will be asked to fill out an online questionnaire and randomly will be assigned to one of the four experimental conditions.

Participants will be shown a standard car. The product was chosen based on the study made by Dhar & Wertenbroch (2000). then, they will be asked to customize that product based on the independent variables’ conditions assigned. Later, they will be required to fill out a five-item scale, developed by Pierce & Van Dyne (2004), in order to measure their psychological ownership toward the customized product. Finally, they will be able to give their willingness to pay for the customized object.

An ANOVA will be carried out, complemented with a mediation analysis that is comprised of three sets of regressions: X → Y, X → M, and X + M → Y (Kim, 2016). The whole analysis will be supported through the bootstrapping technique in order to get the expected results.

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