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How Packaging Materials influence the Consumers' Purchase Intention.

The Mediation Role of Perceived Quality.

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Dissertation written under the supervision of
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ABSTRACT

Title: "How Packaging Materials influence the Consumers' Purchase Intention. The Mediation Role of Perceived Quality."

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Nowadays, the Global Warming and Climate Change urgency have become undeniable. The disposal practice is universally recognized as one of the main causes of this societal challenge. As a consequence, the introduction of Environmentally Friendly (EF) Packaging Materials (PM) is part of the solution. Nevertheless, several questions must be raised. How do consumers perceive different PM in terms of quality? Are consumers translating their environmental concerns into actual purchasing behavior?

This study intends to evaluate how PM influence consumers' purchase intentions (PIs), considering Perceived Quality (PQ) as a mediator and Ethically Minded Consumer Behavior (EMCB) as a moderator. After choosing two different beverages (Gin and Whisky), the study went through four different steps: a focus group, the creation of stimuli, interviews and an online survey. The focus group unveiled three PM (Glass, Paper and Plastic), that were materialized under fictitious brands. The interviews aimed to test the acceptance of the stimuli. Furthermore, a quantitative analysis using IBM SPSS Statistics was performed based on 512 questionnaires.

Results show Glass as the preferred PM in both beverages, and Paper overcome Plastic PQ and PI's levels. This result suggests that consumers are willing to give up on Plastic for Paper, EF packaging options. This change of paradigm indicates the increasing reliability of consumers on EF options. This study also demonstrated the role of PQ as a moderator on the relationship between different PM and PIs, which was not proven in this study for the EMCB variable.

Keywords: Packaging Materials, Perceived Quality, Ethically Minded Consumer Behavior, Beverages, Alcoholic Beverages Industry

SUMÁRIO

Título: "De que forma os Materiais das Embalagens influenciam a Intenção de Compra dos Consumidores. O efeito mediador da Qualidade Percepcionada."

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Atualmente, a urgência para responder ao Aquecimento Global e às Mudanças Climáticas tornou-se inegável. A prática comum do descartável é universalmente reconhecida como uma das causas destes problemas ambientais. Assim, a utilização de materiais ecológicos nas embalagens é parte da solução. Contudo, diversas questões devem ser colocadas. Como percepcionam os consumidores diferentes materiais, em termos de qualidade? Estarão os consumidores a traduzir as suas preocupações ambientais no seu comportamento de compra?

Este estudo visa avaliar como os materiais das embalagens podem influenciar a Intenção de Compra (IC), considerando a Qualidade Percepcionada (QP) como mediador e o Comportamento Ético do Consumidor (CEC) como moderador. Após a escolha de duas bebidas (Whisky e Gin), quatro passos foram realizados: um focus group, a criação dos estímulos, entrevistas e um questionário online. O focus group desvendou três diferentes materiais (Vidro, Papel e Plástico), posteriormente materializados sob marcas fictícias. As entrevistas visaram testar a aceitação dos estímulos. Por último, foi realizada uma análise quantitativa tendo como base 512 questionários utilizando o programa IBM-SPSS-Statistics.

Os resultados obtidos neste estudo evidenciaram que Vidro é o preferido e Papel supera Plástico, tanto na QP como na IC das duas bebidas. Constata-se que os consumidores estão dispostos a desistir do Plástico para o Papel, uma opção mais ecológica. Esta mudança de paradigma indica o aumento de credibilidade em opções mais ecológicas. Esta conclusão reflete o impacto da QP como moderador da relação entre os materiais e as suas intenções de compra, o que não se verifica para o CEC.

Palavras-chave: Materiais das Embalagens, Qualidade Percepcionada, Comportamento Ético do Consumidor, Bebidas, Indústria de Bebidas Alcoólicas

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GLOSSARY OF ACRONYMS

PM	Packaging Materials
PI	Purchase Intention
PQ	Perceived Quality
EMCB	Ethically Minded Consumer Behavior
EF	Environmentally Friendly
Non-EF	Non-Environmentally Friendly
CPQ	Capable to Preserve the Quality
IPQ	Incapable to Preserve the Quality

CHAPTER 1: INTRODUCTION

1.1 Background and Problem Statement

Due to the increasingly fast path of consumer's buying behavior, packaging has taken on different roles, besides being used to fulfill its primary purpose of responding to functional necessities (Siddiqui, 2019). Nowadays, the packaging is considered an indispensable marketing tool, and essential to optimize logistics activities (Rundh, 2005).

Because of the aggressive competition's environment to captures customers' attention by companies, also justified by the fast standard of living, the packaging is perceived as a crucial vehicle for brand communication, and as a means of obtaining a competitive advantage over competitors (Hussain et al., 2015). Past literature has shown that around two-thirds of supermarket purchases are decided in-store (Schoormans & Robben, 1997), which confirms the power of packaging in influencing consumers' Purchase Intention (PI) (Hussain et al., 2015).

Besides the crucial impact that packaging has on consumers' daily lives, Packaging Materials (PM) are used to produce the packaging as a whole, which will ensure the life cycle of the product. After usage, the packaging becomes unnecessary (Steenis et al., 2017) . However, the disposable practice has been adopted all over the world, negatively contributing to the environment. The conventional plastic packaging is one of the major reasons for this bad practice that confronts society with serious pollution problems since it is predominantly chosen by most companies due to its low price and capability to be adapted for any type of products (Cooper, 2013). In fact, the usage of plastic materials exceeds in a large-scale other material such as paper, paperboard, metal and glass. In Europe, plastic has resulted in around 30 kg packaging waste annually per inhabitant in 2017 (Eurostat, 2020). Consequently, one of the biggest challenges of the 21st century concerns the necessity to protect the environment of the large amount of waste produced by human activity, which can only be minimized by adapting the world economy practices on behalf of environmental necessities (Geueke et al., 2018). To do so, the introduction of Environmentally Friendly (EF) packaging can be part of the solution (Geueke et al., 2018).

In fact, with the undeniable urge to adapt the world economy practices on behalf of environmental necessities, in the Consumer-Packaged Goods industry, several companies have started recently to embrace programs for reducing their ecological footprint by using

sustainable PM. The alcoholic beverage industry has been a pioneer on this matter, being the British global leader Diageo Plc one of them. This company will launch on the market the "world's first plastic-free paper-based spirits bottle" in 2021, under their sub-brand Johnnie Walker (Diageo, 2020; Forbes, 2020). This innovative bottle is made of paper leaving apart the iconic Johnnie Walker glass bottle. Another example of this kind of innovation is Carlsberg, which is working on the first paper beer bottle in the world, fully recyclable and made from wood fibers (Carlsberg, 2019).

Nevertheless, it is important to highlight that besides the shift made by companies for adopting EF PM, a sustainable world can only be possible if consumer's perceptions of this type of material are considered as part of the equation. It is scientifically evidenced that is through packaging that consumers infer quality perceptions (Becker et al., 2011; van Rompay et al., 2016), a variable studied to influence significantly consumers' PI (T. Z. Chang & Wildt, 1994; Ketelsen et al., 2020; Mugge & Schoormans, 2012). Having this in mind, it becomes crucial for companies to understand if their shifts for EF PM will generate a good acceptance by the consumers regarding Perceived Quality (PQ) of their products.

Having this said, this investigation aims to understand how different PM affect consumers' perceptions. To do so, several PM will be studied regarding their Environmental Friendliness and Capability to Preserve the Quality of the product. In addition, a special attention will be given to evaluate how the ethical behavior of consumers impacts the relation between packaging material towards PI.

In summary, the problem statement can be defined as:

> *How does Perceived Quality and Ethical Minded Consumer Behavior impact the Consumers' Purchase Intention for different Packaging Materials?*

The following research questions were developed to address the problem statement:
RQ1: What is the impact of different Packaging Materials on Consumers' Purchase Intentions?
RQ2: Does Perceived Quality mediates Consumers' Purchase Intention for different Packaging Materials?

RQ2a: Do Purchase Intention and Perceived Quality differ across Packaging Materials for different beverages?

RQ3: How does Ethically Minded Consumer Behavior impact the Consumers' Purchase Intention for different beverage Packaging Materials?

In this way, this study aims to shed new light on how consumers perceived quality towards different packaging materials across alcoholic beverages, without neglecting the effect of ethical behavior and the consequent effect on consumers' PI.

1.2 Relevance

It is unquestionable the urge to adapt consumption habits and behaviors, in favor of environmental sustainability, by reducing the ecological footprint of human beings. This topic was chosen to be explored in this thesis for being vital for the future of society. It is of current interest since several companies have already started to develop projects to respond to this societal challenge by applying packaging sustainability procedures. However, for this new strategy of companies to be successful, it is necessary to be aware that, accordingly to the available literature, PM can affect consumers' quality perceptions (Ketelsen et al., 2020). Despite this finding's relevance, there is a lack of investigation for understanding how PM can influence consumers' purchase perception (Steenis et al., 2017).

The irrefutable power of color (Rettie & Brewer, 2000) or the use of typefaces (Celhay & Trinquecoste, 2015) on every single packaging are features with a greater impact in consumers' perceptions. Nevertheless, little attention was paid to the possible influence of PM in PQ that is one of the variables more valuable for consumers (Ketelsen et al., 2020). For this reason, this new study aims to contribute to a better understanding of the relationships between different PM and consumers' PQ, with implications for PI and how the EMCB can play a role in this process.

In academic terms, this thesis intends to understand how consumers perceive different PM in terms of their Environmental Friendliness and Capability to Preserve the Quality of products, and how those perceptions of different PM are reflected on PIs. Additionally, PQ will be tested as a possible mediator of this relationship and EMCB as a possible moderator.

Concerning the managerial relevance, this study aims to highlight, for both managers and marketers, which PM are better perceived by consumers and how those perceptions can influence their consumption decisions in the alcoholic beverages industry. Thereby, understanding how consumers perceive each packaging material, companies can align their main goal of satisfying consumers' needs by choosing specific PM, ensuring the best of consumers' perceptions and, at the same time, sustainable practices.

1.3 Research Methods

To address the problem statement above-mentioned, both secondary and primary data, will be considered. Concerning secondary data, a review of the existing literature will be conducted to critically highlight the main findings regarding the variables studied under this investigation. Past literature will also be used to support the formulated hypothesis and to evidence the best constructs to use when studying the selected variables. After having decided the two alcoholic beverages to carry out this research, based on secondary data, three different studies will be done, each one with a different purpose. In the beginning, a focus group will be designed to understand consumer's perceptions on Environmental Friendliness and the Capability to Preserve the Quality of the products. After defining the PM, different stimuli will be created. To ensure the accuracy of those stimuli and consequent consumers' acceptance, semi-structured interviews (Saunders, M., Lewis, P., Thornhill, 2009) will be performed with real consumers. Furthermore, an online survey will be conducted to gather data, which would be a useful step to test the formulated hypothesis and answer the main research questions of this study after conducting a statistical analysis using IBM SPSS Statistics.

1.4 Dissertation Outline

This dissertation will present five chapters in total. The first and introductory chapter is followed by the second chapter, where a literature review is conducted addressing the chosen variables under this investigation, and the conceptual framework is presented. The third chapter aims to provide a detailed description of the research methods applied to collect data. In addition, the procedures performed for the statistical analysis of the obtained data are also presented. Furthermore, the fourth chapter presents the results of the statistical analysis and the consequent interpretation of the formulated hypothesis. Lastly, in the fifth chapter, the main conclusions and the major limitations of the study are presented, followed by research opportunities in this area of research.

CHAPTER 2: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

The following chapter presents a theoretical framework regarding the research topics covered in this thesis. It consists of a detailed analysis of the existing literature, i.e., state of the art, for supporting the foundation of the formulated research hypotheses. As a final note, is presented a conceptual framework.

2.1 Purchase Intention

PI is of the utmost importance within the marketing world (Morrison, 1979). PI can be defined as a preliminary stage of consumer behavior that, under the influence of others' attitudes and of unexpected situations factors, leads the purchase decision on a product (Keller, 2013). Likewise, Howard & Sheth, in 1969, argued that large differences can be noticed during the purchase process because situational facts are unconsciously considered by the consumer, from the moment the consumer has the intends to purchase a product until effectively decides for it (Clawson, 1971).

Several studies have recognized a positive relationship between PI and purchase behavior (Bemmaor, 1995; Clawson, 1971), and consequently, its ability to serve as a proxy for purchase behavior (Morwitz et al., 2007). On the other hand, PI is useful to predict actual purchases (T. Z. Chang & Wildt, 1994). For this reason, it is a common practice to use the PI to support strategic decisions regarding existing products, to predict future demand (Morrison, 1979), or to create new products (Morwitz et al., 2007). Additionally, PI is useful to decide on which markets and for which customer segments products should be launched (Sewall, 1981).

Moreover, consumers tend to trend their PI to a large extent for the packaging (Steenkamp, 1990), a process which is influenced by several factors such as the perceived value and the PQ (T. Z. Chang & Wildt, 1994; Mugge & Schoormans, 2012). This finding confirms that packaging has a crucial effect on PI (Hussain et al., 2015), mainly on the food (Vilnai-Yavetz & Koren, 2013) and the beverages (H. P. Chang et al., 2020) industries. This behavior is justified because consumers tend to exam the package design to create a brand impression (Orth & Malkewitz, 2008), an action that will determine whether they will effectively buy the product or not.

2.2 The role of Packaging

The available literature shows that there is no consensus in the scientific community on the definition of packaging.

Among researchers, the packaging is considered as an attribute of the product or is an attribute not-product-related. When considered packaging as a product's attribute, the literature has three distinct currents of thoughts for its sub-division, being considered as: (1) an intrinsic attribute, i.e., it can only be changed by modifying the physical composition of the product; (2) an extrinsic attribute, that is not part of the product itself or (3) either both intrinsic and extrinsic (Underwood, 2003). Contrarily, packaging can also be defined as an attribute not-product-related, being considered one of the five elements needed to the brand identity of any brand, along with brand name, logo & symbol, characters, and slogans (Keller, 2013). Nevertheless, packaging assumes a predominant role in the purchase process, the moment when consumers scan packages closely during their decision-making process (Orth & Malkewitz, 2008). The packaging was even considered the "salesman on the shelf" by Pilditch (Rettie & Brewer, 2000).

Although those different definitions, it is universally known as the basic functions of packaging: protection and consequential preservation, storage, and transportation of the product (Rundh, 2005). Those functions are complemented by the role of being a communicator to the final consumer (Oki & Sasaki, 2000). As time goes by, packaging has been assuming more functions in consumers' life. From the user convenience as well as from the managerial point of view, packaging serves as a marketing tool by ensuring the promotion of the product itself, and also as a logistic tool by enabling efficiency on storage and distribution activities (Rundh, 2005). For those reasons, packaging plays a crucial role in the competitive food (Rundh, 2005) and beverages (H. P. Chang et al., 2020) industries due to its power to influence consumers' PI (Hussain et al., 2015). Moreover, the packaging is seen as an essential tool to create and develop a consumer-based relationship, mainly for low involvement consumer nondurable products (Underwood, 2003).

As a consequence of the fast standard of living and of the extremely competitive environment to capture customers' attention by companies, the packaging is perceived as a crucial vehicle for brand communication and the advisable weapon to get a competitive advantage over competitors (Hussain et al., 2015). Schoormans & Robben (1997) alleged that around two-thirds of supermarket purchases are decided in-store. This statement was corroborated by

Frontiers in 1996, who showed that it is at the point of sale that 73% of a purchase decision is made (Rettie & Brewer, 2000). This finding is evidence of the power of packaging at the point of sale (Kumar Agariya et al., 2012). For this reason, companies keep innovating every day to improve their presence on the shelf. An example of this act is Walmart, an American retailer and the actual leader the list of the world's Top 250 global retailers (Deloitte Touche Tohmatsu Limited, 2020), which exhaustively test whether consumer perceives the brand promise transmitted by the package until three seconds up to 15 feet from the shelf (Keller, 2013).

2.1.1 Packaging Materials

Besides considering packaging as a whole, is essential to explore its different components and to recognize its impact during the consumers' decision process.

Packaging can be defined by physical evidence of the product container (Kumar Agariya et al., 2012), including features such as shape, color, and materials (Becker et al., 2011). Those features are considered aesthetic components of packaging (Keller, 2013) and essentials tools for marketers to address consumers' needs (Underwood, 2003). Consumers draw conjectures about the product based on symbolic information given by the product's features, and this action is considered an implicit rather than a deliberate process (Becker et al., 2011).

There are many studies for evaluating the power of color and shape on packaging performance (Becker et al., 2011; Grossman & Wisenbilt, 1999), in comparison with the existing variety of PM (Ketelsen et al., 2020). Nevertheless, PM play a crucial role in consumer's life, for having a significant impact when comes to (1) preserve and protect the product from external factors, (2) draw attention to new product innovation, and (3) create a positive perception regarding the product itself (Hussain et al., 2015). In this way, PM are considered an essential means to enhance the positioning of the brand (Becker et al., 2011) and also to influence consumers' perceptions.

In addition to those competencies, due to the undeniable urge to adapt the world economy practices on behalf of environmental necessities, the Consumer-Packaged Goods industry starts to notice the change in PM used by companies to reduce their ecological footprint by using EF materials (Ketelsen et al., 2020). Nevertheless, associated with the shift in changing PM, literature has invoked that those changes could affect consumers' sustainability perceptions as well as the PQ of the product and, consequently, taste perceptions (Ketelsen et al., 2020; Steenis et al., 2017).

2.1.1.1 The Impact of Packaging Materials on Consumers' Sustainable Perceptions

In practical terms, PM are used to ensure the life cycle of the product, and after usage, it becomes unnecessary (Steenis et al., 2017), voicing the disposal practice around the globe. Conventional plastic packaging plays a role in this matter since it is a cheap material and could be easily customized for any product. Albeit, plastic material results in many years to accomplish environmental degradation, characteristics that contribute to littering problems, including the catastrophic ocean pollution (Cooper, 2013). In fact, from the 50 million tons of plastic employed in Europe, only 10% are effectively recycled due to the lack of proper infrastructures to collect and recycle the material in several countries (Cooper, 2013). In turn, one of the biggest challenges of the 21st century concerns the necessity to protect the environment from the large amount of waste produced by human activity and ensure sustainable development of our planet (Zheng, 2012). Minimizing the enormous increase in waste and accumulated garbage (Oki & Sasaki, 2000), such as plastic, can be done by adapting the world economy practices on behalf of environmental necessities (Geueke et al., 2018). Thus, the introduction of EF packaging might be part of the solution (Geueke et al., 2018).

In the available literature, the discussion on the use of the EF packaging to minimize environmental risks has not yet addressed all aspects of this societal challenge. Several terms have been used by researchers to classify this type of packages, such as sustainable, green packaging, and eco-friendly packaging (Ketelsen et al., 2020). According to several researchers, sustainable packaging can be defined as "the endeavor to reduce the product's footprint through altering the product's packaging, for example, by using more EF materials" (Magnier et al., 2016). Notwithstanding, other researchers defined sustainable packaging according to three different levels: raw materials, production process, and waste management (Ketelsen et al., 2020). Despite those different perspectives, it is now clear that EF materials are crucial to shape a better future based on sustainable practices.

Two decades ago, consumers did not include in their purchase decision sustainable options. This happened because of their limited knowledge regarding EF PM (Van Dam, 1996). Moreover, over the last years, influenced by the Climate Change and Global Warming urgency, several studies have shown that sustainable consumption became a real concern for consumers (Herbes et al., 2020). Consumers perceive the PM as the main supporter of environmental consequences (Lindh et al., 2016), and thus they are starting to choose EF packaging instead of the standard one (Ketelsen et al., 2020).

2.1.1.2 The Impact of Packaging Materials on Consumers' Perceived Quality

It is well-accepted in the literature that packaging quality and consequently, its materials, significantly affect consumers' PIs (Siddiqui, 2019). Packaging perceived as good quality are correlated to higher taste perceptions (Elder & Krishna, 2010) and also leads to a positive perception regarding the product itself (Hussain et al., 2015).

As stated before, one of the functions of PM is the preservation of the product (Oki & Sasaki, 2000; Rundh, 2005). Thus, the willingness of consumers to choose a certain product over others will depend on consumers' PQ established towards PM. As so, PQ is a variable meticulously studied to be incorporated into companies' strategies having as a final goal the power to influence significantly consumers' PI (Chang & Wildt, 1994; Ketelsen et al., 2020; Mugge & Schoormans, 2012).

In the case of the beverage packaging, researchers have demonstrated that consumers are willing to jeopardize barely all the product's attributes, for EF beverage packaging, excluding the quality of the taste and price (van Birgelen et al., 2009). In other words, before choosing an environmental beverage packaging, only two attributes need to be fulfilled, quality of the flavor and price. Albeit price is considered a key factor by consumers for deciding to buy a product, this topic is not considered in this study to avoid monetary biases when comparing other product's attributes. In this way, excluding the price, this investigation will focus on the PQ followed by PM.

In light of the foregoing, a two-by-two matrix was created, including two different axes. PM were characterized as being EF vs Non-Environmentally Friendly (NEF) and Capable to Preserve the Quality (CPQ) of the product vs Incapable of Preserving the Quality (IPQ), which results in four quadrants. The fourth quadrant was excluded since it corresponds to the combination of both variables negatively conceptualized, i.e., packaging considered as NEF and IPQ. The results obtained in previous studies show that the fourth quadrant is rejected by consumers. This happens because consumer gives more value to the capability to preserve the flavor's quality than to the EF PM when choosing a particular product. As a consequence, from a managerial and business view, the fourth quadrant would not also be viable.

According to the aforementioned, the following hypotheses are formulated:

> *Hypothesis 1.a: A PM perceived as EF and CPQ is preferred in terms of PQ over a PM perceived as EF and IPQ.*

Hypothesis 1.b: A PM perceived as EF and CPQ is preferred in terms of PI over a PM perceived as EF and IPQ

Hypothesis 2.a: A PM perceived as EF and CPQ is preferred in terms of PQ over a PM perceived as Non-EF and CPQ

Hypothesis 2.b: A PM perceived as EF and CPQ is preferred in terms of PI over a PM perceived as Non-EF and CPP

Hypothesis 3.a: A PM perceived as Non-EF and CPQ is preferred in terms of PQ over a PM perceived as EF and IPQ

Hypothesis 3.b: A PM perceived as Non-EF and CPQ is preferred in terms of PI over a PM perceived as EF and IPQ

2.3 Perceived Quality

When evaluating a product, PQ is one of the key aspects taken into consideration by consumers (Zeithaml, 1988). Despite the constant effort made by companies in adjusting manufacturing processes and the product design itself, greater attention is also given to improve product quality perceptions through advertising strategies (Steenkamp, 1990).

Across the literature, instead of conceptualizing the variable as "quality", researchers decided to use the term "perceived quality", since quality judgments can be affected by the needs, perceptions, and goals of the consumers (Steenkamp, 1990). In respect of theoretical definitions, PQ can be defined as the degree that functional attributes of the product can fulfill the consumers' needs (Box, 1983). Other researchers argued that PQ can be considered as the ability of a product to offer higher levels of satisfaction to consumers relative to the available alternatives (Steenkamp, 1990). In other words, PQ can be defined as the judgment made by a consumer on the product's superiority over the other options (Zeithaml, 1988). From another perspective, PQ has to do with objective attributes of the product, which evokes consumer satisfaction (Oxenfeldt, 1950).

It is consensual that consumers draw quality perceptions towards products' attributes (Zeithaml, 1988). As previously mentioned, the product's attributes were conceptualized into intrinsic cues concerning the physical composition of the product, and extrinsic cues, which are not part of the product but are related. Using the beverage industry as an example, intrinsic cues include

the color, flavor, texture (Jacoby et al., 1971) and extrinsic cues concern the brand name, warranty, and package (Zeithaml, 1988). In reality, most of the time, consumers cannot taste a new product before purchase it. As a consequence, extrinsic cues become the only source of credibility for consumers (Zeithaml, 1988), a fact that enhances the importance of the packaging on consumers' decisions, being considered the key aspect for consumers to infer quality perceptions.

Alongside the embracing of EF materials by companies on their packages, justified by the undeniable necessity of adopting sustainable practices, PQ should not be neglected. In fact, the main barrier recognized by consumers to buy sustainable packaging is the lower quality perceived (Ketelsen et al., 2020), fact that corroborates with the urge to evidence product's quality and taste through packaging (Steenis et al., 2017).

Therefore, the following hypothesis is formulated:

Hypothesis 4: PQ mediates the effect of PM on PI.

2.4 Ethically Minded Consumer Behavior

Nowadays, one of the main concerns of consumers is how companies behave ethically, regarding the possible impact of their products on the environment (Bone & Corey, 2000), a concern which has contributed to the adaptation of EF lifestyles (Liu et al., 2017).

Nevertheless, within the field of consumer behavior, it is oftentimes recognized the "attitude-behavior gap" phenomenon, also known as the "intention-behavior gap" (Fishbein & Ajzen, 1977; Ketelsen et al., 2020). This phenomenon evidences the different behavior that exists between the consumers who have intentions to include in their purchasing decision-making ethical choices and those who truly translate those intentions into actual purchase decisions (Ketelsen et al., 2020). Thus it is important to ask the consumers about what they really do rather than measuring hypothetical situations or intentions (Sudbury-Riley & Kohlbacher, 2016).

When analyzing ethical consumer behavior, both ecological and social issues should be addressed (Sudbury-Riley & Kohlbacher, 2016). Several well-known scales have been applied to study ethical issues, such as the New Environmental Paradigm (Dunlap & Van Liere, 1978) and the Consumer Ethics Scale (Muncy & Vitell, 1992), but those measurements lack on reflecting effective behavior, concerning only beliefs and attitudes. In this way, the Ethically

Minded Consumer Behavior (EMCB) dimension is adopted for this study because it measures the actual behavior of consumers regarding several attitudes, such as (1) deliberation when comparing EF products over traditional options; (2) recycling behaviors; (3) deliberation when purchasing products with social and environmental issues associated and (4) the willingness to buy for an ethical product. As so, the EMCB level, inherent of each respondent, is expected to moderate how consumers behavior on their consumption habits (Sudbury-Riley & Kohlbacher, 2016).

Having this said, the following hypothesis is formulated:

Hypothesis 5: EMCB moderates the relationship between PM and PI.

2.5 Conceptual Framework

The following conceptual framework illustrates the relationship between the different variables analyzed under this investigation (Figure 1).

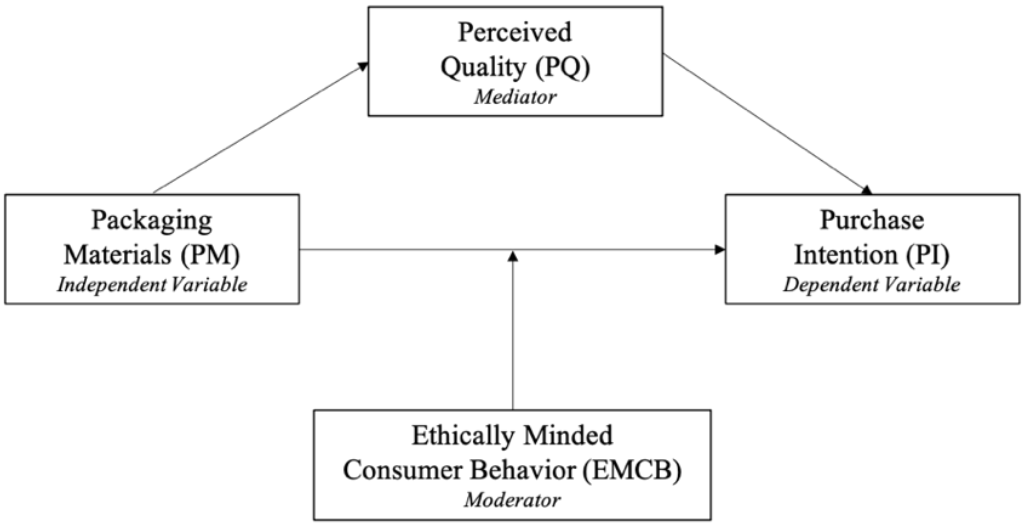

Figure 1: Conceptual Framework

CHAPTER 3: METHODOLOGY

The following chapter aims to describe the research methods used in this study. The main goal of this section is to develop a reliable scientific method to get a robust dataset suitable for testing the hypothesis previously mentioned. The explanation of the research plan and methods to obtain the primary data is followed by a description of the secondary data used.

3.1 Research Approach

The main goal of this dissertation is to understand the impact of beverage PM on consumers' PIs. For this purpose, the PQ is tested as a mediator and the EMCB as a moderator, following a conceptual framework designed based on past literature.

To answer the research questions previously formulated, a research approach (Figure 2) conceived to enable the practical execution was applied. This research approach was useful to translate the conceptual framework and the hypothesis into an operational plan. Both exploratory (semi-structured interviews and focus group) and explanatory methods (survey) were implemented (Saunders, M., Lewis, P., Thornhill, 2009).

A first decision to be made was the selection of an industry and a product category. The alcoholic beverage industry was chosen due to the recent effort of the world's larger producers in introducing sustainable packaging on the market (Forbes, 2020). To prevent the choice of the researcher from being biased, two alcoholic beverages, Gin and Whisky, were chosen based on the Portuguese consumers' consumption patterns (Marktest, 2016). This decision also allowed the two to be compared, and in particular, comparing their PM.

Secondly, a focus group was performed to discuss how participants would perceive different PM (the independent variable of the study), regarding the Environmental Friendliness and the CPQ of the product. This methodology allowed the selection of three different PM: Glass, Plastic, and Paper.

Thirdly, six stimuli were created to be further included in the main study by considering the two spirit drinks and the focus group's findings. Nevertheless, to confirm the truthfulness under consumers' eyes about the stimuli created, semi-structured interviews were conducted. This procedure was fundamental to understand if the stimuli were properly designed for being perceived as expected and to get a sense of whether some changes were needed.

Finally, an online survey was performed with the purpose of gathering the data that was later statistically analyzed. The questionnaire aimed to gather quantitative data, essential to test the conceptual framework and the hypothesis, by answering the research questions previously mentioned.

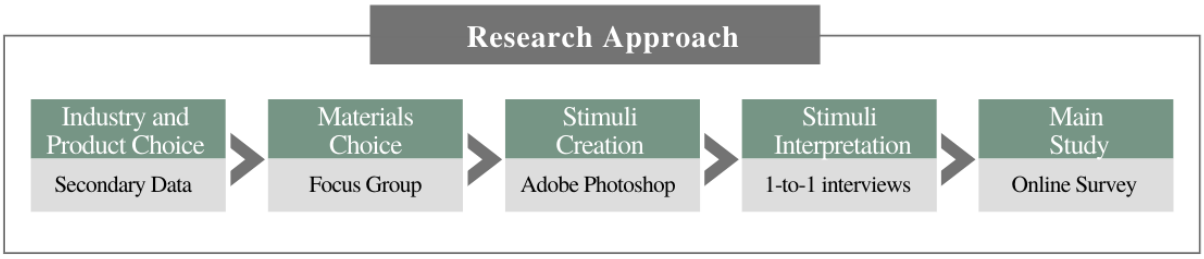

Figure 2: Research Approach – Process

3.2 Secondary Data

To acquire a better understanding of the main variables presented on the conceptual framework and to frame with accuracy the problem statement, secondary data was gathered from academic journals. The information gathered through bibliographic research was essential to formulate the research questions, to design the hypothesis, and to determine which constructs to use on this investigation.

Additionally, the investigation was conducted considering seven PM: Plastic, Glass, Paper, Aluminum (Ketelsen et al., 2020), Bamboo, Wood (Nurul Fazita et al., 2016), and Tetra pak (Korkmaz et al., 2009).

3.2.1 Choice of the Spirit Drinks

The choice of the two spirit drinks was based on secondary data.

Whisky – *"The classy alcoholic beverage."*

In 2015, Whisky signified almost a third of the Share of Shelf of the spirit drinks category, being considered the beverage in this category with the highest representation (Marktest, 2016). The segment has registered a stable representation over the last years, and in 2018 recorded an increase of 3% in volume in comparison with the previous year, according to Nielsen (DistribuiçãoHoje, 2019).

Gin – *"The trendy alcoholic beverage."*

In 2015, Portugal registered more than one million gin consumers and the beverage represented 13% of the Share of Shelf of the spirit drinks category, which corresponds to the third beverage with the highest representation. Over time, across the Portuguese market, Gin has registered a significant market penetration registering a significant increase between 2011 (4,9%) and 2020 (14,3%) (Marktest, 2020).

3.3 Primary Data

Several steps were chronologically implemented to collect original data next to real consumers: (1) PM Selection; (2) Stimuli Creation and Interpretation, and (3) Main Study.

3.3.1 Packaging Materials Selection

Considering the two beverages previously chosen, a subsequent step was required to understand how consumers perceive PM regarding the Environmental Friendliness and the Capability to Preserve the Quality of the product. For this purpose, a focus group was carried out.

3.3.1.1 Data Collection

A focus group was performed via Zoom, an online platform, given the limitations of personal contacts resulting from the Covid-19 pandemic's constraints, to collect data from real consumers. This methodology was conducted to promote a self-disclosure among participants and instigate group interaction. The focus group was carefully planned to foment a relaxed and informal atmosphere across a homogenous group of participants. The participants were around the same age range, from 5 different nationalities, and shared the same business academic background (Appendix 1).

The activities program of the focus group was divided into four parts (Appendix 2). The rules for each part were explained at the beginning of each activity.

In the first part – Warm-up – the moderator showed appreciation to all attendees for participating in this activity and has clarified the purpose of the study as well as the rules to comply with. Straight after, the moderator presented herself and encouraged everyone to follow the example.

During the second part – PM Classification – participants were asked to classify individually specific PM on a sheet of paper, according to their perception regarding the Environmental Friendliness and the CPQ of the product, without voicing their own opinions. After completing the individual task, the moderator asked them to send her a photo of their responses by private message to ensure the data confidentiality.

In the third part – Role-Playing Situation – participants were asked to imagine themselves in three real situations at the supermarket, where they had to decide on a specific beverage packaging material to buy for a third person. For each setup, enough details were given to ensure the formulation of a structured and realistic scenario by characterizing the third person regarding Environmental Consciousness and Degree of preference regarding different qualities of beverages (Appendix 2). This projective technique (Malhotra & Birks, 2007) meant to create a deliberation among the focus group, where a balanced reasoning was required to reach an agreement, concerning the third person characterization and the perceptions of the participants towards different materials previously characterized on the second part of the focus group. Thereby, it was possible to gather qualitative data regarding the different PM which were under this study (Figure 4). The moderator started the group discussion by reading out loud each

different scenario and tried to motivate the participants to have a dynamic conversation by suggesting them to share their perceptions previously written down considering the specific scenario. This activity was designed to find out which material would fit the three quadrants previously design, concerning both the Environmental Friendliness and the CPQ of the product (Figure 4).

Lastly, in the fourth part – The closure –, the moderator made herself available for answer further questions related to the activity and showed her gratitude for their participation in this activity.

3.3.1.2 Measurement / Indicators

To analyze both variables quantitatively, the Environmental Friendliness and the Capability to Preserver the Quality of the product, participants were asked to use a Likert scale from 1 (lowest and worst) to 5 (highest and best) (Figure 3). As a complement, qualitative data was collected upon further analysis of the session's record, during the role-playing activity (Figure 4).

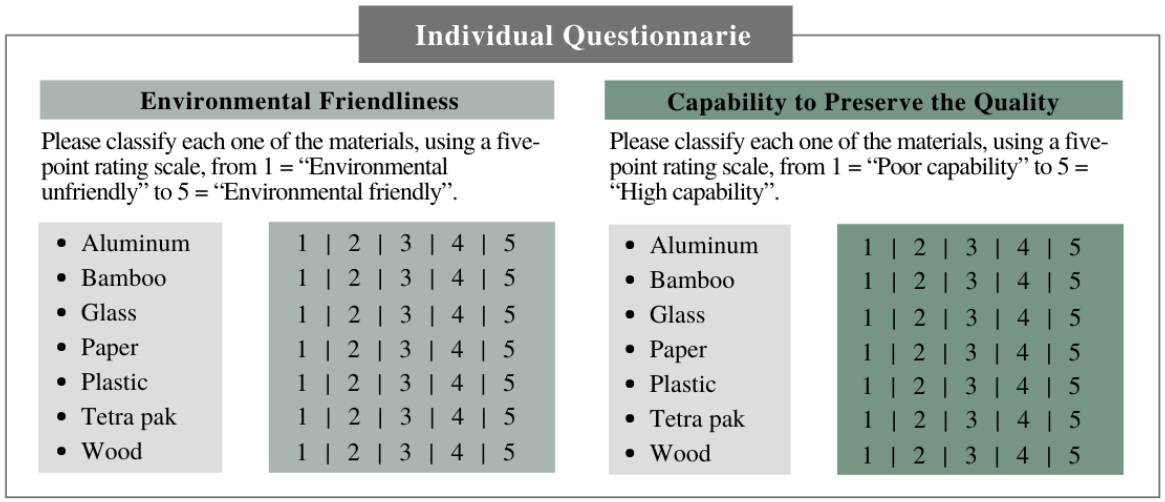

Figure 3: Focus Group – Individual Questionnaire

3.3.1.3 Data Analysis

When gathering both quantitative and qualitative data, three different materials were clearly identified to fit the three quadrants previously defined, regarding the Environmental Friendliness and the Capability to Preserve the Quality of the product variables (axes). Among the seven PM, Glass, Paper, and Plastic were chosen by the participants to be included in the matrix and so, to be considered for the next steps of this investigation: Glass as EF&CPQ; Paper as EF&IPQ and Plastic: Non-EF&CPQ. Further details are presented in Figure 4.

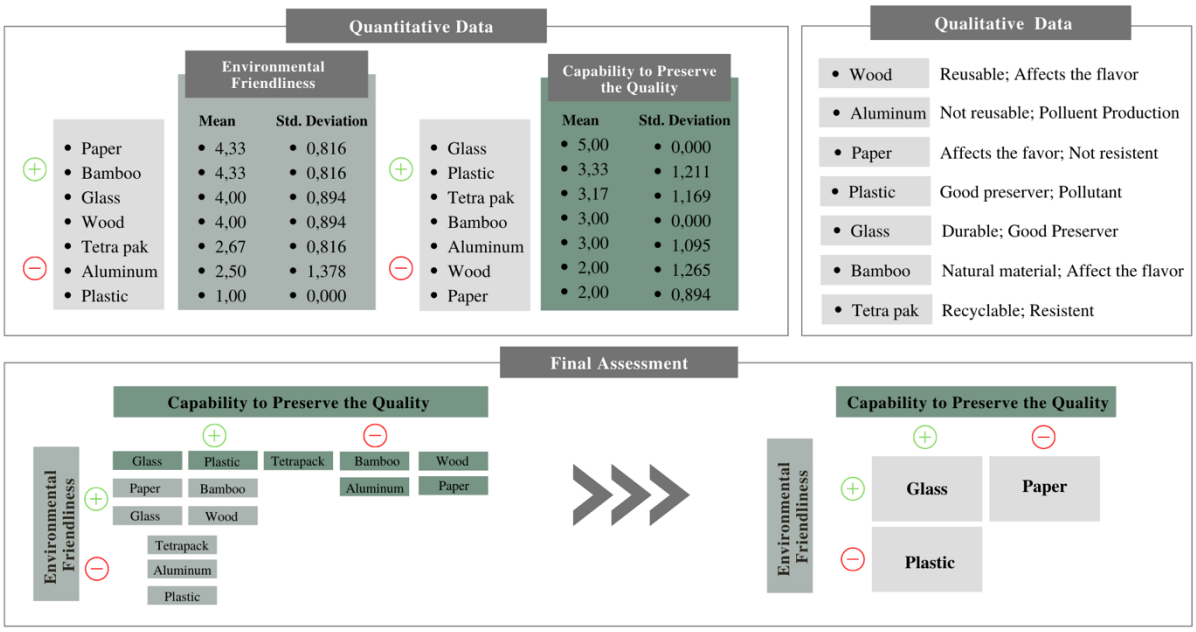

Figure 4: Focus Group – Results

3.3.2 Stimuli Creation and Interpretation

To avoid biased decisions related to previous experiences with real brands, two fictitious brands were created by the researcher for each type of beverage (Figure 5).

Figure 5: Fictitious brands – Gin and Whisky

Six stimuli were created regarding the categories of beverages previously chosen (Whisky and Gin), the corresponding fictitious brands, and the PM selected from the focus group (Glass, Paper, and Plastic). To conceive the stimuli as realistic as possible, this study relied on a partnership with a professional Photographer. This collaborative work was very useful to visually materialize the products by incorporating the understanding from the focus group and the logos predesigned in this thesis. Adobe Photoshop CC 2019 and Adobe Illustrator CC 2019 were the programs used to illustrate the six packages.

To ensure the expected interpretation and acceptance by consumers, regarding those different stimuli, as an essential step to proceed with the investigation, semi-structured interviews were conducted.

3.3.2.1 Data Collection

To obtain consumers' perceptions of the designed stimuli, 14 semi-structured interviews were performed with a convenient sample (Creswell, 2009). To guarantee different perspectives, the participants were chosen from different nationalities and different ages (Appendix 3). The interviews were performed in English and Portuguese and conducted by Zoom, supported by a visual presentation prepared for this thesis, where the six stimuli were presented.

3.3.2.2 Results

The main goal of this study was to assess how consumers reacted to different type of bottles that were designed with the intention of simulating different PM (Figure 6).

From the total of six stimuli presented, all participants interpreted three as intended, corresponding to the stimuli designed to be perceived as a glass bottle for both brands and the plastic bottle for the Gin's brand. However, the stimulus created to be perceived as a paper bottle for both brands were not explicit enough to convey 50% of the participants. Four problems were identified: i) the difficulty for consumers to identify the packaging material as paper; ii) the brand's name were illegible when reading over the light brown chosen, particularly for the Whisky bottle, iii) the unlikely readiness of consumers to imagine both beverages packaged on paper-based material, and iv) the consumer's awareness and instinctive mindset to think in the fashion recycled bottle made from aluminum. In addition to those considerations, a valuable aspect was mentioned concerning the difficulty to understand which recycling container the package should be inserted. Regarding the plastic bottles, only the Gin's bottle was interpreted as expected, in contract with the Whisky's bottle, which was perceived by some interviewees as being made from porcelain.

As a consequence, three main decision were made to adjust the visual presentation of the bottles: (1) it was included the recycling container for all bottles at the back of the bottle to make it as real as possible; this was done with the purpose of clarify the correct container but also to raise attention for the type of material used; (2) it was employed a different texture on the paper bottles and added the black sticker behind the logo to make it easier to read, and (3) it was chosen the type of bottle which did not raise doubts about the packaging material for both beverages.

Figure 6: Stimuli Interpretation – Results

Therefore, six new stimuli were created (Figure 7 to Figure 12), and to ensure that participants could now have a more enlightening view of the material used in the bottles, a second interview was scheduled with each participant who did not recognize at first sight as expected to test the next version. After being exposed to the new version, all participants perceived the bottles as expected, showing that our decision to improve the visual aspect of the bottles was successful. Therefore, the new stimuli were chosen to proceed with the investigation instead of the previously designed.

Figure 7: Whisky packaged with a Glass Bottle

Figure 8: Gin packaged with a Glass Bottle

Figure 9: Whisky packaged with a Paper Bottle

Figure 10: Gin packaged with a Paper Bottle

Figure 11: Whisky packaged with a Plastic Bottle

Figure 12: Gin packaged with a Plastic Bottle

3.3.3 Online Survey

An online survey (Appendix 4) was conducted to gather a robust dataset further to answer the problem statement and consequent research questions.

3.3.3.1 Pilot Testing

Before launching the survey, 10 pilot testing were conducted to the survey in EN and PT, with participants of different ages so that it was possible to detect potential failures or misunderstanding problems. As a result of this pilot test, several changes were suggested: i) the necessity of writing "Q" before every single question, a fact noticed by older people who are not used to answer online questionnaires; ii) the elimination of an attention check that was included on block 3 (a construct with more than 5 items), that confused the respondents, and iii) some adjustments were needed regarding the translation from English to Portuguese to ensure the correct understanding of the items.

3.3.3.2 Data Collection

The online survey was published on November 21st and was available until November 30th of the current year, 2020. The questionnaire was shared through social media platforms (Instagram, Facebook and LinkedIn) and by email, and it was available in English and Portuguese. From a total of 702 responses registered, only 512 were considered valid after having been subjected to a "cleaning" process, which consisted of eliminating participants in accordance with several aspects, further explained in Chapter 4.

3.3.3.3 Research Design

Due to the low costs associated and the fast-spreading effect, was used a non-probability technique, i.e., the respondents were not randomly chosen, to obtain the data (Saunders, M., Lewis, P., Thornhill, 2009).

The performed survey included five different blocks. In the first one, a brief introduction and contextualization of the survey were presented, followed by two screening questions to infer if the respondent was legal age to consume alcoholic beverages and to determine if the respondent had purchased an alcoholic beverage in the last year. Secondly, two questions were formulated to understand the frequency and consumption habits of the participant. Thirdly, the EMCB construct was presented to evaluate how respondents act ethically on a daily basis. For the fourth block, each participant was randomly allocated to a stimulus where was presented with

three different blocks of questions, including manipulation check, quality perceptions and purchase perceptions. Lastly, the fifth block included demographics questions.

3.3.3.4 Measurement

Following a careful analysis of the existing literature, three constructs were selected (Table 1), for being considered suitable to measure the variables considered under this investigation. For all the constructs, the sentences kept the original versions. However, to obtain the consumers' responses as more precise as possible, and to ensure consistency according to all constructs, the online survey included 7-point Likert scales, being 1 = "Strongly disagree" or "Very unlikely" to 7 = "Strongly agree" to "Very Likely". The EMCB construct experienced an adjustment, being the scale adapted from a 5-point Likert scale to a 7-point scale, being 1=" Never" to 7=" Always".

Variable	Construct	Literature	Scale	Number of items	Cronbach's α
Dependent Variable	Purchase Intention	(Chang et al., 2020) (adapted from Lee et al., 2010; Yazdanpanah et al., 2015)	7-point Likert scale	5	0.924
Mediator	Perceived Quality	(Bao et al., 2011) (adapted from Grewal et al. 1998; Keller and Aaker 1992)	7-point Likert scale	4	0.95
Moderator	Ethically Minded Consumer Behavior	(Sudbury-Riley, 2016) (adapted from Roberts, 1993, 1995, 1996a 1996b)	7-point Likert Scale	10	0.93
Independent Variable	Packaging Materials	na	na	Stimuli	na

Table 1: Operational Model

3.3.3.5 Data Analysis

Qualtrics was the online tool chosen to design, operationalize, and distribute the survey. After the questionnaire being closed, the dataset was extracted from Qualtrics to an Excel file. The "cleaning" process was conducted, and the validated dataset was imported to IBM SPSS Statistics. IBM SPSS Statistics was used for processing the dataset. Before proceeding with the statistical analysis, all constructs were subject to the Cronbach's Alpha reliability test. After measuring internal consistency of the dataset, it was necessary to check if the data were parametric or not. By checking that the data were non-parametric, was applied the Mann-Whitney U test instead of an Independent-t-test. The Hayes' PROCESS tool, using models 1

and 4, was applied to test the mediation and the moderator effect, respectively. To test the effect of the full model, model 5 was applied (Figure 13).

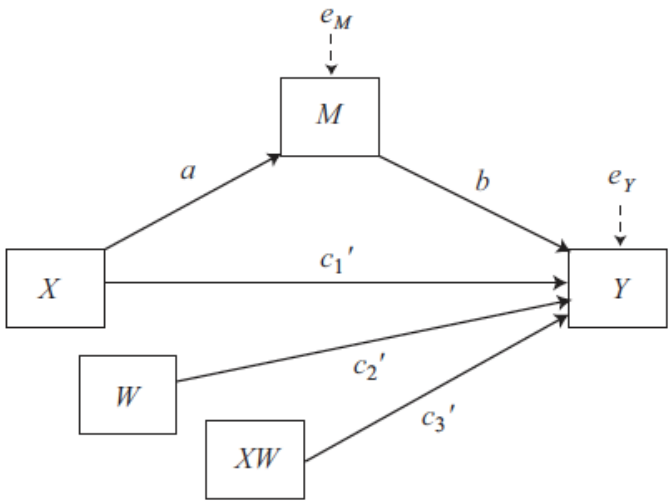

Figure 13: Model 5 – Mediation (M) with Moderation (W) of the direct effect of an Independent Variable (X)

CHAPTER 4: RESULTS AND DISCUSSION

The following chapter aims to present the results from the quantitative data collected through the online questionnaire. The obtained dataset was "cleaned" and prepared before the sample characterization, the constructs' reliability measurement, and the manipulation check. After this preliminary procedure, it was conducted a statistical analysis to test the hypotheses and the conceptual framework.

4.1 Data Preparation

The online survey was closed with a total of 705 responses. From this total of responses, only 602 (85,39%) were considered valid to proceed with the investigation since it was found that 103 of the participants did not finish the questionnaire. The veracity of responses was checked by following two steps. Firstly, regarding the two screening questions (block 1), it was possible to define a group of 21 participants with no legal age to drink alcoholic beverages and a group of 61 participants who had not bought it in the last year. Furthermore, the Mahalanobis Distance test was conducted to detect outliers, which result in the elimination of eight responses. As a consequence, from the initial total of 705, only 512 (72,6%) valid responses proceeded for statistical analysis and were subject to a random assignment across six different stimuli (S1: Gin presented in Glass; S2: Gin presented in Paper; S3: Gin presented in Plastic; S4: Whisky presented in Glass; S5: Whisky presented in Paper and S6: Whisky presented in Plastic) (Table 2). Additionally, it was necessary to re-code one item of the PQ construct to ensure the compatibility of results (Appendix 5).

Block 1	Block 2	Block 3	Block 4						Block 5
			S1	S2	S3	S4	S5	S6	
512	512	512	97	93	91	76	87	68	512

Table 2: Illustration of the valid responses by stimuli

4.2 Sample characterization

Overall, when analyzing the population of validated responses, it appears that most respondents were female (66,7%), mainly Portuguese citizens (94,5%) and, aged between 18-43 years old (76,4%). Additionally, most participants owned a high level of education (87,7%) and were employed (41,8%). In terms of their household gross monthly income, most of the respondents have a medium-income, ranging from 1001€ to 4000€ (63,1%). The demographics data indicated that the respondents who were randomly assigned for each stimulus have similar characteristics, defining homogenous groups (Appendix 6).

In respect of alcoholic beverages' purchase habits, participants concentrate their purchase frequency between weekly and monthly (71,5%). The main driver of buying is the consumption with friends and family (55,01%), followed in the same proportion by the individual consumption (22,67%), and the intention to offer an alcoholic as a gift (22,32%). Regarding the place of consumption, home is the preferable choice to do it, a result that could be justified by the current pandemic situation worldwide (Appendix 7).

4.3 Measurement Reliability

The constructs selected for this investigation were previously discussed in other studies regarding their consistency and reliability. However, it becomes crucial to analyze the performance of those constructs adjusted to this study. With this purpose, the Cronbach's alpha test was conducted for each construct in general (Table 3) and for each stimulus (Appendix 8). According to (George, D., & Mallery, 2003) evaluation, most constructs show Excellent or Good quality. The results obtained are conclusive and allow us to proceed with the statistical analysis with no need for more adjustments.

Construct	Cronbach's Alpha	Number of items	Quality
Ethically Minded Consumer Behavior	0,883	10	Good
Perceived Quality	0,874	4	Good
Purchase Intention	0,950	5	Excellent

Table 3: Cronbach's alpha test results

4.4 Manipulation Check

Before proceeding with the hypothesis testing, it was conducted the manipulation check test to analyze if participants react as expected to all the six manipulations created. Regardless of which stimulus were allocated, each participant had to choose a level of agreement (being 1= Disagree, 2= Neutral, and 3=Agree) for the packaging material. Since each stimulus only corresponds to one material, descriptive analyses (Appendix 9) were conducted to understand in general how each packaging material was perceived. The six stimuli presented higher levels of perception by participants in relation to the right packaging material. Glass was the packaging material better perceived by respondents across both beverages (Gin: M=2,91; SD=0,384 and Whisky: M=2,96; SD=0,255), followed by Plastic (Gin: M=2,55; SD=0,806 and Whisky: M=2,81; SD=0,58) and by Paper (Gin: M=2,34; SD= 0,853 and Whisky: M=2,47; SD=0,833). Furthermore, to understand if the PMs were statistically different, Mann-Whitney U tests were performed instead of Independent t-tests, since the assumption of normal

distribution was not met for all groups (Appendix 10), after performing the Kolmogorov-Smirnov Test. Results show that the three PM for both beverages were statistically different since p-value was below 0,05 for all cases (Appendix 11), which implies that the manipulation done for the different PMs was well developed.

4.5 Hypothesis Testing and Results

In order to test the formulated hypothesis presented in Chapter 2 several statistical tests were performed with a significant level (p-value) of 0,05. Statistical tests were repeated with the dataset that does not include the respondents who did not classify the correct material with number 3 (=Agree) on the manipulation check (N=410), but no significant differences were found when compared to the dataset that includes all answers (N=512).

4.5.1 Packaging Materials and Beverages

The Independent-Sample T-test was chosen to investigate consumers' quality perceptions and PIs across different PM, according to the way how hypotheses were formulated (comparing two different groups). Considering that this investigation uses two different and independent beverages, the hypotheses were tested for both cases (Gin and Whisky).

As a preliminary step, before proceeding with the statistical analysis, to ensure the feasibility of the appropriate test, several assumptions were evaluated. Firstly, the dependent variables (PQ and PI) were measured on a continuous Likert scale from 1 to 7, and the independent variable consists of three independents groups. The independence of observations was guaranteed by assigning participants to only one stimulus. Additionally, with all significant outliers previously eliminated, it becomes crucial to test the normal distribution of the dependent variable. After conducting the Kolmogorov-Smirnov Test, it was possible to verify that PQ and PI were not normally distributed across the majority of the stimuli. The exceptions are S4 (Whisky in Glass) & S5 (Whisky in Paper) for PQ and S2 (Gin in Paper) & S3 (Gin in Plastic) for PI, having both a significant level higher than 0,05 (Appendix 12). For those stimuli that violate this assumption, the data is considered non-parametric. In this case, instead of performing an Independent-Sample T-test, which is used strictly for parametric data, the Mann-Whitney U test was applied. Nevertheless, for those stimuli that passed the Kolmogorov-Smirnov test, it was conducted the Levene's test for equality of variances recommended for parametric data (Laerd Statistics, 2018). The results of this test show that for both cases (S4 vs S5 and S2 vs S3) the assumption was not met (Appendix 13 and 14). Thus, all data was classified as nonparametric to further proceed with the statistical analysis.

From here, the statistical analysis adopted a denomination for each material based on their peculiar characteristics (§ Chapter 3): Glass is named EF&CPQ; Paper is named EF&IPQ; and Plastic is named Non-EF&CPQ.

4.5.1.1 Hypothesis 1

Hypothesis 1.a: A PM perceived as EF and CPQ is preferred in terms of PQ over a PM perceived as EF and IPQ.

The Mann-Whitney U test was performed to evaluate the difference of means regarding PQ between Glass and Paper. For both Gin and Whisky, Glass presents the highest mean and the lowest standard deviation (M=5,150; SD= 0,989 and M=5,151; SD=0,980, respectively) when compared with Paper (M=4,715; SD=1,061 and M=4,563; SD=1,191, respectively). Glass was preferred over Paper, presenting a higher mean rank on both beverages (Gin: Mean Rank=106,46 vs Mean Rank=84,06 and Whisky: Mean Rank=94,31 vs Mean Rank=71,25, respectively). The result of the Mann-Whitney U test for both beverages is statistically significant (p-value<0,05), evidencing that the means of Glass and Paper are statistically different in terms of PQ (Appendix 15). Having this said, the formulated hypothesis is valid for both cases (Figure 14).

Hypothesis 1.b: A PM perceived as EF and CPQ is preferred in terms of PI over a PM perceived as EF and IPQ

Once again, the Mann-Whitney U test was conducted to check the difference of means on PI between Glass and Paper. For Gin and Whisky, Glass presents the highest mean and the lowest standard deviation (M=5,039; SD=1,044 and M=4,847; SD=1,296, respectively) when compared with Paper (M=4,480; SD=1,126 and M=4,425; SD=1,396, respectively). In both beverages, Glass was preferred over Paper, as indicated by the higher Mean Rank (Gin: Mean Rank=108,75 vs Mean Rank =81,68 and Whisky: Mean Rank=90,07 vs Mean Rank=74,95, respectively). It was found that the result of the Mann-Whitney U test is statistically significant (p-value<0,05) for both beverages evidencing that the means of Glass and Paper regarding PI are statistically different (Appendix 16). Having this said, the formulated hypothesis is valid for both cases (Figure 14).

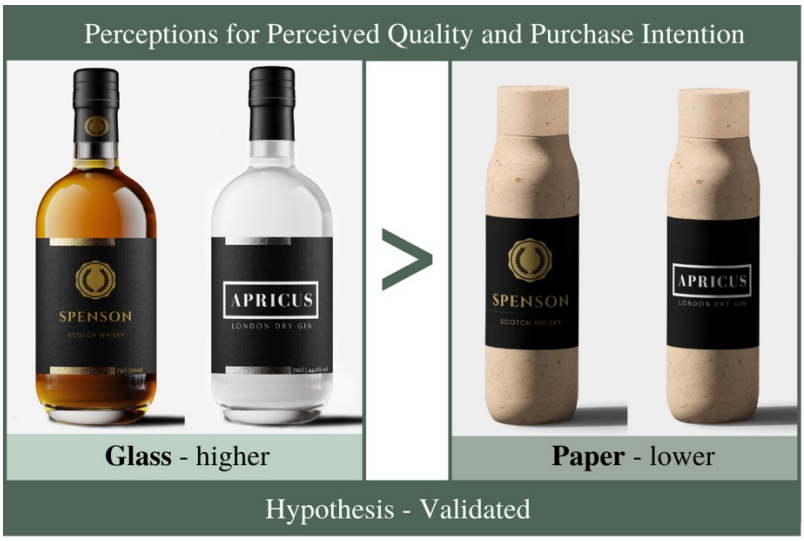

Figure 14: Hypothesis 1 – Results

4.5.1.2 Hypothesis 2

Hypothesis 2.a: A PM perceived as EF and CPQ is preferred in terms of PQ over a PM perceived as Non-EF and CPQ

For understanding the difference of means on PQ between Glass and Plastic, the Mann-Whitney U test was performed. Glass presents a considerably higher mean and a lower standard deviation (Gin: M=5,150; SD= 0,989 and Whisky: M=5,151; SD=0,979) when compared with Plastic (Gin: M=3,890; SD=1,362 and Whisky: M=3,463; SD=1,171), regarding the PQ. In both beverages, Glass is preferred with a large advantage over Plastic since it presents a higher mean rank (Gin: Mean Rank=118,47 vs Mean Rank=68,95, and Whisky: Mean Rank=96,91 vs Mean Rank=45,22, respectively). The result of the Mann-Whitney U test is statistically significant (p-value <0,05) for both beverages evidencing that the means of Glass and Plastic are statistically different in respect of PQ (Appendix 17). Having this said, the formulated hypothesis is valid for both cases (Figure 15).

Hypothesis 2.b: A PM perceived as EF and CPQ is preferred in terms of PI over a PM perceived as Non-EF and CPQ

In respect to the PI, the Mann-Whitney U test was performed to evaluate the difference of means between Glass and Plastic. For both beverages, Glass presents the highest mean and the lowest

standard deviation (M=5,039; SD=1,044 and M=4,847; SD=1,296, respectively) when compared with Plastic (M=3,455; SD=1,725 and M=2,765; SD=1,462, respectively). The results show that Glass is preferable over Plastic, as pointed by the considerable difference of mean rank (Gin: Mean Rank=119,42 vs Mean Rank=67,94 and Whisky: Mean Rank=96,53 vs Mean Rank=45,64, respectively). In this case, the result of the Mann-Whitney U test is statistically significant (p-value<0,05) for both beverages evidencing that the means of Glass and Plastic are statistically different regarding PI (Appendix 18). Having this said, the formulated hypothesis is valid for both cases (Figure 15).

Figure 15: Hypothesis 2 – Results

4.5.1.3 Hypothesis 3

Hypothesis 3.a: A PM perceived as Non-EF and CPQ is preferred in terms of PQ over a PM perceived as EF and IPQ

Considering now the last combination of PM, Paper and Plastic, the Mann-Whitney U test was conducted to assess their difference of means regarding the PQ. Surprisingly, Paper presents the highest mean for both beverages (M=4,715; SD=1,061 and M=4,563; SD=1,191 respectively), when compared with Plastic (M=3,890; SD=1,361 and M=3,463; SD=1,17122, respectively). Therefore, Paper is preferred over Plastic, having a higher mean rank on both beverages (Gin: Mean Rank=118,02 vs Mean Rank=76,64, and Whisky: Mean Rank=94,22 vs Mean Rank=57,25). Also, the result Mann-Whitney U test is statistically significant (p-value<0,05) for both beverages proving that the means of Glass and Paper are statistically different in terms of PQ (Appendix 19). Having this said, the formulated hypothesis is rejected

for both cases. In conclusion, participants have higher preferences for a PM considered as EF&IPQ over a PM perceived as Non-EF&CPQ in terms of the PQ, contrary to what was expected (Figure 16).

Hypothesis 3.b: A PM perceived as Non-EF and CPQ is preferred in terms of PI over a PM perceived as EF and IPQ

Lastly, the Mann-Whitney U test was performed to analyze the difference of means between Paper and Plastic regarding the PI. As expected, after considering the beforementioned conclusion, for both beverages, Paper presents the highest mean in terms of the PI (Gin: M=4,480; SD=1,126 and Whisky: M=4,425; SD=1,396, respectively), when compared with Plastic (Gin: M=3,455; SD=1,725 and Whisky: M=2,765; SD=1,462, respectively). Thus, Paper was preferred over Plastic for having a high mean rank for both beverages (Gin: Mean Rank=109,91 vs Mean Rank=74,71, and Whisky: Mean Rank=98,08 vs Mean Rank=52,31). Moreover, the result of the Mann-Whitney U test is statistically significant (p-value<0,05) for Gin and Whisky (Appendix 20), indicating that the formulated hypothesis is not valid for both cases (Figure 16).

Figure 16: Hypothesis 3 – Results

4.5.1.4 Testing the Beverage Impact

Gin and Whisky were used to evaluate if beverages are perceived differently when considering different PM. The results show that Plastic is the only material that presents statistical differences (Figure 17) in regard to the PQ (Appendix 21) and the PI (Appendix 22). Plastic was the PM, where the type of beverage has an impact on consumers' choice.

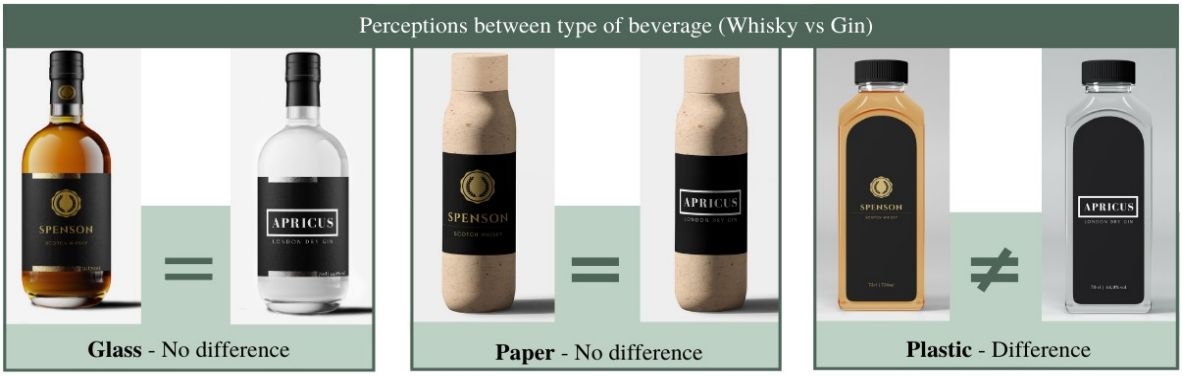

Figure 17: Testing the Beverage Impact – Results

4.5.2 Conditional Process Analysis

The Hayes' PROCESS analysis tool (Hayes, 2013) was useful to test the potential mediation effect of the PQ, as well as the potential moderation effect of the EMCB (EMCB) on the relationship between PM and PI. Because the independent variable assumes six different scenarios (i.e., three distinct materials on two distinct beverages), the six stimuli were reorganized into three distinct groups: Glass, Paper, and Plastic, resulting in a multicategory independent variable. The Glass group served as a reference group, the Paper group (X_1) and the Plastic group (X_2) (Hayes, 2018).

4.5.2.1 Hypothesis 4

Hypothesis 4: PQ mediates the effect of PM on PI.

The Hayes' PROCESS model 4 was applied to test the mediation effect of the PQ on PM and PI (Appendix 23).

The model indicated a R-Squared of 21% (Appendix 23) and was statistically significant ($p < 0{,}001$), meaning that different PM were perceived differently in terms of PQ.

Considering the fact that this study encompasses a multi-categorical variable, two relative indirect effects must be considered: the impact of choosing Paper relative to Glass and the impact of choosing Plastic over Glass. As might be expected, different PM are differently

perceived in terms of quality as illustrated by path a_1 (-0,5086) for Paper and a_2 (-1,4427) for Plastic from Figure 18. In fact, both PM are statistically significant (p-value<0,001). The effect of the PQ on PI regardless of the PM is given by b=0,8446. Having this said, it becomes possible to estimate the relative indirect effects of Paper as -0,430 (a_1b=-0,5086*0,8446) and of Plastic as -1,220 (a_2b=-1,4427*0,8446). Taking Glass as the reference group, the PIs for Paper decrease by -0,430, because Paper was seen as a worse choice than Glass in terms of quality. The same reasoning is applicable for Plastic, since its PI decrease by -1,220 when compared to Glass. As a consequence, since both relative indirect effects are different from zero, the PI for PM is moderated by PQ.

When considering the direct effects of Paper (c'_1 = -0,0720) and of Plastic (c'_2 = -0,5767) both have a negative effect, however only Plastic is statistically significant (p<0,001). Consequently, being Plastic's direct effect significant can be said that PQ is not fully responsible for the impact on PI. Besides being a partial mediation, the formulated hypothesis is considered valid.

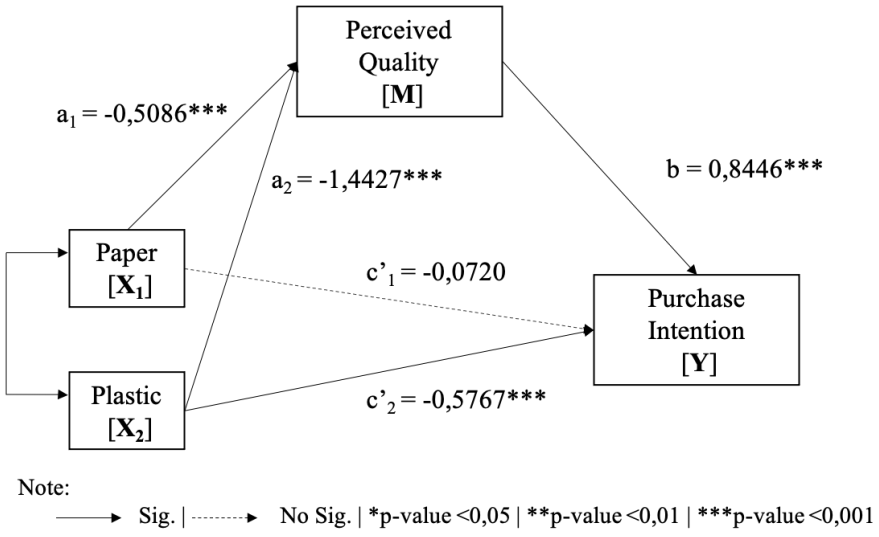

Figure 18: Statistical Model – Mediation – Coefficients

4.5.2.2 Hypothesis 5

Hypothesis 5: EMCB moderates the relationship between PM and PI.

As stated before, the independent variable is considered multi-categorical. Therefore, as a first approach to test the moderator hypothesis, the "Test(s) of highest order unconditional interaction(s)" was taken into account since it compares two different models (Hayes, 2018). The first model compared PM and EMBC, by fixing the effect of PM independently of EMCB.

The second model adds to the first model the products from the interaction between PMs and EMCB, allowing the PM to vary linearly with EMCB (Hayes, 2018). In accordance with the output (Appendix 24), from the first model to the second model can be noticed an increase of the variance in PI of around 12% (R-Squared of the model 2=0,2619). This result is statistically significant (p-value<0,05), F (2,506)=4,1198, suggesting that EMCB moderates the effect of PI. In other words, the EMCB seems to have an impact on PIs for the different PM.

The interactions of X_1*EMCB and X_2*EMCB are represented by the regression coefficients b_4=0,101 and b_5=-0,251, respectively (Figure 19). When comparing two participants that differ in one unit on EMCB, the value obtained for b_4 means that the preference of participants for Paper over Glass differs by 0,101. Likewise, b_5 indicates that the preference of participants for Plastic decreases. Those results seem to indicate that participants with higher EMCB will prefer EF options over the Non-EF. Nevertheless, despite being b_5 very close to achieve a p-value lower than 0,05, both interactions (b_4 and b_5) are not statistically significant. The value of b_3 (=0,245) was estimated for the relationship between EMCB and PI of the reference group (Glass as PM). When considering two people who differ in one unit on EMCB value, the preference for Glass increases by 0,2446. This positive relationship is statistically significant.

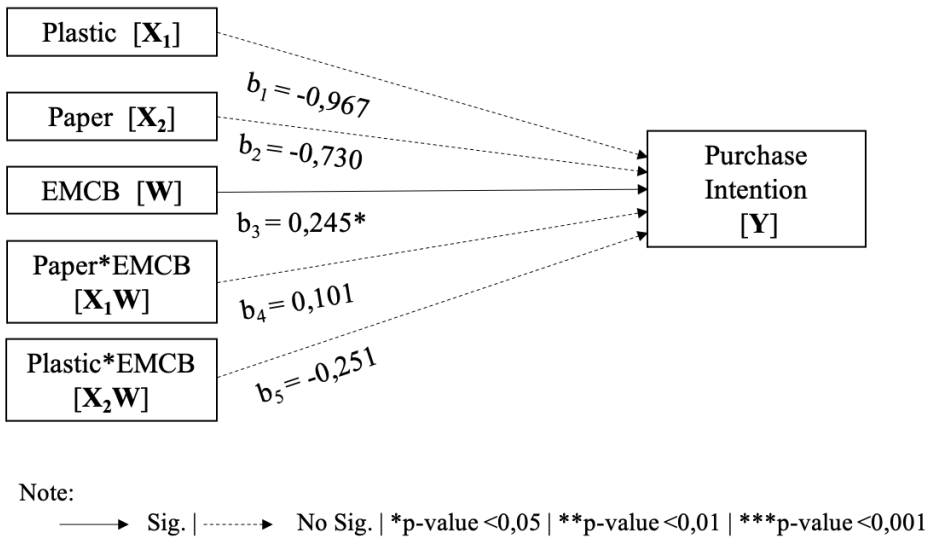

Figure 19: Statistical Model – Moderation – Coefficients

Despite the fact that interactions are not statistically significant, it is possible to verify how PIs differ for different PM, when considering different levels of EMCB in Figure 20. The PROCESS (Hayes, 2018) suggests three different levels of EMCB: "relatively low" = 3,10,

"relatively medium" = 4,5 and "relatively high" = 5,5. It is possible to interpret that a higher level of EMCB contributes to a higher PIs of EF options (Glass: PI=5,265 and Paper: PI=4,856) when compared to a lower level of EMCB (Glass: PI=4,678 and Paper: PI=4,026). The opposite, although less apparent, can be seen for Non-EF (Plastic), as the EMCB increases, lower PIs were recorded (PI=3,17 and PI=3,15).

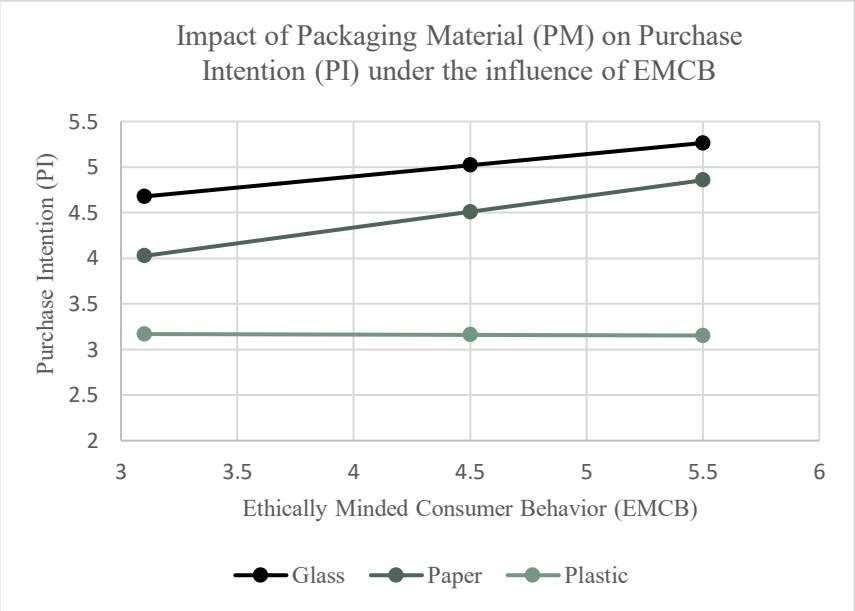

*Figure 20: Interaction Effect of PM*EMCB on PI – Moderation*

As a conclusion, the EMCB only seems to significantly impact the choice of Glass (when considering people who differ in terms of EMCB levels) and it is close to moderate the relationship between Glass and Plastic (p-value =0,0551).

4.5.2.3 Full Model

To analyze the conceptual framework as a whole the PROCESS model 5 was employed (Hayes, 2018). The result obtained with this model was statistically significant (p-value <0,001), but only 21% of the variance was explained (Appendix 25). As a consequence, from the analysis previously done, it can be said that the mediator PQ controls by far the model with high significant levels (p<0,001), when compared with the performance of the EMCB as a moderator when comparing different PM, which is not proven (Figure 21).

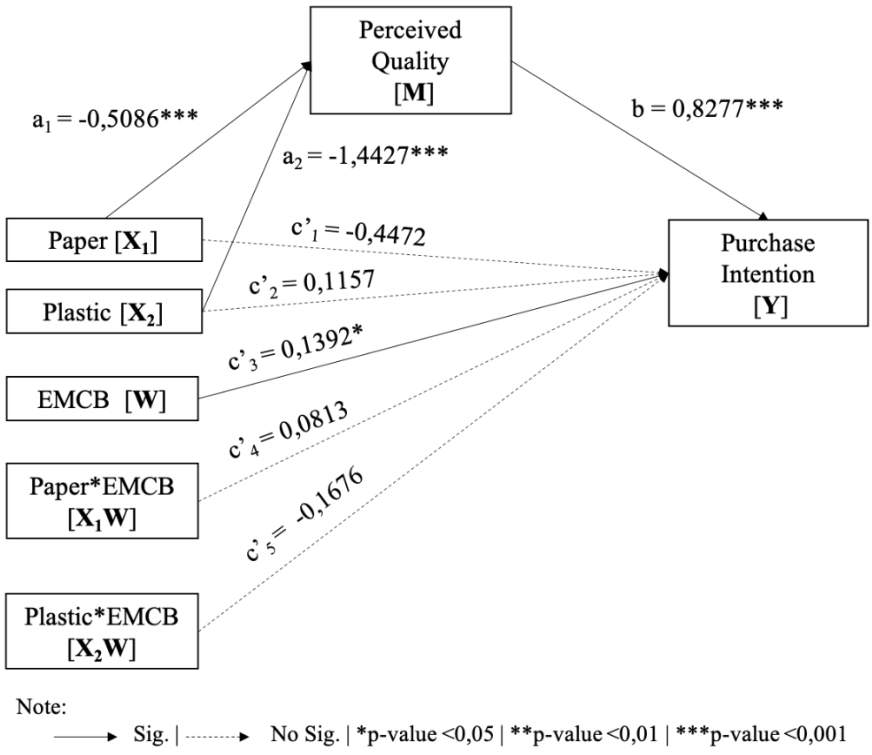

Figure 21: Full Model

CHAPTER 5: CONCLUSIONS AND LIMITATIONS

The following chapter aims to present the main findings of this dissertation also making reference to the academic and managerial implications. Lastly, the main limitations of the study will be described and topics for future research will be suggested.

5.1 Main Findings

To answer the problem statement previously formulated, each research question will be properly answered based on the main findings of the conducted analysis, using both qualitative and quantitative data and adopting a denomination for each material based on their peculiar characteristics: Glass – EF&CPQ; Paper – EF&IPQ; and Plastic – Non-EF&CPQ (§ 4.5.1).

RQ1: What is the impact of different Packaging Materials on Consumers' Purchase Intentions?

In accordance with previous studies, it is suggested that extrinsic cues (the packaging components) are considered a source of credibility for consumers when deciding on a product (Zeithaml, 1988). Being the packaging as a combination of several elements, including PM (Becker et al., 2011), it is well-accepted by literature how the packaging quality and its materials affect consumers' PIs (Siddiqui, 2019).

Based on the results of the online survey, those considerations were in part confirmed. The results have shown how the three different PM were differently perceived in terms of PI. Glass was, by far, the preferred PM in both beverages (Gin and Whisky), when compared to the other two materials, as expected to be the best choice for consumers (a PM considered EF&CPQ). However, unexpectedly, Paper registered higher PIs when compared to Plastic, in both beverages. In other words, following the methodology predefined, it can be suggested that consumers are willing to give up on a PM, which is considered as Non-EF&CPQ for EF packaging options, neglecting its capability to preserve the quality of the product itself.

This finding raises a question concerning the prioritization of the product's attributes by consumers and even suggests a paradigm change. This noticeable shift might be justified by the brainwash produced around the controversy of the impact of plastic on the planet, aligned with the change on the consumers' mindset in increasing the reliability of EF options.

RQ2: Does Perceived Quality mediates Consumers' Purchase Intention for different Packaging Materials?

In the available literature, it is argued that consumers, when conjecturing a judgment to buy an EF beverage packaging, are willing to jeopardize several products' attributes, excluding the quality of the product and the price when compared to a traditional packaging (van Birgelen et al., 2009).

The results obtained in this thesis have shown the clear effect of PQ as a mediator on the relationship between different PM and PIs. Considering the different materials, Glass was preferred in terms of quality. Nevertheless, the same pattern noticed on PIs results was found in terms of PQ, being Paper better perceived when compared to Plastic. As mentioned before, this study suggests that consumers are adopting a different behavior when evaluating Paper and Plastic as possible PM for this type of beverage. This new way of thinking and act could also be justified by the trust associated with the well-planned plan by manufacturing producers once these products are considered of quality. In this way, Paper is the PM that is more accepted by consumers, in contrast to Plastic, which is excluded for environmental reasons as stated before.

RQ2a: Do Purchase Intention and Perceived Quality differ across Packaging Materials for different beverages?

This study included two different beverages on three different PM, by adopting the same bottle design to avoid possible biases, to evaluate their impact on consumer's choices. The results obtained show that only Plastic is perceived differently for Gin and Whisky. It was found that consumers have a higher tendency to accept a Gin on a plastic bottle rather than a Whisky.

RQ3: How does Ethically Minded Consumer Behavior impact the Consumers' Purchase Intention for different beverage Packaging Materials?

For this investigation, the variable EMCB was chosen to measure the effective behavior of consumers concerning (1) their choices when facing EF options vs. a traditional one; (2) recycling behavior; (3) the effective behavior when considering a social or environmentally conscious product; and (4) willingness to pay for an ethical product (Sudbury-Riley & Kohlbacher, 2016), an aggregation of behaviors expected to impact the relationship between PM and PI. According to the results obtained in the online survey, the EMCB variable was proven to have a significant effect on how consumers perceive Glass as PM, preference expressed by their PI. Consumers with distinct levels of EMCB differ significantly on their PI concerning Glass. However, EMCB was not proven to be considered a moderator when deciding for different PM.

5.2 Academic and Managerial Implications

In terms of academic implications, this dissertation sheds light on the lack of investigation for understanding how different PM are perceived differently across consumers and how perceptions influence their PIs. This study evidence how consumers evaluate seven different PM according to their EF and CPQ of the product and those considerations can be translated into PIs. Moreover, this investigation highlights the impact of PQ as a mediator of this relationship between different PM and their PIs, and how close is EMCB to be a moderator for consumers when deciding on different PM.

For managerial implications, several aspects should be mentioned. Firstly, this investigation evidences a change of paradigm in consumers' decisions when looking for this type of beverage packaged in different PM. Glass seems to be the preferred PM, which can be justified by its long traditional use in Gin and Whisky bottles. However, it is also evident that consumers tend to prefer Paper, which is perceived as EF over Plastic, representing a Non-EF PM. As a consequence, this shift must be taken into account in this industry. Furthermore, this finding might also be why big players in this industry are opting for Paper, being considered an EF PM. Secondly, for companies operating in this industry, the attention on showing the PM' quality to consumers should not be neglected since this variable was considered crucial on consumers' decisions. In this way, marketers should keep finding innovative ways to reflect product quality through advertising strategies (Steenkamp, 1990), especially when promoting EF PM due to their novelty on the market. Lastly, aligned with EF PM' usage, an opportunity can also be recognized by presenting the benefits of new EF PM, raising awareness of these new PM, and contributing to sustainable practices.

5.3 Limitations and Further Research

Due to the nature of this study, several limitations must be mentioned.

The main limitation of this study is the lack of field experience. This field experience could have added value to the study by allowing participants to interact directly with the product and, therefore, obtain real perceptions regarding the different PM. This limitation was justified by the restrictions of time and financial support.

Secondly, as a result of the current pandemic situation worldwide and the consequent restrictions on limiting the physical contacts to the essential, other limitations came out. The group activities, such as focus groups, conducted through online meetings restricted in a way the interactions between participants. This limitation precluded the opportunity to know each

other better through ice breaker activities in person. However, an online adaptation of those activities was conducted to contribute to a relaxed environment. Another limitation has to do with the evaluation of the purchasing and consumption habits. The collected data might not express the common practices, but rather the habits of the "new normal", reflecting the new patterns regarding alcoholic beverages.

Furthermore, it is also worthy of mentioning the impossibility of using a sample that was representative of the real universe of consumers of this type of beverage. Most of the respondents were young adults, employed, and with a higher education degree. This profile reflects only a slight part of the universe of alcoholic beverage consumers. To overcome this limitation, the study could be repeated by using a more representative population with a greater diversity of participants' profiles.

The fact that this study only uses two variables can also be considered a limitation. There are other variables that have an impact on consumers' decision-making. Starting with price, this variable is crucial in the decision-making process in a real situation. In accordance with past literature, it is consensual that the first variable that consumers take into account when deciding on a beverage is the price (van Birgelen et al., 2009). The brand effect and its sequential effects, such as image associations and loyalty standards, are also relevant. Several respondents of the online survey and interviews shared their state of view by stating that their willingness to buy this type of beverage is in part based on the brand. For this study, two different and fictitious brands were created to avoid potential biases from existing brands on perceiving the PM. As a consequence, further research can be done to understand how existing brands have an impact on the perceptions of the quality of different PM and how price influences consumer decision-making.

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APPENDICES

Appendix 1: Focus Group – Participants Demographics

#	Name	Gender	Nationality	Education	Age
1	Afonso	Male	Portuguese	Bachelor's degree	24
2	Daniel	Male	Brazilian	Bachelor's degree	24
3	Fosha	Female	Italian	Bachelor's degree	22
4	Henrique	Male	Portuguese	Bachelor's degree	22
5	Sofia	Female	Portuguese	Bachelor's degree	22
6	Jessica	Female	Dutch	Bachelor's degree	22
7	Inês	Female	Portuguese	Bachelor's degree	23
8	Märc	Male	German	Bachelor's degree	24
9	Rita	Female	Portuguese	Bachelor's degree	22
10	Lisa	Female	Portuguese	Bachelor's degree	22
11	Yasin	Male	Swiss	Bachelor's degree	22

Appendix 2: Focus Group – Discussion Guide

Part 1 – Introduction	
Warm-up and moderator introduction	▪ Warm-up – Moderator welcomes everyone and appreciate their time and attention in attending to the activity ▪ Research purpose presentation – Understand participants perceptions towards different packaging materials for beverages, according to their environmental friendless and capability to preserve the quality of the product
Rules and Guidelines	▪ Time of the session – Around 60 minutes ▪ Roles of conduct – One person must speak at a time, there are no right and wrong answers, and all opinions are of great importance ▪ Request to record the meeting – The moderator confirms if everyone is comfortable in recording the meeting and enlight about the confidentiality of the data. ▪ Personal presentation of the moderator ▪ Participants presentation – Each participant is asked to present themselves by saying their name, age, nationality and current occupation
Part 2 – Individual Assessment	
Introduction	▪ Explanation of the activity – A list of packaging materials will be presented, and each participant has to rate them both using a rate from 1 to 7 regarding to different topics ▪ Request for an individual moment – Each participant should keep his/her answer private without sharing it with the rest of the group
Activity	▪ Presentation of the list of materials – A list of seven different packaging material is presented to participants ▪ Presentation of the topics to be evaluated – Each packaging material must be evaluated according to its "Environmental Friendliness" and "Capability to Preserve the Quality" ▪ Measurement and Procedure – Classify *Environmental Friendliness* from 1 = "Very environmentally unfriendly"; 2 = "Environmentally unfriendly"; 3 = "Neutral"; 4 = "Environmentally Friendly" to 5 = "Very environmentally friendly.", Classify *Capability to Preserve the Quality* from 1 = "Very poor capability"; 2 = "Poor capability"; 3 = "Neutral"; 4 = "Good capability" to 5 = "Excellent capability".
Part 3 – Role Playing	

Introduction	▪ Explanation of the activity – Three different scenarios will be presented with different backgrounds/characteristics and the group as to decide on one specific packaging material for each situation
Activity	▪ Brainstorm – The moderator should read each scenario and promote an open and trustworthy environment to make participants comfortable to share their ideas ▪ Scenario 1: Mary has to buy a beverage for today's dinner at her grandfather's house. Her grandfather is a person who enjoys a high-quality beverage with a strong flavor. Which packaging material should Mary consider when choosing a beverage? (Goal: find the packaging material perceived as Non-EF&CPQ) ▪ Scenario 2: Peter has to buy a beverage for his lunch with Anna, his girlfriend. Anna is a person who really cares about the environment and also likes a beverage with quality. Which packaging material should Mary consider when choosing a beverage? (Goal: find the packaging material perceived as EF&CPQ) ▪ Scenario 3: Jessica has to buy a beverage for tonight. She will go to her friends' house for dinner. Her friends care about ecological options, but they do not care about the quality of the beverage. Which packaging material should Mary consider when choosing a beverage? (Goal: find the packaging material perceived as EF&IPQ)
Part 4 – Closure and Thank you	
Final appreciation and Q&A	▪ Final Appreciation – Thank participants for their contribution ▪ Q&A time – Give room for questions and answer interaction

Appendix 3: Semi-structured interviews – Participants Demographics

#	Name	Gender	Nationality	Education	Age
1	Afonso	Male	Portuguese	Bachelor's degree	24
2	Ana	Female	Portuguese	Bachelor's degree	23
3	Cristina	Female	Portuguese	PhD's degree	52
4	Filipa	Female	Portuguese	Master's degree	24
5	Fosha	Female	Italian	Bachelor's degree	22
6	Gonçalo	Male	Portuguese	Bachelor's degree	22
7	Jessica	Female	Dutch	Bachelor's degree	22
8	Léa	Female	French	Bachelor's degree	22
9	Manuel	Male	Portuguese	PhD's degree	53
10	Maria	Female	Portuguese	Bachelor's degree	54
11	Rita	Female	Portuguese	Bachelor's degree	22
12	Sofia	Female	Portuguese	Master's degree	68
13	Vasco	Male	Portuguese	High School	17
14	Yasin	Male	Swiss	Bachelor's degree	22

Appendix 4: Online Survey

Introduction

Dear Participant,

Before anything else, I would like to thank you in advance for participating in this survey. This questionnaire aims to understand your perceptions regarding the alcoholic beverages industry. Please be as authentic as possible when answering the questions by expressing your unique preferences.

There are no right or wrong answers, and your opinion is of great relevance. It is also important to mention that your answers are anonymous, and the data collected will be strictly used for the purpose of my thesis.

The survey will not take more than 6 minutes to complete. For further clarifications or observations, please contact me through my email address: carolinagamacp@hotmail.com.

Thank you for your time and attention!

Block 1 – Screening Questions

Q1 – Are you 18 years old or older?

- Yes (1)
- No (2)

In the case of the respondent select "No", skip directly to the end of the survey.

Q2 – Have you bought alcoholic beverages in the past year?

- Yes (1)
- No (2)

In the case of the respondent select "No", skip directly to the end of the survey.

Block 2 – Habits and Drivers of Consumption

Q3 – How often do you buy alcoholic beverages (for you, family or friends)?

- Daily (1)
- Weekly (2)
- Montly (3)
- Quartely (4)
- Every six months (5)
- Annually (6)

Q4 – Under which circumstances do you purchase alcoholic beverages? (Choose all that apply)

- To consumer on my own (1)
- To consume with friends and family (2)
- To offer as a gift (3)

In the case of the respondent select "To consumer on my own", skip to the next question, 4.1

In the case of the respondent select "To consume with my friends and family", skip to Q4.2.

Q4.1 – Under which circumstances do you consume alcoholic beverages by your own? (Choose all that apply)

- At home (1)
- Outside home during meals (restaurants) (2)
- Outside home without meals (bars, pubs, etc) (3)

Q4.2 – Under which circumstances do you consume alcoholic beverages with friends and family? (Choose all that apply)

- At home
- Outside home during meals (restaurants)
- Outside home without meals (bars, pubs, etc)

Block 3 – Ethically Minded Consumer Behavior

Q5 – Considering all type of products (drinks, food, clothes, etc), please classify the following statements using the scale from "Never" to "Always", in accordance with your daily life behaviors.

Items	Never (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Always (7)
When there is a choice, I always choose the product that contributes to the least amount of environmental damage							
I have switched products for environmental reasons							
If I understand the potential damage to the environment that some products can cause, I do not purchase those products							
I do not buy household products that harm the environment							
Whenever possible, I buy products packaged in reusable or recyclable containers							
I make every effort to buy paper products (toilet paper, tissues, etc.) made from recycled paper							
I will not buy a product if I know that the company that sells							

it is socially irresponsible							
I do not buy products from companies that I know who use sweatshop/forced labor, child labor, or other poor working conditions							
I have paid more for environmentally friendly products when there is a cheaper alternative							
I have paid more for socially responsible products when there is a cheaper alternative							

Block 4 – Randomization and attribution of one stimulus

Please imagine yourself at the supermarket looking for a Gin/Whisky to buy. (In case you do not like this beverage, imagine that you are buying it for a friend or family member). When searching at the alcoholic beverages' shelf, you look at the bottle of Gin presented below. After evaluating carefully, the bottle, please answer the next questions.

Block 4.1 – Manipulation check

Q6 – What is the packaging material of the previous beverage? Please classify each material, using a scale, from "Disagree" to "Agree".

Materials	Disagree (1)	Neutral (2)	Agree (3)
Glass			
Paper			
Plastic			

Q7 – How much do you think this packaging material is environmentally friendly, from 1 = "Environmental irresponsible" to 5 = "Environmental responsible?

Q8 – How much do you think this packaging material is capable to preserve the quality of the product, from 1 = "Poor capability" to 5 = "High capability"?

Block 4.2 – Perceived Quality

Q9 – Please classify each statement, using a rating scale, from "Strongly disagree" to "Strongly agree".

Items	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
This beverage with this packaging							

material is of high quality							
This beverage with this packaging material is reliable							
This beverage with this packaging material is superior							
This beverage with this packaging material is of very bad quality							

Block 4.3 – Purchase Intention

Q10 – Please classify each statement, using a rating scale, from "Strongly disagree" to "Strongly agree".

Items	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
If this beverage is available with this packaging material, I will try to buy one							
If I choose again, I will still buy this beverage with this packaging material							
I try to buy this beverage with this packaging material because it is the best choice							

I think I am a loyal customer of this beverage with this packaging material							
I'm happy to buy this beverage with this packaging material							

Block 5 – Demographics

Q11 – What is your gender?

- Male
- Female

Q12 - To which age group do you belong to?

- 18-24 years old
- 25-43 years old
- 44-55 years old
- 56-74 years old
- 75 years old or older

Q13 – What is your nationality?

- Portuguese
- German
- Italian
- Spanish
- Dutch
- French
- Other: _____

Q14 – What is the highest education level you have completed?

- High school diploma
- Bachelor's degree
- Master's degree
- Ph.D degree

Q15 – What is your current occupation?

- Student
- Student-worker
- Employed
- Unemployed
- Retired

Q16 – What is the gross monthly income (before tax) of your household?

- Less than 500€
- 500€ - 1000€
- 1001€-2000€
- 2001€-3000€
- 3001€-4000€
- 4001€-5000€
- More than 5000€

Block 6 – Final Message

Thank you for your time spent taking this survey. Your response has been recorded.

Did you know that Johnnie Walker is launching a paper-based Whisky bottle at the beginning of next year? This environmental shift in the alcoholic beverage industry was the inspiration for this study.

Appendix 5: Construct Details

Constructs				
	Autor	Journal	Number of items	Description
Purchase Intention	(Chang et al., 2020) (adapted from Lee et al., (2010) and Yazdan panah et	International Journal of Environmental Research and Public Health	5	If (functional beverages) are available, I will try to buy one.
				If I choose again, I will still buy (functional beverages).
				I try to buy (functional beverages) because they are the best choice.
				I think I am a loyal customer of (functional beverages).
				I'm happy to buy (functional beverages).

	al., (2015))			
Perceived Quality	(Bao et al., 2011) (adapted from Grewal et al. (1998) and Keller & Aaker (1992))	Journal of Business Research	4	This (product) is of low quality/high quality
				This (product) is not at all reliable/very reliable
				This (product) is an inferior product/superior product
				This (product) is of very bad quality/very good quality (reversed item)
Ethically Minded Consumer Behavior	(Sudbury-Riley, 2016) (adapted from Roberts, (1993, 1995, 1996a 1996b))	Journal of Business Research	10	When there is a choice, I always choose the product that contributes to the least amount of environmental damage.
				I have switched products for environmental reasons.
				If I understand the potential damage to the environment that some products can cause, I do not purchase those products.
				I do not buy household products that harm the environment.
				Whenever possible, I buy products packaged in reusable or recyclable containers.
				I make every effort to buy paper products (toilet paper, tissues, etc.) made from recycled paper.
				I will not buy a product if I know that the company that sells it is socially irresponsible.
				I do not buy products from companies that I know use sweatshop labor, child labor, or other poor working conditions.
				I have paid more for environmentally friendly products when there is a cheaper alternative.
				I have paid more for socially responsible products when there is a cheaper alternative.

Appendix 6: Main Study – Demographics

Frequency Statistics (%)									
Description			S1	S2	S3	S4	S5	S6	**Total**
Gender	Male		38,1	32,3	29,7	34,2	34,5	30,9	**33,4**
	Female		61,9	67,7	70,3	65,8	65,5	69,1	**66,6**
Age	18-24		58,8	54,8	61,5	63,2	47,1	63,2	**57,8**
	25-43		22,7	16,1	13,2	21,1	21,8	16,2	**18,6**
	44-55		13,3	19,4	14,3	11,8	18,4	11,8	**15,0**
	56-74		5,2	7,5	9,9	3,9	10,4	8,8	**7,6**
	75 or older		-	2,2	1,1	-	2,3	-	**1,0**
Nationality	Portuguese		99,0	88,0	95,6	94,7	93,2	97,0	**94,5**
	European excluding portuguese		1,0	6,6	4,4	1,4	3,4	3,0	**3,4**
	Outside of Europe		-	5,4	-	3,9	3,4	-	**2,1**
Occupation	Student		40,2	48,4	34,1	42,1	35,7	38,2	**39,8**
	Student-worker		11,3	5,4	17,6	15,8	12,6	13,2	**12,5**
	Employed		43,3	37,6	42,8	40,8	43,7	42,7	**41,8**
	Unemployed		5,2	4,3	3,3	-	2,3	5,9	**3,6**
	Retired		-	4,3	2,2	1,3	5,7	-	**2,3**
Education level	High School		14,4	20,4	15,4	17,1	20,7	14,7	**17,2**
	Bachelor's degree		60,8	52,7	57,1	59,2	59,8	75,0	**60,2**
	Master's degree		21,7	24,7	26,4	21,1	16,1	10,3	**20,5**
	Ph.D degree		3,1	2,2	1,1	2,6	3,4	-	**2,1**
Gross monthly income	Low	Less than 500€	5,2	7,	3,3	7,9	5,7	1,5	**5,2**
		500€ - 1000€	6,2	9,7	9,9	10,5	11,6	8,8	**9,4**
	Medium	1001€ - 2000€	23,7	21,5	19,8	28,9	23,0	32,4	**24,4**
		2001€ - 3000€	21,6	25,8	28,5	25,0	25,3	22,0	**24,8**
		3001€ - 4000€	15,5	18,3	13,2	5,3	14,9	14,7	**13,9**
	High	4001€ - 5000€	10,3	8,6	9,9	10,6	9,2	8,8	**9,6**
		More than 5000€	17,5	8,6	15,4	11,8	10,3	11,8	**12,7**

Appendix 7: Main Study – Habits and Drives of consumption

Habits & Drivers of Consumption (%)								
Description		S1	S2	S3	S4	S5	S6	Total
Buying Habits	Daily	-	2,2	-	-	-	-	**0,4**
	Weekly	35,1	26,9	31,9	28,9	34,5	26,4	**30,9**
	Montly	42,3	38,6	47,2	36,8	37,9	39,7	**40,6**
	Quarterly	19,5	22,6	8,8	18,4	16,1	20,6	**17,6**
	Every six months	3,1	6,5	8,8	12,0	10,4	7,4	**7,8**
	Annually	-	3,2	3,3	3,9	1,1	5,9	**2,7**
Drivers to buy	Individual consumption	22,78	23,95	21,15	20,00	25,97	21,10	**22,67**
	At home	48,48	38,75	42,62	43,18	44,93	36,36	**42,58**
	Outside home during meals (restaurants)	28,79	33,75	27,87	29,55	31,88	36,36	**31,32**
	Outside home without meals (bars, pubs, etc)	22,73	27,50	29,51	27,27	23,19	27,27	**26,10**
	To consume with friends and family	55,70	50,30	56,41	58,40	51,95	59,63	**55,01**
	At home	37,00	35,60	36,62	33,53	34,74	37,58	**35,85**
	Outside home during meals (restaurants)	31,00	33,51	32,86	32,35	34,21	29,53	**32,35**
	Outside home without meals (bars, pubs, etc)	32,00	30,89	30,52	32,35	31,05	29,53	**31,81**
	Offer as a gift	21,52	25,75	22,44	21,60	22,08	19,27	**22,32**

Appendix 8: Main Study – Cronbach's Alpha Analysis

Construct	Cronbach's Alpha	Number Of Items	Quality*
Ethically Minded Consumer Behavior (EMCB)	0,883	10	Good
Ethically Minded Consumer Behavior in S1	0,860	10	Good
Ethically Minded Consumer Behavior in S2	0,875	10	Good
Ethically Minded Consumer Behavior in S3	0,897	10	Excellent

Ethically Minded Consumer Behavior in S4	0,879	10	Good
Ethically Minded Consumer Behavior in S5	0,897	10	Excellent
Ethically Minded Consumer Behavior in S6	0,882	10	Good
Perceived Quality (PQ)	0,874	4	Good
Perceived Quality in S1	0,787	4	Acceptable
Perceived Quality in S2	0,864	4	Good
Perceived Quality in S3	0,877	4	Good
Perceived Quality in S4	0,813	4	Good
Perceived Quality in S5	0,847	4	Good
Perceived Quality in S6	0,84	4	Good
Purchase Intention (PI)	0,950	5	Excellent
Purchase Intention in S1	0,878	5	Good
Purchase Intention in S2	0,927	5	Excellent
Purchase Intention in S3	0,962	5	Excellent
Purchase Intention in S4	0,910	5	Excellent
Purchase Intention in S5	0,945	5	Excellent
Purchase Intention in S6	0,946	5	Excellent

*The Cronbach alfa was defined to varies from Unacceptable (below 0,50), Poor (between 0,50 and 0,59), Questionable (between 0,60 and 0,69), Acceptable (between 0,70 and 0,79), Good (between 0,80 and 0,89) and Excellent (above 0,9) (George, D., & Mallery, 2003).

Appendix 9: Manipulation Check – Descriptive Statistics

Descriptive Statistics							
			N	Minimum	Maximum	Mean	Std. Deviation
Gin	Glass	Glass	97	1	3	2,91	0,384
		Paper	97	1	3	1,49	0,818
		Plastic	97	1	3	1,67	0,813
	Paper	Glass	93	1	3	1,37	0,719
		Paper	93	1	3	2,34	0,853
		Plastic	93	1	3	1,47	0,701
	Plastic	Glass	91	1	3	1,67	0,895

		Paper	91	1	3	1,2	0,521
		Plastic	91	1	3	2,55	0,806
Whisky	Glass	Glass	76	1	3	2,96	0,255
		Paper	76	1	3	1,72	0,947
		Plastic	76	1	3	1,63	0,862
	Paper	Glass	87	1	3	1,26	0,619
		Paper	87	1	3	2,47	0,833
		Plastic	87	1	3	1,34	0,696
	Plastic	Glass	68	1	3	1,38	0,734
		Paper	68	1	3	1,18	0,517
		Plastic	68	1	3	2,81	0,58

Appendix 10: Manipulation Check – Tests of Normality – Kolmogorov-Smirnov

Tests of Normality – Kolmogorov-Smirnov			
Materials	Statistic	df	Sig.
Glass	0,536	173	0,000
Paper	0,398	180	0,000
Plastic	0,491	159	0,000

Appendix 11: Manipulation Check – Mann-Whitney U-Test

Packaging Materials						
Test Statistics	Glass		Paper		Plastic	
	Glass **vs** Paper	Glass **vs** Plastic	Paper **vs** Glass	Paper **vs** Plastic	Plastic **vs** Glass	Plastic **vs** Paper
Mann-Whitney U	2278,500	3564,000	8659,500	4642,500	5871,000	4425,000
Wilcoxon W	18568,500	16284,000	23710,500	17362,500	20922,000	20715,000
Z	-15,703	-13,562	-7,989	-12,001	-9,998	-12,120
Asymp. Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000

Appendix 12: Hypothesis – Tests of Normality – Kolmogorov-Smirnov

Tests of Normality – Kolmogorov-Smirnov							
Stimuli		Perceived Quality			Purchase Intention		
		Statistic	df	Sig.	Statistic	df	Sig.
Gin	Glass (S1)	0,113	97	0,004	0,107	97	0,009
	Paper (S2)	0,115	93	0,004	0,09	93	0,059
	Plastic (S3)	0,115	91	0,005	0,088	91	0,082
Whisky	Glass (S4)	0,098	76	0,070	0,12	76	0,008
	Paper (S5)	0,084	87	0,182	0,081	87	0,001
	Plastic (S6)	0,11	68	0,041	0,141	68	0,002

Appendix 13: Hypothesis – Levene's Test for Equality of Variances – PQ

Levene's Test for Equality of Variances – Perceived Quality				
			F	Sig.
Whisky	S4 & S5	Equal variance assumed	4,026	0,040
		Equal variances not assumed		

Appendix 14: Hypothesis – Levene's Test for Equality of Variances – PI

Levene's Test for Equality of Variances – Purchase Intention				
			F	Sig.
Gin	S2 & S3	Equal variance assumed	22,868	0,000
		Equal variances not assumed		

Appendix 15: Hypothesis 1.a – PQ

Perceived Quality				
	Gin		Whisky	
	Glass (S1)	Paper (S2)	Glass (S4)	Paper (S5)
Descriptives				

N	97	93	76	87
Mean	5,150	4,715	5,151	4,563
Standard Deviation	0,989	1,061	0,980	1,191
Mann-Whitney Test				
N	97	93	76	87
Mean Rank	106,46	84,06	94,31	71,25
Sum of Ranks	10327,00	7818,00	7167,50	6198,50
Test Statistics				
Mann-Whitney U	3447,000		2370,500	
Wilcoxon W	7818,000		6198,500	
Z	-2,818		-3,122	
Asymp. Sig. (2-tailed)	0,005		0,002	
Hypothesis Result	Accepted		Accepted	

Appendix 16: Hypothesis 1.b – PI

Purchase Intention				
	Gin		Whisky	
	Glass (S1)	Paper (S2)	Glass (S4)	Paper (S5)
Descriptives				
N	97	93	76	87
Mean	5,039	4,480	4,847	4,425
Standard Deviation	1,044	1,126	1,296	1,396
Mann-Whitney Test				
N	97	93	76	87
Mean Rank	108,75	81,68	90,07	74,95
Sum of Ranks	10549,00	7596,00	6845,00	6521,00
Test Statistics				
Mann-Whitney U	3225,000		2693,000	
Wilcoxon W	7596,000		6521,000	

Z	-3,403	-2,043
Asymp. Sig. (2-tailed)	0,001	0,041
Hypothesis Result	Accepted	Accepted

Appendix 17: Hypothesis 2.a – PQ

Perceived Quality				
	Gin		Whisky	
	Glass (S1)	Plastic (S3)	Glass (S4)	Plastic (S6)
Descriptives				
N	97	91	76	68
Mean	5,150	3,890	5,151	3,463
Standard Deviation	0,989	1,362	0,979	1,171
Mann-Whitney Test				
N	97	91	76	68
Mean Rank	118,47	68,95	96,91	45,22
Sum of Ranks	11491,50	6274,50	7365,00	3075,00
Test Statistics				
Mann-Whitney U	2088,500		729,000	
Wilcoxon W	6274,500		3075,000	
Z	-6,252		-7,441	
Asymp. Sig. (2-tailed)	0,000		0,000	
Hypothesis Result	Accepted		Accepted	

Appendix 18: Hypothesis 2.b – PI

Purchase Intention				
	Gin		Whisky	
	Glass (S1)	Plastic (S3)	Glass (S4)	Plastic (S6)
Descriptives				

N	97	91	76	68
Mean	5,039	3,455	4,847	2,765
Standard Deviation	1,044	1,7249	1,296	1,462
Mann-Whitney Test				
N	97	91	76	68
Mean Rank	119,42	67,94	96,53	45,64
Sum of Ranks	11583,50	6182,50	7336,50	3103,50
Test Statistics				
Mann-Whitney U	1996,500		757,500	
Wilcoxon W	6182,500		3103,500	
Z	-6,495		-7,319	
Asymp. Sig. (2-tailed)	0,000		0,000	
Hypothesis Result	Accepted		Accepted	

Appendix 19: Hypothesis 3.a – PQ

Perceived Quality				
	Gin		Whisky	
	Paper (S2)	Plastic (S3)	Paper (S5)	Plastic (S6)
Descriptives				
N	93	91	87	68
Mean	4,715	3,890	4,563	3,463
Standard Deviation	1,061	1,361	1,191	1,1712
Mann-Whitney Test				
N	93	91	87	68
Mean Rank	118,02	76,64	94,22	57,25
Sum of Ranks	10045,50	6974,50	8197,00	3893,00
Test Statistics				
Mann-Whitney U	2788,500		1547,000	
Wilcoxon W	6974,500		3893,000	

Z	-4,011	-5,100
Asymp. Sig. (2-tailed)	0,000	0,000
Hypothesis Result	Rejected	Rejected

Appendix 20: Hypothesis 3.b – PI

Purchase Intention				
	Gin		Whisky	
	Paper (S2)	Plastic (S3)	Paper (S5)	Plastic (S6)
Descriptives				
N	93	91	87	68
Mean	4,480	3,455	4,425	2,765
Standard Deviation	1,126	1,725	1,396	1,462
Mann-Whitney Test				
N	97	91	87	68
Mean Rank	109,91	74,71	98,08	52,31
Sum of Ranks	10221,50	6798,50	8533,00	3557,00
Test Statistics				
Mann-Whitney U	2612,500		1211,000	
Wilcoxon W	6798,500		3557,000	
Z	-4,488		-6,308	
Asymp. Sig. (2-tailed)	0,000		0,000	
Hypothesis Result	Rejected		Rejected	

Appendix 21: Beverages Testing – PQ

Perceived Quality						
	Glass		Paper		Plastic	
	Gin (S1)	Whisky (S4)	Gin (S2)	Whisky (S5)	Gin (S3)	Whisky (S6)
Descriptives						

N	97	76	93	87	91	68
Mean	5,15	5,151	4,715	4,563	3,89	3,463
Standard Deviation	0,989	0,98	1,061	1,191	1,362	1,171
Mann-Whitney Test						
N	97	76	93	87	91	68
Mean Rank	88,11	85,58	94,02	86,74	86,46	71,35
Sum of Ranks	8547,0	6504,0	8744,0	7546,0	7868,0	4852,0
Test Statistics						
Mann-Whitney U	3578,00		3718,00		2506,00	
Wilcoxon W	6504,00		7546,00		4852,00	
Z	-0,332		-0,941		-2,052	
Asymp. Sig. (2-tailed)	0,740		0,347		0,040	
Result	Not statistically significant		Not statistically significant		Statistically Significant	

Appendix 22: Beverages Testing – PI

Purchase Intention						
	Glass		Paper		Plastic	
	Gin (S1)	Whisky (S4)	Gin (S2)	Whisky (S5)	Gin (S3)	Whisky (S6)
Descriptives						
N	97	76	93	87	91	68
Mean	5,039	4,847	4,48	4,425	3,455	2,765
Standard Deviation	1,044	1,296	1,126	1,396	1,7249	1,462
Mann-Whitney Test						
N	97	76	93	87	91	68
Mean Rank	89,20	84,19	91,13	89,82	87,54	69,91
Sum of Ranks	8652,5	6398,5	8475,5	7814,5	7966,0	4754,0
Test Statistics						

Mann-Whitney U	3472,50	3986,50	2408,00
Wilcoxon W	6398,500	7814,50	4754,00
Z	-0,656	-0,169	-2,394
Asymp. Sig. (2-tailed)	0,512	0,866	0,017
Result	Not statistically significant	Not statistically significant	Statistically Significant

Appendix 23: Mediation (PQ) – Model 4

Run MATRIX procedure:

```
***************** PROCESS Procedure for SPSS Version 3.5 *****************

        Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 4
   Y  : Mean_PI
   X  : Material
   M  : Mean_PQ

Sample
Size:  512

Coding of categorical X variable for analysis:
 Material       X1       X2
    1.000     .000     .000
    2.000    1.000     .000
    3.000     .000    1.000

**************************************************************************
OUTCOME VARIABLE:
 Mean_PQ

Model Summary
        R       R-sq        MSE          F        df1        df2          p
     .4597      .2113     1.2932    68.1771     2.0000   509.0000      .0000

Model
            coeff         se          t          p       LLCI       ULCI
constant   5.1503      .0865    59.5684      .0000     4.9804     5.3202
X1         -.5086      .1211    -4.2008      .0000     -.7465     -.2707
```

```
X2        -1.4427     .1249   -11.5479     .0000    -1.6882    -1.1973

Standardized coefficients
       coeff
X1     -.3980
X2    -1.1289

Covariance matrix of regression parameter estimates:
          constant        X1        X2
constant     .0075    -.0075    -.0075
X1          -.0075     .0147     .0075
X2          -.0075     .0075     .0156

**************************************************************************
OUTCOME VARIABLE:
 Mean_PI

Model Summary
        R      R-sq       MSE         F       df1       df2         p
     .7824     .6121     .9374   267.2342    3.0000   508.0000     .0000

Model
            coeff         se         t         p      LLCI      ULCI
constant     .6052     .2078     2.9118     .0038     .1968     1.0135
X1          -.0720     .1049     -.6868     .4925    -.2780     .1340
X2          -.5767     .1195    -4.8261     .0000    -.8114    -.3419
Mean_PQ      .8446     .0377    22.3806     .0000     .7704     .9187

Standardized coefficients
           coeff
X1         -.0465
X2         -.3720
Mean_PQ     .6963

Covariance matrix of regression parameter estimates:
          constant        X1        X2    Mean_PQ
constant     .0432    -.0091    -.0160    -.0073
X1          -.0091     .0110     .0065     .0007
X2          -.0160     .0065     .0143     .0021
Mean_PQ     -.0073     .0007     .0021     .0014

Test(s) of X by M interaction:
         F       df1        df2         p
    3.8039    2.0000   506.0000     .0229

************************ TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 Mean_PI
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.4792	.2297	1.8580	75.8812	2.0000	509.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	4.9549	.1036	47.8120	.0000	4.7513	5.1585
X1	-.5016	.1451	-3.4561	.0006	-.7867	-.2165
X2	-1.7952	.1498	-11.9877	.0000	-2.0894	-1.5010

Standardized coefficients

	coeff
X1	-.3236
X2	-1.1582

Covariance matrix of regression parameter estimates:

	constant	X1	X2
constant	.0107	-.0107	-.0107
X1	-.0107	.0211	.0107
X2	-.0107	.0107	.0224

********** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **********

Relative total effects of X on Y:

	Effect	se	t	p	LLCI	ULCI	c_ps
X1	-.5016	.1451	-3.4561	.0006	-.7867	-.2165	-.3236
X2	-1.7952	.1498	-11.9877	.0000	-2.0894	-1.5010	-1.1582

Omnibus test of total effect of X on Y:

R2-chng	F	df1	df2	p
.2297	75.8812	2.0000	509.0000	.0000

Relative direct effects of X on Y

	Effect	se	t	p	LLCI	ULCI	c'_ps
X1	-.0720	.1049	-.6868	.4925	-.2780	.1340	-.0465
X2	-.5767	.1195	-4.8261	.0000	-.8114	-.3419	-.3720

Omnibus test of direct effect of X on Y:

R2-chng	F	df1	df2	p
.0212	13.8600	2.0000	508.0000	.0000

Relative indirect effects of X on Y

Material -> Mean_PQ -> Mean_PI

```
      Effect     BootSE   BootLLCI   BootULCI
X1    -.4296      .0964    -.6182    -.2379
X2   -1.2185      .1137   -1.4416    -.9980
```

Partially standardized relative indirect effect(s) of X on Y:

```
 Material    ->    Mean_PQ     ->    Mean_PI

      Effect     BootSE   BootLLCI   BootULCI
X1    -.2771      .0614    -.3981    -.1548
X2    -.7861      .0648    -.9103    -.6607
```

********************** ANALYSIS NOTES AND ERRORS **********************

Level of confidence for all confidence intervals in output:
 95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
 5000

NOTE: Standardized coefficients for dichotomous or multicategorical X are in
     partially standardized form.

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

Appendix 24: Moderation (EMCB) – Model 1

Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 3.5 *****************

        Written by Andrew F. Hayes, Ph.D.   www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

****
Model : 1
   Y : Mean_PI
   X : Material
   W : EMCB

Sample
Size: 512

Coding of categorical X variable for analysis:
 Material   X1   X2

```
   1.000     .000     .000
   2.000    1.000     .000
   3.000     .000    1.000

************************************************************************
OUTCOME VARIABLE:
 Mean_PI

Model Summary
        R       R-sq        MSE          F        df1        df2          p
     .5118      .2619     1.7908    35.9100     5.0000   506.0000      .0000

Model
            coeff         se          t          p       LLCI       ULCI
constant    3.9196      .4143     9.4609      .0000     3.1057     4.7336
X1          -.9659      .5720    -1.6886      .0919    -2.0897      .1579
X2          -.7295      .5878    -1.2410      .2152    -1.8843      .4254
EMCB         .2446      .0949     2.5778      .0102      .0582      .4310
Int_1        .1013      .1294      .7828      .4341     -.1530      .3556
Int_2       -.2514      .1308    -1.9222      .0551     -.5083      .0056

Product terms key:
 Int_1    :       X1       x       EMCB
 Int_2    :       X2       x       EMCB

Covariance matrix of regression parameter estimates:
          constant         X1         X2       EMCB      Int_1      Int_2
constant      .1716     -.1716     -.1716     -.0381      .0381      .0381
X1           -.1716      .3272      .1716      .0381     -.0717     -.0381
X2           -.1716      .1716      .3455      .0381     -.0381     -.0744
EMCB         -.0381      .0381      .0381      .0090     -.0090     -.0090
Int_1         .0381     -.0717     -.0381     -.0090      .0167      .0090
Int_2         .0381     -.0381     -.0744     -.0090      .0090      .0171

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0120     4.1198     2.0000   506.0000      .0168
----------
    Focal predict: Material (X)
          Mod var: EMCB     (W)

Conditional effects of the focal predictor at values of the moderator(s):

Moderator value(s):
```

EMCB 3.1000

	Effect	se	t	p	LLCI	ULCI
X1	-.6518	.2090	-3.1189	.0019	-1.0625	-.2412
X2	-1.5087	.2205	-6.8424	.0000	-1.9419	-1.0755

Test of equality of conditional means

F	df1	df2	p
23.4206	2.0000	506.0000	.0000

Estimated conditional means being compared:

Material	Mean_PI
1.0000	4.6778
2.0000	4.0260
3.0000	3.1691

Moderator value(s):
EMCB 4.5000

	Effect	se	t	p	LLCI	ULCI
X1	-.5100	.1454	-3.5068	.0005	-.7958	-.2243
X2	-1.8606	.1492	-12.4709	.0000	-2.1537	-1.5675

Test of equality of conditional means

F	df1	df2	p
83.0793	2.0000	506.0000	.0000

Estimated conditional means being compared:

Material	Mean_PI
1.0000	5.0202
2.0000	4.5102
3.0000	3.1596

Moderator value(s):
EMCB 5.5000

	Effect	se	t	p	LLCI	ULCI
X1	-.4087	.2127	-1.9212	.0553	-.8267	.0092
X2	-2.1120	.2109	-10.0147	.0000	-2.5263	-1.6977

Test of equality of conditional means

F	df1	df2	p
59.5608	2.0000	506.0000	.0000

Estimated conditional means being compared:

Material	Mean_PI
1.0000	5.2648
2.0000	4.8561
3.0000	3.1528

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

```
DATA LIST FREE/
  Material   EMCB      Mean_PI    .
BEGIN DATA.
    1.0000    3.1000    4.6778
    2.0000    3.1000    4.0260
    3.0000    3.1000    3.1691
    1.0000    4.5000    5.0202
    2.0000    4.5000    4.5102
    3.0000    4.5000    3.1596
    1.0000    5.5000    5.2648
    2.0000    5.5000    4.8561
    3.0000    5.5000    3.1528
END DATA.
GRAPH/SCATTERPLOT=
 EMCB     WITH     Mean_PI  BY       Material .
```

********** ANALYSIS NOTES AND ERRORS **********
***

Level of confidence for all confidence intervals in output:
 95.0000

W values in conditional tables are the 16th, 50th, and 84th percentiles.

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

Appendix 25: Full Model – Model 5

Run MATRIX procedure:

********** PROCESS Procedure for SPSS Version 3.5 **********

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
Documentation available in Hayes (2018). www.guilford.com/p/hayes3

****

Model : 5
Y : Mean_PI
X : Material
M : Mean_PQ
W : EMCB

Sample
Size: 512

Coding of categorical X variable for analysis:

Material	X1	X2
1.000	.000	.000
2.000	1.000	.000
3.000	.000	1.000

****
OUTCOME VARIABLE:
Mean_PQ

Model Summary

R	R-sq	MSE	F	df1	df2	p
.4597	.2113	1.2932	68.1771	2.0000	509.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	5.1503	.0865	59.5684	.0000	4.9804	5.3202
X1	-.5086	.1211	-4.2008	.0000	-.7465	-.2707
X2	-1.4427	.1249	-11.5479	.0000	-1.6882	-1.1973

Covariance matrix of regression parameter estimates:

	constant	X1	X2
constant	.0075	-.0075	-.0075
X1	-.0075	.0147	.0075
X2	-.0075	.0075	.0156

****
OUTCOME VARIABLE:
Mean_PI

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7902	.6244	.9131	139.9285	6.0000	505.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.1025	.3426	.2991	.7650	-.5707	.7757
X1	-.4472	.4091	-1.0930	.2749	-1.2510	.3566
X2	.1157	.4215	.2744	.7839	-.7124	.9437
Mean_PQ	.8277	.0375	22.0776	.0000	.7541	.9014
EMCB	.1392	.0679	2.0502	.0409	.0058	.2727
Int_1	.0813	.0924	.8793	.3797	-.1003	.2628
Int_2	-.1676	.0935	-1.7938	.0734	-.3512	.0160

Product terms key:

Int_1	:	X1	x	EMCB
Int_2	:	X2	x	EMCB

Covariance matrix of regression parameter estimates:

	constant	X1	X2	Mean_PQ	EMCB	Int_1	Int_2
constant	.1174	-.0916	-.0941	-.0065	-.0186	.0196	.0188
X1	-.0916	.1674	.0884	.0009	.0193	-.0366	-.0193
X2	-.0941	.0884	.1776	.0014	.0192	-.0195	-.0378
Mean_PQ	-.0065	.0009	.0014	.0014	-.0002	.0000	.0001
EMCB	-.0186	.0193	.0192	-.0002	.0046	-.0046	-.0046
Int_1	.0196	-.0366	-.0195	.0000	-.0046	.0085	.0046
Int_2	.0188	-.0193	-.0378	.0001	-.0046	.0046	.0087

Test(s) of X by M interaction:

F	df1	df2	p
4.9345	2.0000	503.0000	.0075

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.0059	3.9458	2.0000	505.0000	.0199

Focal predict: Material (X)
Mod var: EMCB (W)

Conditional effects of the focal predictor at values of the moderator(s):
(These are also the relative conditional direct effects of X on Y)

Moderator value(s):
EMCB 3.1000

	Effect	se	t	p	LLCI	ULCI
X1	-.1953	.1507	-1.2961	.1955	-.4913	.1007
X2	-.4040	.1652	-2.4455	.0148	-.7286	-.0794

Test of equality of conditional means

F	df1	df2	p
2.9963	2.0000	505.0000	.0509

Estimated conditional means being compared:

Material	Mean_PI
1.0000	4.2783
2.0000	4.0830
3.0000	3.8743

Moderator value(s):

EMCB 4.5000

	Effect	se	t	p	LLCI	ULCI
X1	-.0815	.1056	-.7715	.4408	-.2891	.1261
X2	-.6387	.1201	-5.3201	.0000	-.8745	-.4028

Test of equality of conditional means

F	df1	df2	p
17.0035	2.0000	505.0000	.0000

Estimated conditional means being compared:

Material	Mean_PI
1.0000	4.4732
2.0000	4.3917
3.0000	3.8345

Moderator value(s):

EMCB 5.5000

	Effect	se	t	p	LLCI	ULCI
X1	-.0002	.1530	-.0016	.9987	-.3009	.3004
X2	-.8063	.1618	-4.9840	.0000	-1.1242	-.4885

Test of equality of conditional means

F	df1	df2	p
17.9434	2.0000	505.0000	.0000

Estimated conditional means being compared:

Material	Mean_PI
1.0000	4.6125
2.0000	4.6122
3.0000	3.8062

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

```
DATA LIST FREE/
  Material   EMCB      Mean_PI    .
BEGIN DATA.
    1.0000    3.1000    4.2783
    2.0000    3.1000    4.0830
    3.0000    3.1000    3.8743
    1.0000    4.5000    4.4732
    2.0000    4.5000    4.3917
    3.0000    4.5000    3.8345
    1.0000    5.5000    4.6125
    2.0000    5.5000    4.6122
    3.0000    5.5000    3.8062
END DATA.
GRAPH/SCATTERPLOT=
 EMCB     WITH     Mean_PI  BY       Material .
```

********** DIRECT AND INDIRECT EFFECTS OF X ON Y **********
**

Relative conditional direct effect(s) of X on Y:

	EMCB	Effect	se	t	p	LLCI	ULCI
X1	3.1000	-.1953	.1507	-1.2961	.1955	-.4913	.1007
X1	4.5000	-.0815	.1056	-.7715	.4408	-.2891	.1261
X1	5.5000	-.0002	.1530	-.0016	.9987	-.3009	.3004
X2	3.1000	-.4040	.1652	-2.4455	.0148	-.7286	-.0794
X2	4.5000	-.6387	.1201	-5.3201	.0000	-.8745	-.4028
X2	5.5000	-.8063	.1618	-4.9840	.0000	-1.1242	-.4885

Relative indirect effects of X on Y

Material -> Mean_PQ -> Mean_PI

	Effect	BootSE	BootLLCI	BootULCI
X1	-.4210	.0986	-.6147	-.2333
X1	-1.1942	.1131	-1.4271	-.9813

Partially standardized relative indirect effect(s) of X on Y:

Material -> Mean_PQ -> Mean_PI

	Effect	BootSE	BootLLCI	BootULCI

X1 -.2716 .0628 -.3953 -.1500
X1 -.7704 .0649 -.9042 -.6479

********** ANALYSIS NOTES AND ERRORS **********
***

Level of confidence for all confidence intervals in output:
95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
5000

W values in conditional tables are the 16th, 50th, and 84th percentiles.

NOTE: Standardized coefficients not available for models with moderators.

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