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Classic Graduating Project

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OATH OF PERSONAL WORK

I undersigned Maria Angelica SANTOS CASTRO declare that the following graduation project is my work. No part of this research has been submitted in the past for publication or for degree purposes. I am fully responsible for the truthfulness of this declaration.

Date: 31 October 2022

Signature:

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Resumen

La compatibilidad entre lujo y sostenibilidad ha sido cuestionada en la literatura durante las últimas décadas. A lo largo de los años han surgido diferentes posturas a favor y en contra. Con el creciente interés y preocupación de los consumidores por la sostenibilidad, las marcas de lujo han constatado la necesidad de implantarla en su cadena de valor. Este estudio se centra en la fabricación de productos de lujo y en las materias primas utilizadas en estos procesos. El objetivo es desvelar las percepciones de los consumidores sobre el uso de materiales cultivados en laboratorio como sustitutos de las materias primas tradicionales, centrándose en el cuero, las pieles y los diamantes cultivados en laboratorio mediante estudios de casos aplicados en LVMH y Kering. ¿Cómo podrían los productos de lujo cultivados en laboratorio ser una solución sostenible sin sacrificar la esencia y las particularidades de los productos de lujo, como la calidad, la exclusividad, el prestigio, etc.? Este estudio ofrece un análisis de las respuestas obtenidas en una entrevista aplicada a casos empresariales, que se analizaron a partir de dos modelos basados en conceptos propuestos previamente por (Mazzalovo & Chevalier, 2020). Las respuestas son evaluadas como un colectivo para obtener palabras clave y asociaciones sobre cada tema propuesto, para ser posteriormente clasificadas en cada modelo, e identificar patrones en las percepciones y asociaciones de los entrevistados. De este análisis se deduce que el "consumidor de lujo ecológico" es el consumidor ideal de productos cultivados en laboratorio en el sector del lujo. Este tipo de consumidor espera que los productos cultivados en laboratorio mantengan las características de los productos de lujo y atribuye la responsabilidad de transmitir

el equilibrio entre lujo y sostenibilidad directamente a las estrategias de marketing y comunicación aplicadas por las marcas de lujo.

Palabras clave: sostenibilidad, industria del lujo, productos cultivados en laboratorio, cuero, diamantes, piel, percepción del consumidor, estrategias de marketing, materia prima, medio ambiente.

Abstract

Compatibility between luxury and sustainability has been questioned in the literature over the past decades. Different positions both for and against have emerged throughout the years. With the increasing interest and concern of consumers for sustainability, luxury brands have remarked the necessity to implement it within their value chain. This study focuses on the manufacturing of luxury products and the raw materials used within these processes. The aim is to unveil consumers' perceptions of the use of lab-grown materials as a substitute for traditional raw materials, focusing on leather, fur, and lab-grown diamonds through applied case studies at LVMH and Kering. How could luxury lab-grown products be a sustainable solution without sacrificing the essence and characteristics of luxury products such as quality, exclusivity, prestige, etc.? This study provides an analysis of responses obtained in an interview applied to business cases, which were analyzed from two models based on concepts previously proposed by (Mazzalovo & Chevalier, 2020). Responses are evaluated as a collective to obtain keywords and associations on each proposed topic, to be subsequently classified in each model, and to identify patterns in the perceptions and associations of the interviewees. From this analysis, the "eco-luxury consumer" emerges as the ideal consumer of lab-grown products in the luxury industry. This type of consumer expects lab-grown products to maintain the characteristics of luxury products and attributes the responsibility of conveying the balance between luxury and sustainability directly to marketing and communication strategies implemented by luxury brands.

KEYWORDS: sustainability, luxury industry, lab-grown products, leather, diamonds, fur, consumer perception, marketing strategies, raw material, environment.

1. Introduction

Currently the world is going through different circumstances that need to be addressed by all industries. Meeting these needs should not compromise the welfare of future generations in the social, economic, and environmental spheres. Specifically, for the luxury industry, due to its essence and nature, sustainability represents a challenge. Especially when it comes to environmental sustainability. In an era where competition is vast and information is at the consumer's fingertips, luxury brands need to have a fully sustainable and transparent business strategy (Campos Franco et al., 2020). Being sustainable is no longer an option for anyone, it represents a risk of losing competitiveness.

Luxury has been associated for decades with excess, indulgence, and waste in different areas of lifestyle for a select few (Mazzalovo & Chevalier, 2020). Sustainability, on the other hand, focuses on the responsible and moderate consumption of resources that will ensure that future generations will be able to meet their needs on earth. Since excess and waste undoubtedly harm the objectives pursued by sustainable consumption, the contradiction is established (Lo & Ha-Brookshire, 2018).

The concept of luxury has also been associated with the exclusivity granted by the rarity in terms of the raw material with which they are made. Exotic animals, fur, and leather are the primary resources exploited by this industry, requiring methods that incur animal cruelty (Lo & Ha-Brookshire, 2018). In recent years, different luxury brands have been the focus of the world press due to various scandals related to unfair working conditions, lack of ethics, animal cruelty,

and exploitation of natural resources (Dekhili et al., 2019). For this reason, it is worth questioning whether luxury and sustainability are concepts that are sufficiently compatible to be integrated.

To ensure the implementation of sustainable measures and practices in the industry, different regulatory authorities and associations have been founded to promote sustainability. Among the best known is the Colbert Committee, an association that brings together 92 luxury houses that in recent years have been dedicated to the different activities and metiers that the committee has established: automobile, crystal, decoration, fragrances and cosmetics, gastronomy, gold and precious metal, haute couture and fashion, hospitality, leather goods, publishing, silver and bronze, sound and wines and spirits (Comite Colbert, n.d.).

This study focuses on the fashion sector, leather goods, jewelry, and precious metals. The objective is to determine consumers' perceptions towards the implementation of new materials to replace those that represent environmental and social threats and damage. For them, luxury concept changes when using lab-grown materials as substitute for traditional raw materials?

The luxury industry has characteristics and codes that must be respected to maintain its value proposition (Mihailovich, 2020). In the effort to maintain it, the industry generates a high environmental impact, especially regarding the exploitation of raw materials. At the same time, public concern about global warming is rising and companies are under pressure from all their stakeholders, including employees, to adopt clearly defined climate-related objectives for their products, services, and ways of operating (Som & Blanckaert, 2021).

Regarding the use of raw materials, the main challenge is to find sustainable alternatives that offer the same characteristics as those that are not, without sacrificing the design and quality of the products. Nowadays, due to technological advances, it has been possible to replicate and/or recycle almost any type of material. For luxury brands, it is a strategy that more than tarnishes their image, it allows them to enhance it (Campos Franco et al., 2020).

For the industry, brand reputation, image, and awareness are fundamental aspects, as they are the basis of the relationship with consumers. There are tangible and intangible brand authenticity sources that must be considered by companies to meet consumer expectations (Som & Blanckaert, 2021). In this case, as for tangibles, raw materials will be addressed. For intangibles, we will focus on the values conveyed by the companies associated with sustainability, environmental care, and eco-innovation. This study focuses on leather, animal fur, and diamonds along with their respective sustainable substitutes.

2. Literature review

Luxury Industry

According to a study conducted by (Berthon et al., 2009), luxury brands are considered to be among the most profitable and fastest growing within the different market segments. By 2024, these brands are projected to have a global growth of 70% compared to 2015 where they obtained revenues of 845bn euros, meaning that by 2024 revenues of 1,126bn euros are expected

in the personal luxury industry (accessories, apparel, watches, jewelry, perfume, and cosmetics) and experiential (furniture, food and wine, hotels and exclusive vacations). It evidences the power and economic strength it represents in the market, especially in Europe, where it is a potential booster of gross domestic product (GDP) and, additionally, a source of competitive advantage over the global market. Finally, to get a clearer sense of the magnitude of the industry, the (Boston Consulting Group, 2018) estimated that the total number of luxury consumers by 2024 is expected to reach 496 million internationally.

Regarding its characteristics, the industry is highly differentiated from the others thanks to its values and essence. As evidence is presented in its way of managing luxury companies, its codes and standards along the value chain vary strongly concerning any other segment, in this lies the main challenge of the industry (Som & Blanckaert, 2021). (Mazzalovo & Chevalier, 2020) states that to be successful in this industry, luxury marketers must do the complete opposite of what is established in traditional marketing. (Dubois et al., 2001) established six determining success factors for the management and strategic approach of these companies, these are high price, high cost, craftsmanship, limited distribution, low promotional activity, and advertising with no sophisticated copy strategy. Finally, it is worth mentioning and adding the importance of a strong brand identity, heritage, and creativity.

Sustainability concerning the luxury industry

Different reports, studies, and market researchers point to sustainability as the main emerging trend with the strongest future influence on the luxury industry and market (Islam et al., 2021). However, when returning to the factors established by (Dubois et al., 2001), it seems

impossible to refer to sustainability within the luxury industry. In the existing literature, some positions argue for the compatibility of luxury and sustainability, and others contradict it.

When it comes to considering a product as belonging to the diverse categories of luxury, product longevity and quality are seen as determining factors in the purchase decision process (Som & Blanckaert, 2021). For this reason, there are opposing perspectives that argue that ‘’luxury products by nature cannot be sustainable, as they are mostly considered unnecessary or non-essential purchases’’ (Kunz et al., 2020). On the other hand, there is also the position that appeals to indifference and skepticism when luxury brands refer to sustainability within the production and development processes of their products (“Sustainability and Luxury Fashion Products: Factors That Influence Purchase Decisions of Chinese Consumers,” 2017). Furthermore, there is a trend known as the phenomenon of sustainable luxury shopping, which is broadly based on a conscious preference for luxury timeless style and long-lasting quality over fast fashion and excessive volumes (Bendell & Kleanthous, 2007).

It is conceivable to understand luxury as a concept implicitly intertwined with sustainability if it is considered that they share common ideals such as quality, respect for natural and exotic resources, authenticity, timelessness, and attention and care for heritage (Hennings et al., 2015). Moreover, some studies argue and establish that the coherence between both concepts depends on the definition of luxury that is taken into consideration, additionally to the consumers to be reached. If consumers prioritize the traditional values and sensations of luxury brands, such as rarity and uniqueness over sustainability and traceability of the origin and production process of each product or service; sustainability becomes irrelevant for them, as they focus on the new values of luxury, meaning authenticity and exceptional quality (Brun & Karaosman, 2020). (Brun et al., 2017) established product longevity as the traditional pillar of luxury and the core of

sustainability, since this feature highly contributes to reducing the consumption of natural resources, the generation of waste and residues, and therefore drastically reducing contamination. Hence, sustainability could become a source of competitive advantage and an innovation initiative for luxury brands (Cervellon & Shammas, 2013). Luxury market analysts report that sustainability has risen to the forefront as the main focus and objective within the current market, presenting itself as the hope to recover and enhance the brand and product reputation (Kelleci, 2022).

In recent decades, the luxury market (mainly fashion) has been under strong pressure towards more sustainable and traceable internal and external logistics, manufacturing and distribution operations. Nevertheless, most companies attempting to implement sustainable practices throughout their value chain have been under criticism for their hesitancy in implementing them within the social and environmental responsibility scope (Carrigan et al., 2013).

In the manufacturing process of most luxury fashion products, high-quality, unique, and precious materials are decisive success factors (Som & Blanckaert, 2021). To maintain these elements, brands develop a dependency on suppliers, forcing them to secure, guarantee and preserve the future supply of natural resources and raw materials in the long term. However, it also leads to the search for innovation in the identification of new resources and raw materials. For this reason, it is worth highlighting two major challenges facing the luxury fashion industry in terms of sustainability and environmental care:

1. *‘‘To ensure and preserve natural resources used in production. Securing the supply of the raw materials that give a brand its competitive advantage is a key element in the success*

of luxury firms. Therefore, companies must embrace new practices to restore and regenerate ecosystems on which they depend; and

2. *Linked to this first challenge, luxury firms must identify new types of sustainable natural resources or create substitutes for current raw materials through production and design innovations.''* (Campos Franco et al., 2020)

Laboratory-grown materials: leather, fur, and diamonds

Currently, within the existing literature, there is a great void regarding a concrete definition of lab-grown materials and their general characteristics. Authors, journals, and magazines limit themselves to directly addressing leather, meat for human consumption, diamonds, and those materials based on plants and fungi. When defining this concept, it is vitally important to avoid confusing lab-grown materials with synthetic materials, which are created from different chemical and physical processes to change the composition of raw materials (Shackelford, 2003).

Lab-grown materials are as the name suggests, those which are created in laboratories from natural resources through practices that are committed to sustainability and environmental care (Modern Meadow, n.d.). They have been researched and developed to provide a replacement for various natural resources that have been overexploited for decades, causing social and environmental havoc. The key benefits of this type of product are: that they are essentially non-

distinguishable from their traditional predecessors and their creation does not harm the environment or human and animal life (Wenzel, 2007; Scipioni & Libassi, 2018).

Several companies, scientists, and experts have joined forces to develop various types of lab-grown materials to meet the needs of different industries and markets. This study will focus on the materials that are most used by the luxury industry: leather, fur, and diamonds.

A study conducted by (Keech et al., 2020), states that lab-grown products represent the response to consumer demand for more responsible luxury products through alternatives that do not sacrifice quality and attributes of luxury products such as rarity, authenticity, exceptional quality, and others. However, the study shows that consumers' perception of these types of products varies depending on their level of materialism. Consumers with a low level of materialism perceive these products as more valuable because it maintains or does not affect their social status. By contrast, those with a high level of materialism see their social status affected when making use of these products.

The study also reveals that lab-grown products may initially be seen as inferior in terms of prestige and value, but superior in terms of responsibility and ethics. Ultimately, an issue that has become the focus of research by younger consumers. Levels of materialism similarly relate to the ethics and responsibility that underlie the product. For consumers with lower levels of materialism, ethical product positioning is more effective than for those with higher levels of materialism (Keech et al., 2020).

Facing these consumer behavioral findings, the main challenge is to unveil how luxury companies and brands will manage to change consumers' perspectives in the long term. In other words, they must come up with marketing and communication strategies to eradicate the conception of lab-grown products as synonymous with low quality, authenticity, rarity, and exclusivity. Marketers must find out the most efficient way to position this type of product within the luxury segment (Keech et al., 2020). The goal is that in the future, lab-grown products will be considered superior in every way to their predecessors, mainly because of their sustainable and environmentally and socially friendly nature. Not only in the luxury industry but in all market segments.

As can be seen, there are conflicting opinions and arguments about lab-grown as a replacement for materials that are not sustainable. Especially in the luxury industry due to their nature related to quality, brand awareness, prestige, and excellence. The objective of the study is to unveil consumers' perceptions of lab-grown materials as substitutes for traditional raw materials in luxury goods production.

Lab-grown leather

Leather has always played an enormous role among the materials used in the luxury industry throughout history, due to the characteristics it possesses in terms of quality and durability. It has been used in all luxury sectors: automotive, furniture, sporting goods, and mainly fashion (Lau, 2022).

The production of this material has created a powerful global industry. However, in recent decades it has faced difficult times as the supply of leather has decreased, and people have stopped consuming meat. The decrease in demand is due to the growing concern on the part of consumers about the mistreatment to which animals are subjected to obtain their meat (Hepburn, 2015). However, the concern about this problem goes beyond the food industry. The leather industry, especially focused on fashion, has been strongly criticized by consumers, environmentalists, and activists due to the great negative impact it generates against the environment and the animals that are daily mistreated and slaughtered to obtain this raw material (Murray, 2015; Hepburn, 2015).

In terms of the environment, leather production is responsible for generating pollution and damage to natural resources caused by water waste, and chemical waste generated by the trimming, fleshing, and shaving processes - known collectively as tanning, which contributes between 70% to 90% to pollution by ways of energy consumption, abiotic resource depletion potential, photochemical oxidant creation potential (POCP), and fresh aquatic ecotoxicity potential (Lau, 2022).

In response to this growing problem, several vegan alternatives have emerged, such as synthetic leather (Lau, 2022). However, in terms of sustainability they continue to be polluting, inorganic, and a major contributor to pollution. Additionally, as they are used in the fashion industry, specifically in the luxury sector, these materials are not substitutes for farm-grown

leather as they do not meet the exact characteristics of design, quality, durability, strength, and resistance expected by both consumers and luxury brands.

The main challenge arises from the need to find a substitute for farm-grown leather that can meet the same quality and design characteristics demanded by the luxury fashion industry. Designers and brands have often been skeptical about the advent of this alternative. However, in recent years different initiatives have been emerging to meet this need, which in the future will be a radical change and highly contribute to the sustainability and CSR of luxury brands and the fashion industry in general.

Different initiatives are betting on reducing waste, environmental damage, and animal abuse through proposals of leather made from biotechnology, science, innovation, and research. Lab-grown leather can be obtained through different methods (Zulian, 2020). Some companies are working on growing animal stem cells in laboratories to produce animal hides. These cells are obtained by harvesting skin cells from live animals and then transported to bioreactors and specialized technologies that provide the necessary conditions for them to replicate and produce leather. This process takes approximately two weeks, which significantly reduces the time required to produce farm-grown leather, which can take years if we take into account the time the animals are raised for their growth. It is possible to obtain billions of square meters of leather from a biopsy of a single animal (Gandhi, 2021; Zulian, 2020).

On the other hand, other business initiatives opt for the use of terrestrial and marine microorganisms such as fungus strains fed with plant and protein materials to produce bio-

fabricated materials that assimilate the textures of leather. This method greatly simplifies the tanning process, which is largely responsible for chemical environmental damage, and water and electricity consumption (Zulian, 2020).

Modern Meadow is one of the companies that has dedicated itself to the research and development of lab-grown leather. The name given to this leather is Zoa. The company offers a proposal of a material that looks and feels like leather but comes from the union of science, engineering, and animal-free collagen to give different textures to the material to give products and designers new opportunities for innovation. It is essential to keep in mind that this leather is not intended to serve as an imitation of leather, but as an improved version of it. Brands can stop thinking about the value of leather in terms of price per square meter because with lab-grown leather, design and supply chain processes are optimized. In addition, color, texture, and thickness specifications for each piece can be pre-determined in the lab at the brands' request (Modern Meadow, n.d.).

In addition to Modern Meadow, there are other lab-grown proposals such as VitroLabs. These companies are committed to becoming leather suppliers for major brands in different business sectors. Later, the case of a luxury company that is in the process of implementing lab-grown leather within its production chain will be presented, deepening this practice applied within the luxury industry.

Lab-grown fur

Concerning the fur used in the fashion industry, today several synthetic alternatives are still pollutants, but significantly reduce the use of real fur and therefore contribute to mitigating collateral problems such as illegal trafficking of animals and exotic skins, the advance of the extinction of different species, and animal cruelty (Faux Fur Institute, 2018). Nonetheless, synthetic fur does not represent a viable alternative for the luxury industry since its characteristics as a product are completely different from the expectations of both the brand and the consumer. Additionally, natural fur is a material that reinforces the industry's qualities of rarity, exclusivity, quality, hedonistic feelings, elegance, scarcity, authenticity, and timelessness (Keech et al., 2020).

Furoid is one of the many companies in the search and development of alternatives that provide the same characteristics, respecting the environment and animals. They have been pioneers in the creation of in vitro hair follicles linked to collagen, through the cultivation of stem cells from different animals under the necessary and adequate conditions for them to grow and become real tissue. This process is known as "bio-print" fur without the need for animal abuse. As for environmental respect, the company is involved in the tanning and dyeing process within the development at the cellular level, which limits and eradicates the use of polluting chemicals and their subsequent environmental disposal (Varanasi, n.d.; Faux Fur Institute, 2018).

On the other hand, it is also possible to find alternatives developed thanks to the use of the main protein found in animal hair: keratin. In collaboration with biotechnology, it is possible to create realistic plant-based versions of animal fur. DNA sequences are used to instruct the cells to produce keratin and sequences are added to the yeast cells (Phillips & Byrne, 2022). Within this process, it is worth noting that the manufacturing companies include inseparable cellular/DNA-based anti-counterfeit properties to the final product to contribute to the determination of the provenance and origin of the product (Faux Fur Institute, 2018). For luxury brands, this represents brand protection, but at the same time contributes to traceability to fight the illegal fur trade (Phillips & Byrne, 2022).

One of the main advantages of this method is that cells can be collected from the vertebrae of many animal species. For example, among the most used in the luxury industry are caiman, cheetah, chinchilla, crocodile, cow, fox, golden jackal, leopard, caracal, genet, lynx, and snake, among others. The cells obtained are vertebral cells from animals in good health conditions, which are not exposed to any chemical process or mistreatment. However, although this project promises to change and innovation, many luxury brands have shown resistance to change (Faux Fur Institute, 2018).

Companies developing this technology face the challenge of raising funds to cover research and development costs. Luxury brands tend to have unrealistic expectations about how they will be able to develop their products. They are looking for fast and effective results without the need for experimentation and studies to produce on a large scale. Likewise, capitalists and investors take too much time in the decision-making process and additionally ask for very high

percentages. The only light that these companies see are the organizations dedicated to fighting for animal welfare, the problem lies in this case, in that those organizations although they are committed and have the intention to contribute to the project, do not have money to fund themselves, so it is idealistic to be able to fund the development of bio-fabricated leather (Phillips & Byrne, 2022).

The case of one of the luxury brands that has decided to implement this new practice within its value chain and that additionally has committed to contribute to the development of this project to deepen this practice applied within the luxury industry will be presented later.

Lab-grown diamonds

In previous cases, reference has been made to materials used in the luxury fashion industry. However, it is inevitable to forget the rest of the sectors that constitute it. Luxury jewelry is considered the greatest expression of it, taking into account that it can have different facets and categorizations. It is possible to find products that belong to everyday luxury, others to aspirational luxury, to the premium or ultra-premium range, and finally, those that belong to absolute luxury (Mihailovich, 2020). Jewelry falls into this last category due to its characteristics linked to exclusivity, heritage, the rarity of the stones and metals with which the pieces are made, the savoir-faire, and craftsmanship (Mihailovich, 2020). The conception and elaboration of each piece of jewelry represent an art, especially when it is a piece composed of unique and exceptionally rare precious stones such as diamonds.

The extraction of these stones is mainly carried out in countries such as Angola, Australia, Botswana, Canada, the Democratic Republic of Congo, Russia, South Africa, and Sierra Leone. It is a process that generates a high social, economic and environmental impact (Mas Joyeria, n.d.). The greatest impact is evidenced in the environment because it threatens natural resources, ecosystems, and the ozone layer. Extracting a 1.0-carat rough diamond requires the removal of approximately 1,750 tons of earth and requires approximately 126 gallons of water. This process is highly energy intensive and the emissions it generates are composed of diesel, oil, and gasoline. Its waste includes materials such as plastic, oil, paper, batteries, and glass (Frost Sullivan, 2014). Together this becomes a major problem that affects the surrounding ecosystems and communities generating deforestation and the displacement of flora, fauna, and even people and diseases to humans and animals in the areas surrounding the mines due to air and water pollution. On the other hand, there are also other related social problems such as forced displacement, labor exploitation, illegal mining, unemployment, and child labor (Human Rights Watch, 2009).

In the last decades, the concern for corporate responsibility towards climate change and environmental preservation has been increasing in all sectors. Within the jewelry industry, different companies have presented innovative scientific initiatives to face the various problems generated by diamond mining and thus can turn it into a sustainable industry. These are lab-grown diamonds, an alternative in which mining is not necessary and at the same time provides the same physical, chemical, and visual results as a mined diamond. The growth of these stones takes place in highly controlled laboratory environments, in which through different

technological processes it is possible to duplicate and recreate exactly the conditions under which natural diamonds develop on the earth, mainly the extreme pressure and temperature to which they are exposed (Hemley et al., 2005). This type of diamond is created thanks to carbon atoms that are present in the structural composition of the diamond crystal, which gives them the same chemical and optical properties as a natural diamond (Deljanin & Simic, 2020).

The advantages of this alternative are significant and highly promising for the industry. Visually, it is possible to obtain different color ranges that are present in natural diamonds and which are considered to be highly rare, such as yellow diamonds. The only way to differentiate a natural diamond from a lab-grown diamond is using specialized equipment that can detect the slightest differences in the elements and crystal growth inside the diamond. At first glance, it is impossible to identify the differences. However, it should be noted that this type of diamond should not be confused with those that simulate diamonds, such as cubic zirconia and moissanite, which, although they look similar, do not have the true characteristics (Deljanin, 2014). Laboratory-grown diamonds that are available for purchase carry with them a certificate of identification as laboratory grown. The process of grading this type of diamond is identical to the process with natural diamonds. It focuses on the cut, carat, clarity, and color of the stone (YADAV Diamonds and Jewelry, 2022).

In the luxury industry, several retailers have already begun to test the market potential of lab-grown diamonds (DeMarco, 2019). Although lab-grown diamonds are now approaching, a decade or so of being on the market, it is only a few years ago that they started to become more available to consumers. However, the question arises at the moment of implementing them in the

luxury industry, in which the perception of consumers related to the prestige and rarity that natural diamonds grant is questioned. A case study of a luxury brand that is implementing this innovation strategy within its value chain will be presented below.

Case Studies

LVMH lab-grown fur

The most important conglomerate in the luxury industry, together with Imperial College London and the Central Saint Martins University of Arts, joined forces to develop an alternative free of cruelty and animal abuse to replace the use of exotic animal hair in the manufacture of luxury products and goods (Phillips & Byrne, 2022). The main objective is that these alternative grants the same characteristics of natural fur in terms of quality, texture, durability, and versatility. It is animal fur grown in laboratories that have the necessary biotechnology to grow animal hair tissue from hair cells from healthy animals. The cultivation of these cells is done through biotechnological processes that offer the same environmental, physical, and chemical conditions for the development of natural hair tissue. The research is being led by Fendi, considering that the brand has always been internationally recognized for its constant use of animal hair that is on the verge of extinction (Cernansky & Webb, 2022).

The objective is not to create a new trend in the manufacture of products but to generate a radical change that manages to set the guidelines for various brands to adopt these materials as a replacement for the natural raw material, since some of them like Stella McCartney, Oscar de la Renta, and Burberry, have opted for synthetic fur alternatives that, although free of animal

cruelty, are still polluting substitutes due to their plastic and petroleum components (Cernansky & Webb, 2022). And additionally, offer an alternative for those who simply decided to eradicate animal fur within their collections as Dolce and Gabbana, Gucci and Armani have done (Halliday, 2022).

On the other hand, the conglomerate also has the long-term goal of implementing a sustainable circular strategy. Cells need specific proteins such as keratin to be cultivated. LVMH's challenge is to use the waste generated by its wine and spirits industry (Moêt, Hennessy, Dom Perignon, etc. ....) to obtain the proteins necessary for the growth of hair cells. So far it is a project that is in the development and research stage (Cernansky & Webb, 2022). The real challenge will come when thinking about large-scale production for luxury brands because they will have to reinvent all their manufacturing techniques and know-how to make way for the era of biomanufacturing.

Kering lab-grown leather

Kering announced a few years ago the withdrawal of animal hair as a raw material in all its brands. However, the brands belonging to this conglomerate continue to use animal leather for the manufacture of their products.

In the luxury industry, in addition to bovine leather, it is possible to find products made from the leather of exotic animals such as ostrich, crocodile, and snake, among others. In addition to mistreating and slaughtering different types of species, the leather industry also

causes different negative effects on the environment due to the chemical waste generated by the processing of the leather to be used and additionally the processes related to the dyeing of the leather (Varanasi, n.d.). In the case of leather, it is much more complex and significant to simply decide to stop using it in manufacturing due to its popularity and recognition for its durability and quality. The substitute materials that have emerged fail to fully replace the characteristics of natural leather and continue to be highly environmentally harmful (Murray, 2015).

Vitrolabs is an American company that has been able to make the most of this problem. Its main objective is not to create a sustainable alternative to natural leather. Their mission is to create natural leather in a sustainable, responsible way, committed to the balance between humans and nature. Through biotechnology, they have developed and researched a process that allows them to create natural leather without the need to mistreat animals. From a single biopsy, they collect a cell to cultivate it and allow it to regenerate and reproduce itself by providing it with the necessary conditions and environment. The cell is grown in a bioreactor that provides it with the proper signals and nutrients it needs to become a culture. Once the growth phase is finished, the culture goes directly to the dyeing process, which is much more simplified and reduces the environmental impact. Thanks to this process it is possible to grow billions of square meters of leather from a single biopsy of a single animal (Vitrolabs Inc, 2022). It should be noted that the biopsy is performed on healthy animals and does not represent any type of suffering for the animal.

In May 2022, Kering announced that it would collaborate with this company to drive the development of this initiative. However, since 2018 they have been working confidentially on product development and dyeing processes. This year, the owner of Gucci decided to invest in the Vitrolabs fundraiser, in which different macro-companies and personalities such as Leonardo

DiCaprio participated (Pauly, 2022). The goal is to build and scale up the first production of lab-grown leather and accelerate the commercialization of the products (Tondo, 2021). The first products made from this type of leather are expected to be launched in 2023 (Kent, 2022).

Tag Heuer (LVMH) lab-grown diamonds

At first, lab-grown diamonds had a negative reputation and image, as they lost all value, rarity and preciousness due to their provenance. Normally these diamonds were associated with cheapness and ordinariness. However, LVMH decided to put an end to this image and took the initiative to invest in Lusix, an Israeli company that has positioned itself as a pioneer in the laboratory diamond industry (Danziger, 2022). This step marks the beginning of a new era for these diamonds as it has opened up the possibilities of working with them in the luxury industry.

In recent years, the demand for lab-grown diamonds has been skyrocketing, and the only thing stopping this growth is supply. LVMH's investment gives it secure access to a premium supply. Thanks to the amount of money raised, Lusix will be able to double its production by 2023. However, LVMH struck the biggest blow before all its competitors. Earlier this year, Tag Heuer's CEO presented the first watch containing laboratory diamonds for USD 360,000 (Danziger, 2022).

The cultivation process is based on principles similar to those of animal hair and skin: crystalline cells are taken and placed inside vacuum chambers where plasma and different types of gasses are injected to allow the growth of natural crystals. It should be noted that inside these

chambers the diamonds have the same conditions in which they grow naturally underground. After the growth stage is finished, the diamond is cut and polished with a laser (Tag Heuer, 2022). The best thing about this alternative is that the result is flawless. At first sight, it is impossible to differentiate a natural diamond from a laboratory diamond, the only way to do it is with specialized technology and equipment. The characteristics in terms of quality and durability are the same (Tag Heuer, 2022). Likewise, this type of laboratory-grown material provides a sustainable solution that leaves aside the immense environmental damage caused by diamond mining, in addition to the collateral damage it causes to the populations living near the mines and their workers.

Consumer perception towards sustainability

During the last few years, creating a fusion between luxury and sustainability has proved to be attractive to consumers of the industry. New generations are increasingly interested in luxury brands that implement sustainable strategies in their value chain and their brand values (Campos Franco et al., 2020). Existing literature concerning consumer behavior has shown that the acceptance and awareness of sustainable products vary depending on several factors. Among them, one of the main ones is their characteristics and cultural origin (Doran, 2009).

In addition, it is worth mentioning the perceived quality of products within these factors. This is defined as "the consumers' judgment of the excellence or general superiority of a product" (Zeithaml, 1998). Other authors such as (Dubois et al., 2001) have established that quality and

luxury can become almost synonymous in the minds of many consumers. However, by incorporating sustainable attributes within luxury products, there is a risk of affecting perceived quality. Especially when sustainability comes to impacting key factors in establishing the quality level of the product, such as, in this case, the materials used in fabrication processes (Dekhili et al., 2019).

Quality is one of the key factors of success in the luxury industry, as well as being the main motivation in the decision process of consumption of products and services within this market segment (Dubois et al., 2001). Therefore, brands must respond consistently to consumers' increased awareness of the quality and rarity of the products and services they offer (Kim & Ko, 2012). In the case of younger consumers, the significance of the purchasing decision-making process lies in social and environmental issues. For them, sustainability has become an indispensable benchmark for assessing the brands' success. Turning this aspect into one of the main targets to approach the marketing and branding of the industry's companies (Phau et al., 2015).

Additionally, a key consideration is that consumers, when using luxury products or services, are seeking the feeling of being different and special being at the forefront of current trends and feeling that they belong to society and their current environment. Regarding this tendance of consumer behavior (Mazzalovo & Chevalier, 2020) established four essential dimensions that consumers consider essential to be able to classify a brand within the luxury industry:

1. Elitism, i.e., the creation of a feeling of belonging to a specific group, which plays a role as an indicator of social success.
2. Product quality spread throughout the value chain and high product prices.

3. Personal emotion and affective elements. i.e. hedonism. The generation of pleasure, emotions, and dream-like sensations.
4. Brand power. It means reputation and uniqueness.

Besides, other factors lead to the purchase decision. These are hedonism, the reflection of self or personality, to convey status or wealth, perceived excellent quality of luxury fashion items, rarity or uniqueness, and price (Mazzalovo & Chevalier, 2020). Similarly, the five dimensions of the ECO scale are proposed concerning environmental responsibility influencing consumers' purchasing decisions (Stone et al., 1995):

1. Knowledge and awareness.
2. Desire and willingness to act.
3. Ability to act.
4. Opinions and attitudes towards the environment.
5. Consumption behavior towards the environment.

Nonetheless, not all consumers are willing to sacrifice the functional attributes of products and services to privilege those linked to ethical and responsible consumption (Achabou et al., 2020). It could be possible that they are not willing to implement and adopt sustainable consumption practices that respect the environment and social issues, because they feel physically and culturally distanced from them (Carrigan et al., 2013).

The existing literature has shown that animal welfare, for example, has very little relevance for consumers when they are faced with the purchase decision process for all types of luxury products. They tend to associate, for instance, with the quality of products made with animal

fibers, instead of thinking about the health of those animals that are exploited to obtain those raw materials. This is referred to as selfish consumption, because aspects such as personal and financial needs, such as social recognition and self-esteem, come to play a greater role in the process. On the contrary, however, consumers tend to give importance to other social responsibility issues such as child exploitation, labor abuse, the salary gap, and the minimum wage (Hustvedt & Bernard, 2018).

(Reimers et al., 2016) identified four factors that influence consumer perceptions of ethical clothing: environmental responsibility, employee welfare, animal welfare, and slow fashion attributes, and confirmed that animal welfare exerts the greatest influence.

3. Methodology

Objective of the research model

Considering the growing consumer concern for sustainability and social responsibility in the last decades, many companies and business groups have started to plan and implement different strategies in their value chain to meet the demand of being responsible organizations for their operations and the way they affect the environment in general.

In the different business and industrial sectors, there are different types of strategies focused on reducing environmental, social, and economic impact. For some sectors it has been a simpler and easier process than for others, depending on the characteristics and conditions of

each one. For the luxury industry, in the beginning, the scenario was complex and not very promising due to the nature of the sector. However, when it became evident that sustainability and social responsibility not only encompass the business world but also transcend the political, social, and economic spheres internationally, luxury brands saw the need to begin to propose sustainable and responsible strategies within their value chain.

Lab-grown materials are one of the strategies they have begun to implement. Different brands and conglomerates have taken great strides to move towards this innovative approach that looks promising for the future of sustainable luxury. This study focuses on the consumers' perception of the implementation of these strategies by luxury brands. The main objective is to discover how the substitution of different raw materials for lab-grown materials could affect consumers' perception of luxury goods and brands.

There are limited studies focused on lab-grown materials and their dynamics among the different business sectors. Particularly in the luxury industry, a void of great importance for future research can be found. This gap could be useful for marketers, consumers, and the sustainable market in general. This study aims to present itself as a starting point for future research related to luxury marketing strategies and the use of lab-grown products within it.

Data collection

The approach selected to answer the main research question: "Laboratory-grown biomaterials as a substitute for unsustainable raw materials in the production of luxury goods: how does it affect consumer perception?" is qualitative research, considering that this type of

research focuses on revealing in a theoretical way the impact of a specific context on behaviors since its nature allows to obtain greater sensitivity to them to obtain situational inferences as a result (Jhons, 2006).

As a qualitative methodology for data collection, a structured interview was proposed, which had to be answered in a specific order that will be explained in detail below. Among the qualitative data collection methods, the interview was selected because it provides natural and spontaneous answers from the interviewees (Patton, 2002). The interview focuses on two question formats recommended by (Patton, 2002) in which both general and detailed open-ended questions are combined. Below follows a brief explanation of the general structure of the interview:

Question's purpose:

Initially, questions were asked to ascertain the gender, age, and nationality of the interviewee. Subsequently, since the general topic of the research may be unfamiliar to most of the sample, four basic concepts were presented to provide the appropriate context for the questions to be answered. They were the following concepts: Lab-grown products, lab-grown fur, lab-grown leather, lab-grown diamonds, and lab-grown fur (Appendix). In each of them, the raw materials they would be replacing were presented, some data on the negative environmental and social impact they have, and finally, each lab-grown product was presented as a solution to the problems caused by natural raw materials, adding a brief description of the laboratory cultivation process of each of them. After introducing these concepts, the first section of questions was presented:

1. What do you think about the implementation of sustainable strategies by luxury brands?

- Question purpose: to find out in general terms the perception that the interviewee has about the overall topic from which the research is derived just after having learned about laboratory-grown materials.

2. Before participating in this interview, were you familiar with or had you heard of lab-grown materials or any of the alternatives presented above? If so, which one? If not, which of these caught your attention and why?

- Question purpose: to discover the theoretical or experimental background that the interviewee has had before the interview as a tool for subsequent analysis.

Now, I am going to mention two topics, please tell me without reflecting hard, the first three words that come to your mind when you hear each one of them.

3. Luxury industry
4. Sustainable luxury

- Question purpose: this exercise intends to unveil the immediate associations that interviewees have towards this concept immediately after the concepts have been presented to them.

5. How often do you buy products that you consider luxury? Do you normally shop online or in-store? If you are not a regular luxury shopper, please imagine this is your first luxury purchase.

- Question purpose: first of all, the aim is to know whether the interviewee is a regular luxury buyer or not, as this can help to determine the knowledge and experience that he/she has as a luxury consumer. Additionally, it is interesting to know the perspective of

a respondent who has not consumed luxury, but who is asked to imagine what his first purchase would be like since in a superficial way it is possible to unveil the aspirational factor that typifies the luxury industry.

6. Excluding the money and price factor, do you consider that you would change your consumption habits of luxury products if brands implemented lab-grown materials in the manufacturing of their products as a replacement for natural raw materials?

- Question purpose: it is requested to exclude the money and price factor since the study does not consider the purchasing power of the interviewees. The main interest is to find out perceptions related to feelings, environmental awareness, and hedonism; factors that can be distorted when the economic value of the product comes into play. Therefore, the objective of the question is to know broadly if the interviewees would be willing to change their habits having received little prior information about lab-grown products.

7. Do you consider that the use of LGPs has any effect on your perception of luxury products in terms of quality, exclusivity, or design?

- Question purpose: The question is posed broadly to get a general picture of respondents' perceptions when they have been exposed to little information and before being exposed to the more specific and extensive information about the implementation of LPG in luxury brands.

8. Briefly describe your motivations for buying luxury products.

- Question's purpose: By asking about their motivations, we intend to discover the determining factors for their purchase decision, whether utilitarian or hedonistic motives, to later be analyzed concerning the theory proposed on consumer behavior.

For the second section of the interview, questions are paused, and we proceed to have an informative talk in which the interviewer presents the interviewee with three cases of different luxury companies or conglomerates that are in the progress of implementing lab-grown materials within their value chain. Before presenting each case, the interviewee is introduced to the most important conglomerates in the industry: LVMH and Kering, simply mentioning that they are the most representative, the number of houses they own, and the best-known ones are mentioned. Based on this information, three different cases are presented. Two of these cases are presented in a general way without specifying any brand but as the work of each conglomerate. In the case of LVMH, the research initiative that is in process for the development of lab-grown fur is presented. In the case of Kering, the progress it is making by investing in the research and development of lab-grown leather is presented, and finally, LVMH is presented again, in this case talking specifically about Tag Heuer and the launch of a watch designed with lab-grown diamonds. (Appendix 1).

Case presentation purpose: in the first section of the interview a general introduction to the topic was given without mentioning real examples and cases of the implementation of the materials. The subsequent questions are based solely on this information. However, the purpose of presenting these cases is to show whether the perspectives change or remain the same now that the interviewees can have a real and tangible vision of LGP (Lab Grown Products) implementation by conglomerates and luxury brands of international reference. Although the case of lab-grown leather and fur does not yet present a final product, it demonstrates that luxury brands are striving to present sustainable strategies. However, the case of Tag Heuer is left for

the end to close the presentation of the cases with a final product that is on the market, for the interviewees to be aware that the implementation of LGP is happening in the industry.

Additionally, four images are shown throughout the explanation. The first is a photo of the sample presented by Vitro Labs of the lab-grown leather, the second, third and fourth are images of the Tag Heuer watch where the diamonds can be seen. (Appendix). This is so that interviewees can have a visual experience that supports and enhances the credibility of the implementation of these strategies by luxury brands. After the presentation of the three cases, we proceed to continue with the questions.

9. From the previously exposed cases, which one called your attention the most and why?

- Question purpose: to discover which of the three alternatives is the one that most attracts the attention of the interviewees to see if the reasons can be taken as useful tools to propose new aspects for marketing strategies. Also, to know which aspects they find relevant or fundamental to decide between the alternatives.

10. Among the brands mentioned above, which one would you be interested in buying LGP? why?

- Question purpose: to know which brand or conglomerate respondents prefer or have more credibility when it comes to present innovations or strategies in the luxury market.

11. Imagine that you purchased some LGP from one of these brands, would you appreciate that at a glance the product has some specific way of recognition that shows that it is a sustainable product made from lab-grown materials? Whether in the product design, logo, or any other way?

- Purpose of the question: to find out the respondents' preferences to outline aspects of marketing, communication, and design if any of the brands are interested in launching their LGP.

12. If any of the luxury brands were to launch a collection or an LGP, would you like them to continue with their traditional marketing or would you prefer them to be innovative in their marketing and communication strategies, in order to highlight the sustainable approach?

- Question purpose: this question is a very broad one, but it allows us to outline in a general way whether respondents prefer traditional marketing strategies or whether companies should create a whole new strategy that raises awareness about the sustainability of the raw materials of their products.

Now, I am going to mention two topics, please tell me without reflecting hard, the first three words that come to your mind when you hear each one of them.

13. Lab-grown products
14. Sustainable luxury

- Purpose of the question: in question 13 we want to know the immediate associations that the interviewees created after knowing and hearing about LGPs. Item 14 is repeated (question 4 in the first section), the intention is to evidence if the immediate associations of the concept changed concerning the answers before the interviewees knew each case applied in the most recognized luxury brands. Interviewees see the future of LGPs and what expectations they have of them within the industry.

15. Finally, briefly describe your opinion on LGPs, how do you see the long-term outlook for LGPs in the luxury industry?

- Question purpose: a broad closing question to find out in general terms how the interviewees see the future of LGPs and what expectations they have of them within the industry.

Data Analysis and Results

The interview was conducted with 15 people of different nationalities, both men and women in an age range of 20 to 35 years. There were no specific conditions necessary to be part of the interviewees. The sample was random, obtained through the "snowball sampling" method (Patton, 2002), whereby the voluntary participation of each person was obtained through the voice-to-voice and social networks of both the researcher and some interviewees. By choice of the majority of interviewees, the interviews were anonymous. All interviews were conducted online through platforms such as Teams and Zoom, with an approximate duration of 30 to 45 minutes.

Once all the interviews were conducted, all the responses were transcribed and grouped for each question for subsequent analysis (Appendix). Although this study is qualitative by nature, some graphs with quantitative values will be presented below to illustrate the results in percentages for each response.

Data categorization

An analysis model was created from the existing literature to interpret the interviewees' responses grouped by question. To achieve an applicable categorization for the overall questions, two evaluation methods were created emerging from proposals in the existing literature. The primary method is based on a chart proposed by (Mazzalovo & Chevalier, 2020) in which the definitions of luxury given by consumers are positioned (Appendix).

Model A: This diagram was modified to be applicable to the main objective of the study. The approach of the chart proposed by (Mazzalovo & Chevalier, 2020) is the luxury conceptualization. In the case of the present study, the diagram focuses on classifying the perception that the interviewees (consumers) have in a general sense about lab-grown materials and the implementation of sustainability within the value chain of luxury brands.

In the first instance, the structure of the table was raised from two main approaches: the perception of LGMs (Lab-grown materials) and sustainability associated with the reflection of its self-image (Keech et al., 2020; Doran, 2009; Hennings et al., 2015) and the perception related to external factors, i.e., the associations that the consumer makes towards the luxury industry as a whole (Dubois et al., 2001). Within each approach, two different categories were suggested.

Concerning the perception of the luxury industry, two classifications are found: associations related to luxury brands and those directly related to the product. In the case of self-image perception: consumer associations are related to their self-image concerning a collective (either a specific group of people or society), and associations linked to their self-image to the

consumer himself. It should be noted that within the category of social self-image, in some cases keywords related to sustainability are included, taking into account that when obtaining associations related to this topic the consumer is thinking about the collective welfare, i.e. of the living beings that surround him; in this case, nature, society, and animals. Additionally, within the different categories, factors that determine consumer perception were classified according to existing literature studies and authors. Most of the factors are product-related, taking into account that the study is focused on unveiling the consumers' perception toward the implementation of lab-grown materials in the manufacture of luxury products (Appendix).

Model B: At the same time, it is also taken as a reference, the model proposed by (Mazzalovo & Chevalier, 2020) which evaluates the importance attached by consumers to sustainability and their tendency to present consumption behaviors that tend either to individualism (selfishness) or collectivism (Appendix 2). The aim is to classify consumers into four types of consumers:

- Moderate consumer attempts to follow trends, therefore it presents a slight interest in sustainability because he knows it is an issue that is gaining importance for certain parts of the population that surrounds him.
- Smart consumers try to follow consumption trends that are beneficial both for them and for the broader population. He is curious about sustainability.
- Dedicated consumer is a sustainability fan and tries to implement it throughout all aspects of his lifestyle. He knows that it provides personal benefits, and above all, it generates major positive impacts collectively.
- Ego consumers are not interested in sustainability at all. His/her consumption tendencies are conservative and focused on the cost-benefit ratio.

When analyzing each question, if possible, the overall response pattern will be classified in a general way to the type of consumer it belongs to, according to the associations obtained for each topic.

Demographic sampling

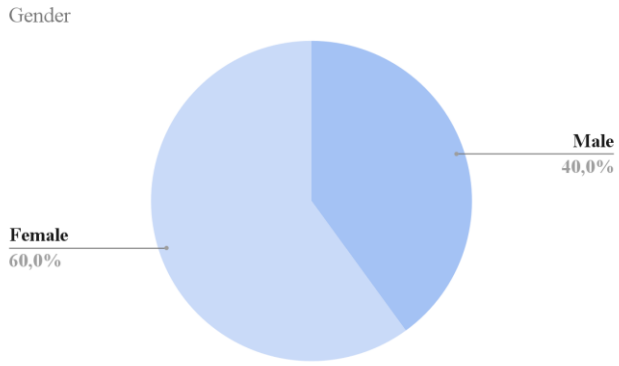

Figure 1. Gender. Source: Author's own work.

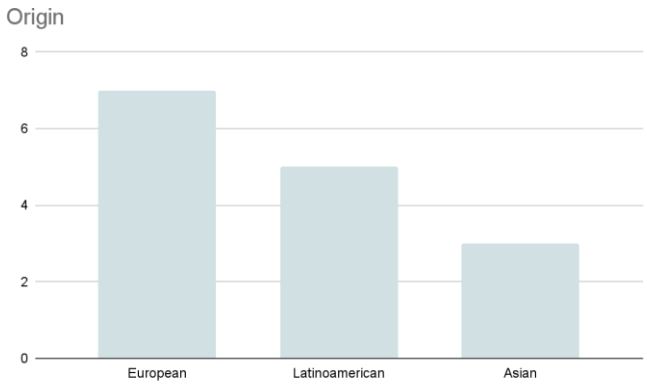

Figure 2. Origin of the interviewees. Source: Author's own work.

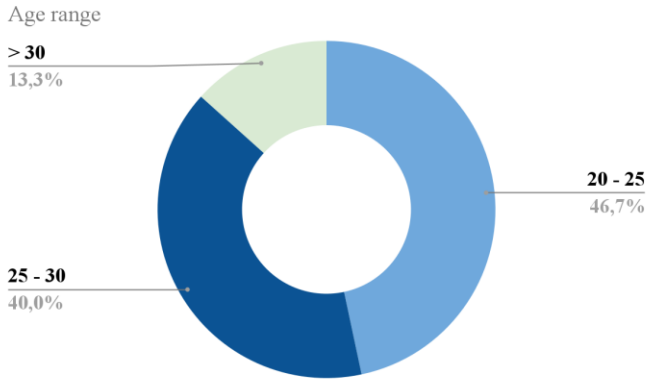

Figure 3. Age range. Source: Author's own work.

The results presented below come from interviews conducted with 15 people, of which 60% are women and 40% are men. 46% percent of the interviewees are of European origin, 33% are Latin American and 20% are Asian. The age range of the interviewees varies between 20 and 35 years. 46% of them are between 20 and 25 years old, 40% are between 25 and 30 years old, and 13% are over 30 years old.

Results analysis

Afterward, answers to each question will be analyzed as a whole through the qualitative analytical method proposed by (Packer, 2018) in which the researcher looks for connective threads and patterns among the interview excerpts, and connections among the various categories that might be called topics, to obtain the direct associations (keywords) that the interviewers make with the topic of each question, and then relate them to the analytical models explained above.

Question 1: What do you think about the implementation of sustainable strategies by luxury brands?

- *Overview of the general perception of the implementation of sustainable strategies within the value chain of luxury brands.*

100% of the interviewees expressed a positive position regarding the implementation of sustainable strategies by luxury brands after having heard about the concepts of laboratory-grown material. Three main orientations can be identified within their responses. Below is a graph showing the three orientations and the keywords associated with them, which were mentioned by the interviewees.

Business and brand-oriented perception	Environmental and social-oriented perception	Consumer-oriented perception
- Companies - Production - Resources - Global economy - Supply chain - Industry - Brand value - Textile industry - Fashion industry	- Social benefit - Planet - Environment - Impact - Pollution - Natural resources - Ecosystems - Mining - Deforestation - Animals - Circular economy - Social responsibility - Mitigation - Damage - Irreparable	- Appeal - Popular - Awareness - Consumer habits - Influence

Figure 4. Orientations and associations Q1. Source: Author's own work.

Adjectives attributed to the implementation of sustainable strategies in the luxury industry:

Interesting, positive, important, successful, viable, great, essential, positive, valuable, committed, appealing, good, amazing.

Model A:

Focused on Luxury Industry	Focused on Self-image
Brand - Companies - Global Economy - Supply chain - Industry - Brand value - Textile industry - Fashion industry	**Social** - Social benefit - Planet - Environment - Impact - Pollution - Natural resources - Ecosystems - Mining - Deforestation - Animals - Circular economy - Social responsibility - Mitigation - Damage - Irreparable
Product - Production - Resources	**Personal** - Popular - Influence - Appeal - Awareness

Figure 5. Model A Q1. Source: Author's own work.

Model B:

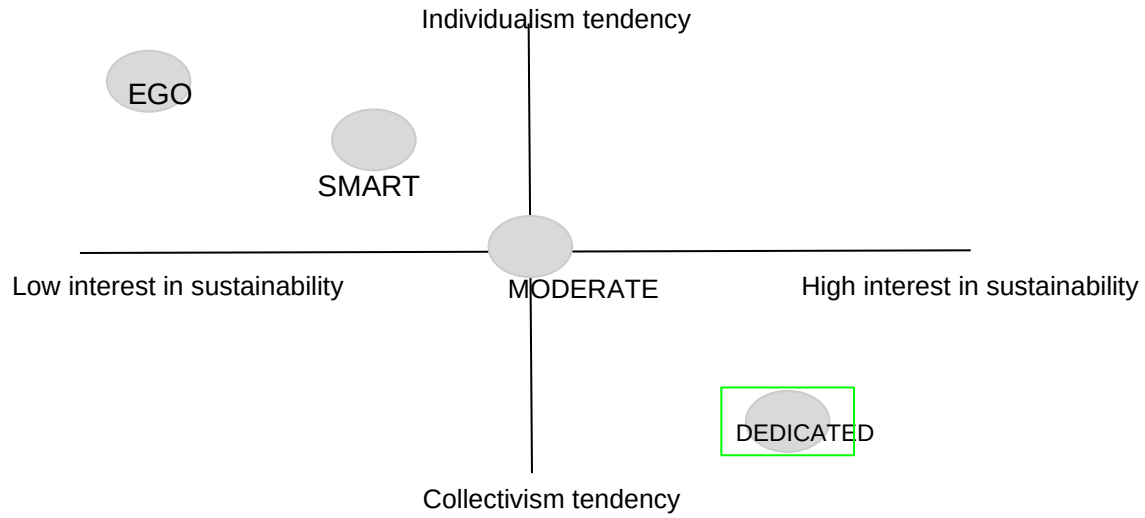

Figure 6. Model B Q1. Source: Author's own work.

Question 2: Before participating in this interview, were you familiar with or had you heard of lab-grown materials or any of the alternatives presented above? If so, which one? If not, which of these caught your attention and why?

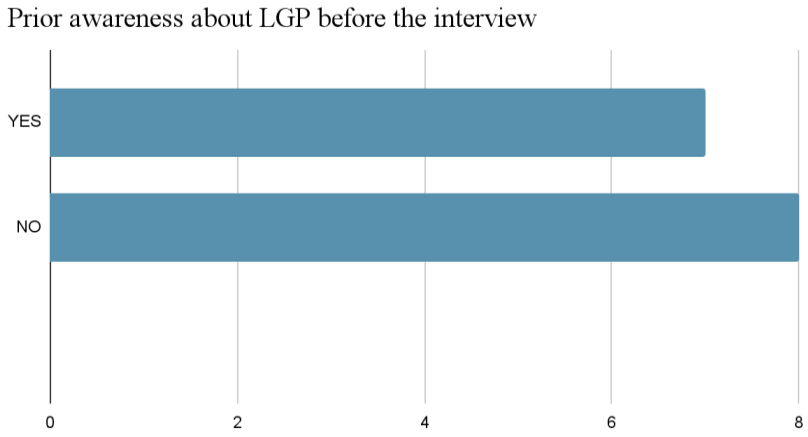

Figure 7. Prior awareness about LPG before the interview. Source: Author's own work.

53% of the interviewees had no pre-interview knowledge of lab-grown materials. 47% of the interviewees had prior knowledge of lab-grown products. Within this percentage, 42.9% of the

interviewees had prior knowledge about lab-grown diamonds, 42.9% about lab-grown fur, and 14.3% about lab-grown leather.

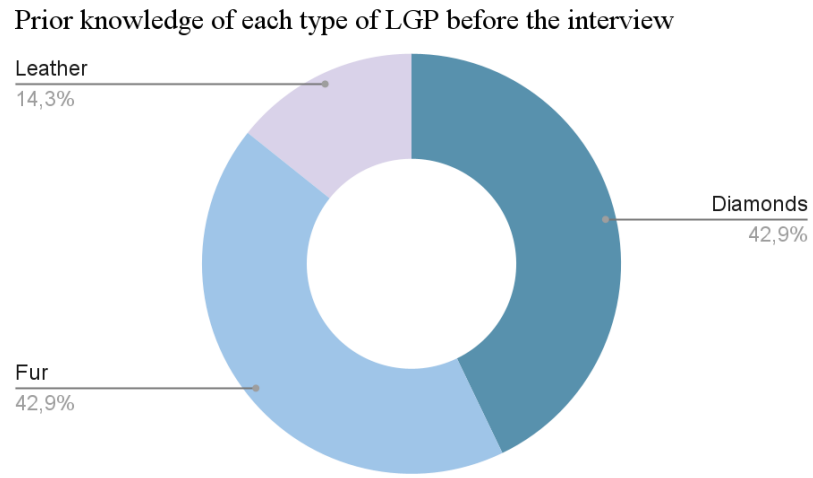

Figure 8. Prior knowledge of each type of LGP before the interview. Source: Author's own work.

After being informed at the beginning of the interview about LGMs, 60% of the interviewees were most interested in lab-grown diamonds, and 26.7% were interested in lab-grown fur. 13.3% were interested in lab-grown leather.

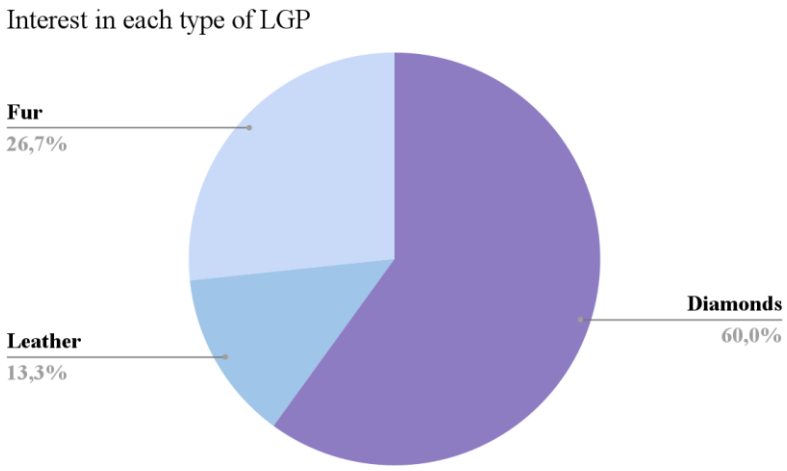

Figure 9. Interest in each type of LGP. Source: Author's own work.

Keywords associated with sustainability and LGMs within the responses:

Lab-grown diamonds	Lab-grown fur	Lab-grown leather
- Mining sector - Negative consequences for environment - Deaths - Lack of safety - Guarantees - Workers - Pressure - Technological advances - Quality - Earth - Lower costs - Purity - Temperature - Process - Land - Water - High demand - Value - Advance	- Commitment - Wildlife - Technology - Process - Fake - Plastic - Quality	- Vegetable - Plant-based - Potential - Pollution - Residues

Figure 10. Keywords and associations Q2. Source: Author's own work.

Adjectives associated with LGM alternatives:

Interesting, incredible, optimal, innovative, promising, effective, faster, great, fascinating.

Model B:

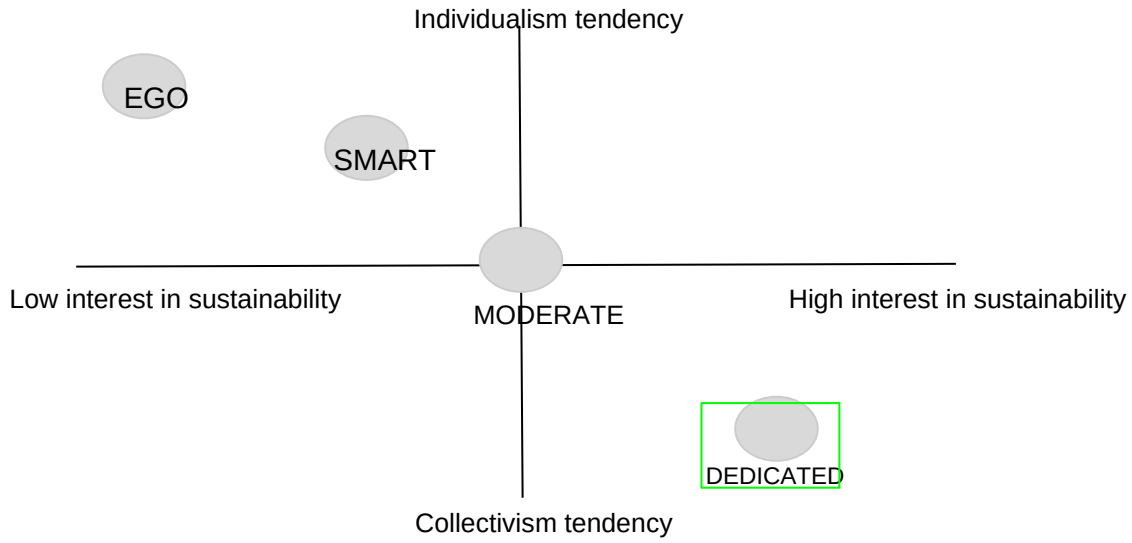

Figure 11. Model B Q2. Source : Author's own work.

Question 3: Now, I am going to mention two topics, please tell me without reflecting hard, the first three words that come to your mind when you hear each one of them.

- Luxury Industry

Mentioned words:

Figure 12. Word cloud with mentioned word related with ''luxury industry''. Source: Author's own work.

Frequency of repetition of each word:

Word	Times repeated
Exclusivity	11
Quality	5
Elegance	3
Status	2
Money	2
Clothing	2
Fashion	2
Convenience	1
Excellence	1
Popularity	1
Exploitation	1
Cost	1
Valuable	1
Costly	1
Scarce	1
Power	1
Cars	1
Jewelry	1
Expensive	1
Ostentatious	1
Wealth	1

Aspiration	1
Style	1
Class	1
High-standard	1

Figure 13. Frequency of repetition of each word Q3. Source: Author's own work.

Model A:

Focused on Luxury Industry	Focused on Self-image
Brand - Clothing - Fashion - Exploitation - Costs	**Social** - Exclusivity - Status - Money - Popularity - Power - Ostentatious - Wealth
Product - Quality - Excellence - Valuable - Costly - Scarce - Cars - Jewelry - Expensive	**Personal** - Elegance - Convenience - Aspiration - Style - Class - High-standard

Figure 14. Model A Q3. Source: Author's own work.

Model B:

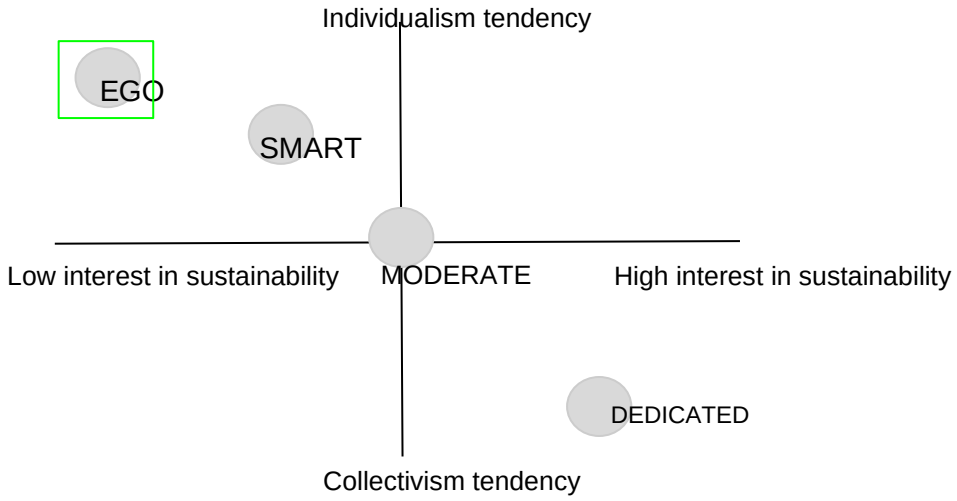

Figure 15. Model B Q3. Source: Author's own work.

Question 4: Now, I am going to mention two topics, please tell me without reflecting hard, the first three words that come to your mind when you hear each one of them.

- Sustainable luxury

Mentioned words:

Figure 16. Word cloud with mentioned words when ''sustainable luxury''. Source: Author's own work.

Frequency of repetition of each word:

Word	Times repeated

Environment	5
Innovation	3
Eco-friendly	3
Development	2
Nature	2
Recycling	2
Responsibility	2
Planet	1
Truth	1
Value	1
Future	1
Duty	1
Laboratory	1
Synthetic	1
Conscience	1
Kindness	1
Achievement	1
Fur	1
Diamonds	1
Exclusivity	1
Ecosystem	1
Stella McCartney	1
Responsible	1
Raw materials	1
Comfort	1
Fast fashion	1
Contribute	1
Sustainability	1

Cruelty-free	1
Fur-free	1
Handmade	1
Common welfare	1
Ethical	1
Creative	1
Caring	1
Flexible	1
Durability	1

Figure 17. Frequency of repetition of each word. Source: Author's own work.

Model A:

Focused on Luxury Industry	**Focused on Self-image**
Brand - Innovation - Development - Responsibility - Value - Duty - Laboratory - Achievement - Stella McCartney - Fast fashion - Creative - Flexible	**Social** - Environment - Eco-friendly - Nature - Planet - Truth - Future - Ecosystems - Sustainability - Common welfare
Product - Recycling - Raw materials - Synthetic - Fur	**Personal** - Conscience - Contribute - Comfort - Responsible

- Diamonds - Cruelty-free - Fur-free - Handmade - Durability	- Kindness - Exclusivity - Ethical - Caring

Figure 18. Model A Q4. Source: Author's own work.

Model B:

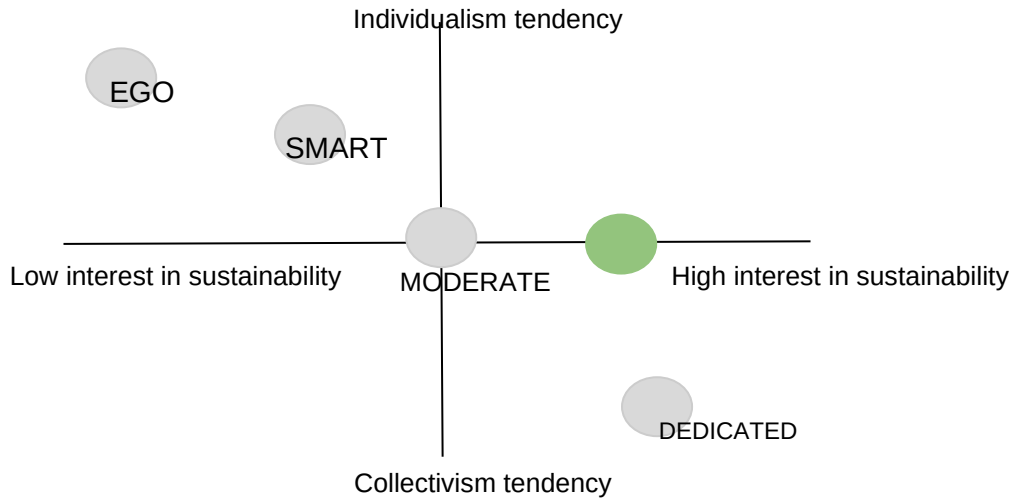

Figure 19. Model B Q4. Source: Author's own work.

Question 5: How often do you buy products that you consider luxury? Do you usually shop online or in-store? If you are not a regular luxury shopper, please imagine this is your first luxury purchase.

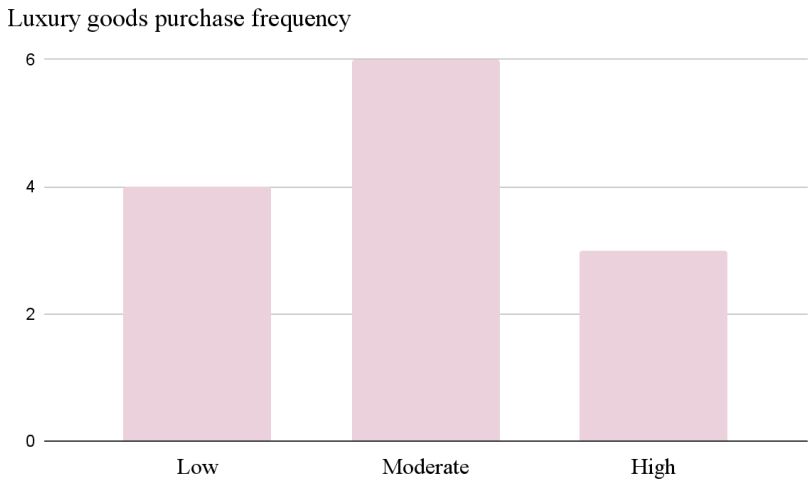

Figure 20. Luxury goods purchase frequency. Source: Author's own work.

40% of respondents reported a moderate consumption of luxury products per month, 26% a low frequency, and 5% a high frequency per month. The study considers a low frequency when the consumer makes between 0 and 2 luxury purchases per month, moderate when buying 2 to 3 times per month and high when buying more than 3 luxury products per month.

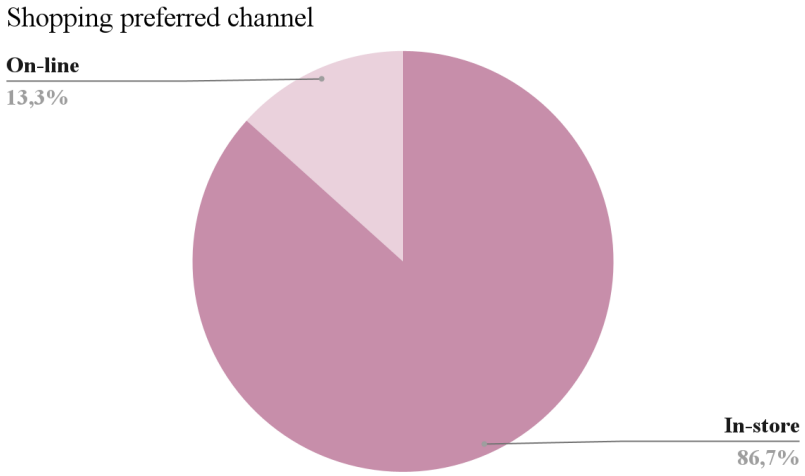

Figure 21. Shopping preferred channel. Source: Author's own work.

86% of respondents prefer to buy their luxury goods in-store, and 13% prefer shopping for luxury products online.

Question 6: Excluding the money and price factor, do you consider that you would change your consumption habits of luxury products if brands implemented lab-grown materials in the manufacturing of their products as a replacement for natural raw materials?

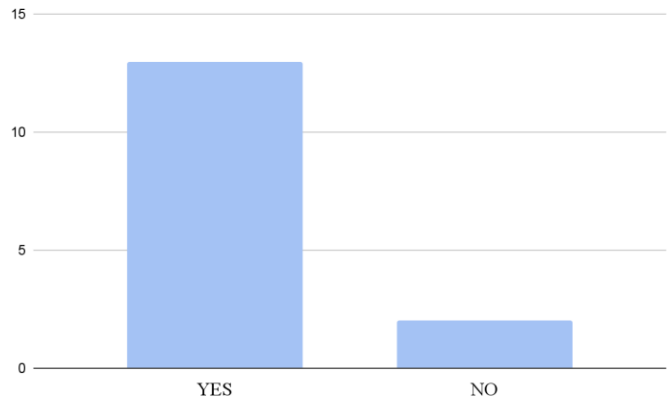

Figure 22. Change decision of consumption habits of luxury products if implementing lab-grown materials in manufacturing processes. Source: Author's own work.

87% of respondents said they would be willing to change their consumption habits of luxury products if lab-grown materials were implemented in the manufacturing processes of luxury brands to replace the main raw materials. Conversely, 13% of respondents expressed that they would prefer to maintain their luxury product consumption habits. Within the justifications of the interviewees for why they would change their consumption habits, only one orientation is evident: sustainability. In this question, the interviewees never mentioned anything related to personal emotions or the image they want to transmit to other people when consuming lab-grown products. All answers focus on environmental and animal sustainability. However, some

respondents conditioned their change of consumption only if the quality and durability of lab-grown products would remain intact.

Model B:

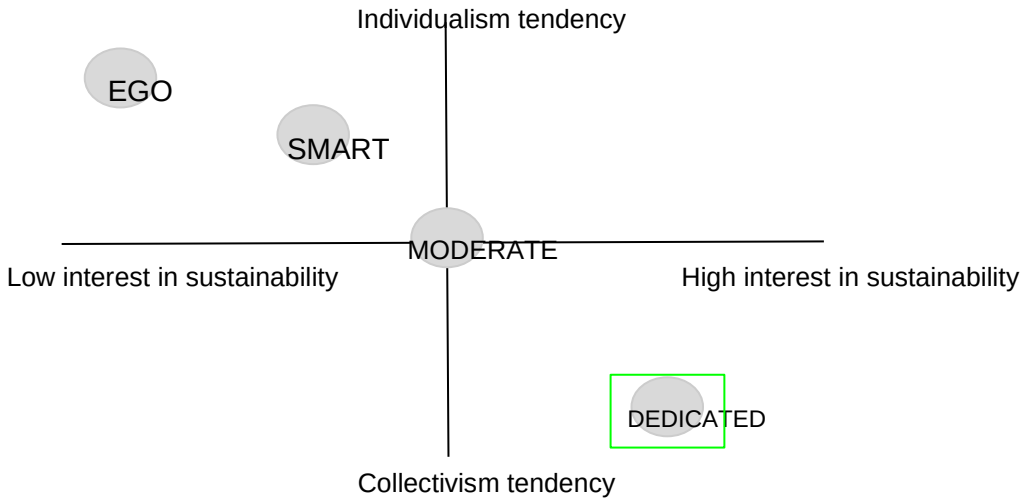

Figure 23. Model B Q6. Source: Author's own work.

Keywords associated with sustainability:

Environmental impact, respectful, pollution, damage, planet, animals, cruelty, vegan, animal welfare, cruelty-free.

Question 7: Do you consider that the use of LGPs has any effect on your perception of luxury products in terms of quality, exclusivity, or design?

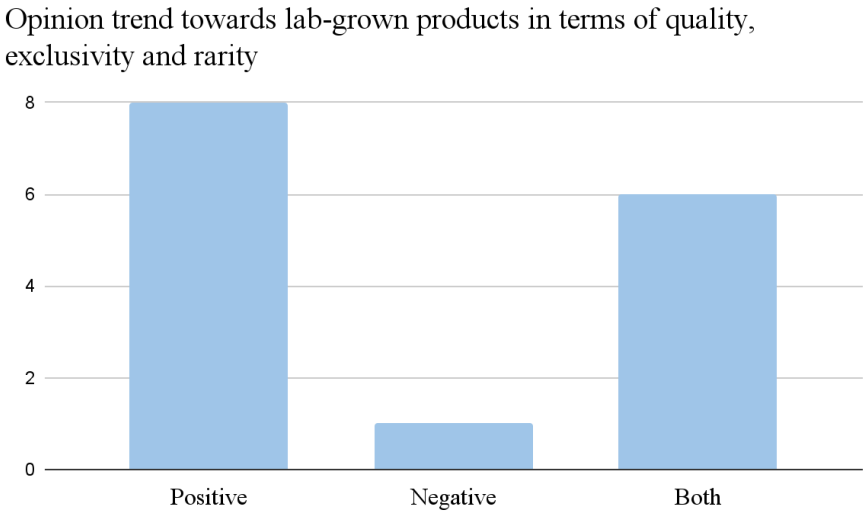

Figure 24. Opinion trend towards lab-grown products in terms of quality, exclusivity, and rarity. Source: Author's own work.

53% of respondents consider that LGPs may have a positive effect on their perception of luxury products in terms of quality, exclusivity, and design. 40% consider that LGPs can have both a positive and a negative effect on their perception of luxury products in terms of quality, exclusivity, and design. 7% of respondents believe that LGPs can have a negative effect on their perception of luxury products in terms of quality, exclusivity, and design. The following table classifies the keywords that represent the immediate associations expressed by the respondents for each opinion trend.

Positive effect on perception	Negative effect on perception
- Environmental awareness - Animals - Sustainability - Sustainable mindset - Social responsibility - Sales increasing	Loss of: - Exclusivity - Quality - Prestige - Rarity - Authenticity - Credibility - Scarcity - Intrinsic value - Standards - Resistance towards new products

	- Greenwashing

Figure 25. Effects in consumer perception. Source: Author's own work.

Some respondents conditioned their positive opinion trend based on factors such as:

- Marketing strategies presented by the brand
- Avoiding greenwashing
- Maintaining quality, exclusivity, and rarity
- Creating awareness through marketing and brand communication
- Marketing objectives

Model B:

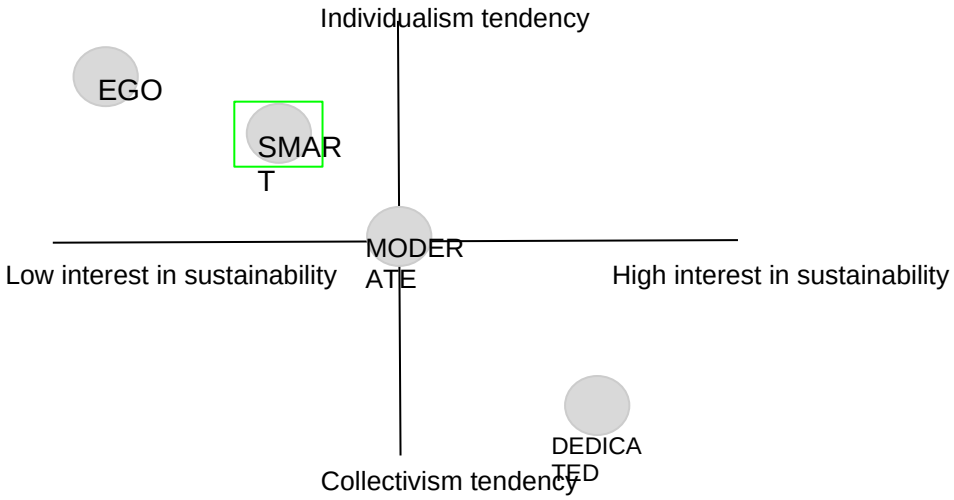

Figure 26. Model B Q7. Source: Author's own work.

Question 8: Briefly describe your motivations for buying luxury products.

Keywords associated with luxury products purchase motivation:

Figure 27. Word cloud with mentioned words when asking about shopping motivations. Source: Author's own work.

Frequency of repetition of each word:

Word	Times repeated
Quality	13
Brand Reputation	7
Fashion	6
Tendencies	4
Status	4
Durability	3
Investment	2
Design	2
Art	2
Exclusivity	2
Price	1
Comfort	1
Confidence	1
Expectations	1
Innovative	1

Rare	1
Tastes	1
Satisfaction	1
Affordability	1
Value	1

Figure 28. Frequency of repetition of each word. Source: Author's own work.

Model A:

Focused on Luxury Industry	**Focused on Self-image**
Brand - Reputation - Fashion - Tendencies - Innovative - Value	**Social** - Status
Product - Quality - Durability - Design - Art - Price - Rare - Affordability	**Personal** - Investment - Exclusivity - Comfort - Confidence - Expectations - Tastes - Satisfaction

Figure 29. Model A Q8. Source: Author's own work.

Model B:

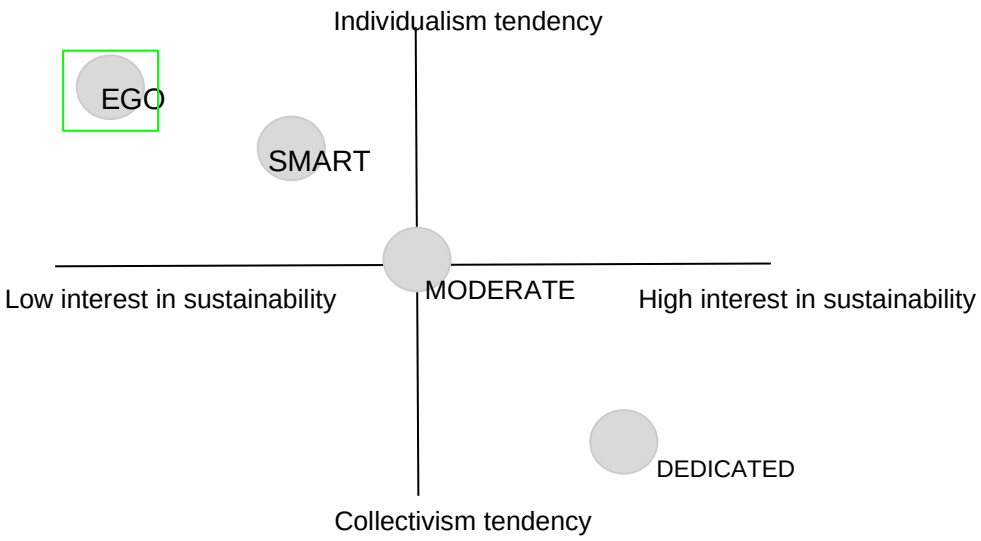

Figure 30. Model B Q8. Source: Author's own work.

Question 9: From the previously exposed cases, which one called your attention the most and why?

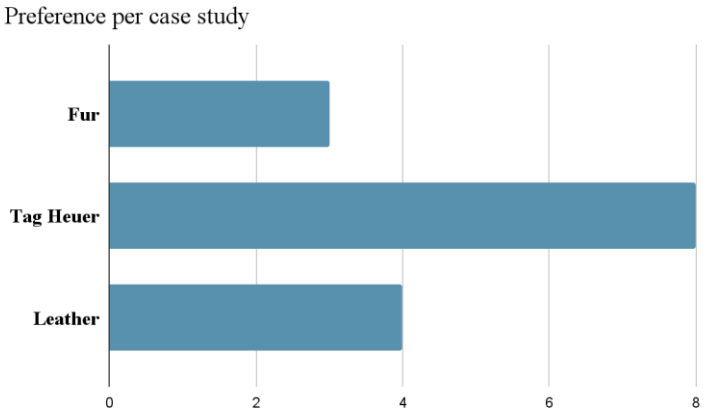

Figure 31. Preference per case study. Source: Author's own work.

53% of the interviewees considered that Tag Heuer and lab-grown diamonds were the ones that caused them the most interest. 27% of the interviewees expressed interest in the case of lab-grown leather. 20% of the interviewees were more interested in the lab-grown fur case.

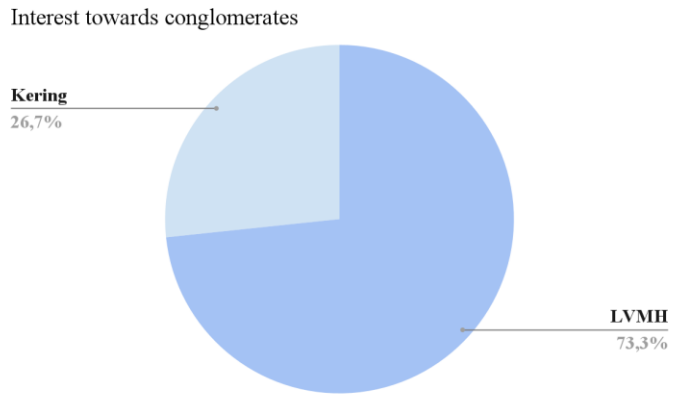

Figure 32. Interest towards conglomerates. Source: Author's own work.

73% of respondents were more interested in the LGP implementation initiatives presented by LVMH, while 27% were more interested in the initiatives presented by Kering. This result shows a directly proportional correlation to the number of cases presented by each conglomerate; LVMH has two cases and Kering one.

Keywords associated with interest in case studies:

Lab-grown diamonds	Lab-grown fur	Lab-grown leather
- Environment impact - Exploitation - Damage - Water scarcity - Mining - Land - Catastrophes - Non-differentiable	- Animals - Suffering - Harmful - Biopsy	- Animals - Suffering - Animal abuse - Circular economy - Waste - Pollution

- Value - Decoration - Natural		

Figure 33. Keywords associated Q9. Source: Author's own work.

Model A:

Focused on Luxury Industry	Focused on Self-image
Brand - Value - Reputation - Wastes - Circular economy	**Social** - Animals - Environment - Exploitation - Damage - Water - Mining - Land - Sustainability - Abuse
Product - Quality - Characteristics - Diamond - Wines - Champagne	**Personal**

Figure 34. Model A Q9. Source: Author's own work.

Model B:

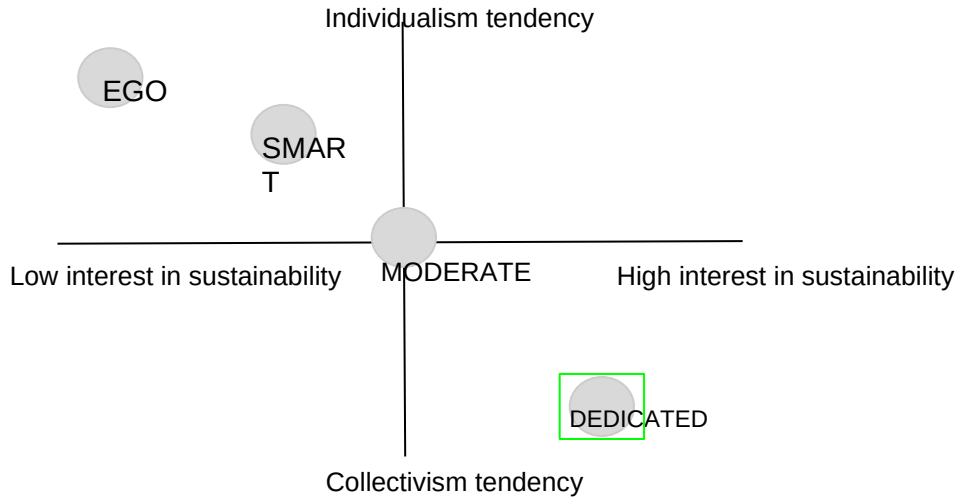

Figure 35. Model B Q9. Source: Author's own work.

Question 10: Among the brands/conglomerates mentioned above, which one would you be interested in buying LGP? why?

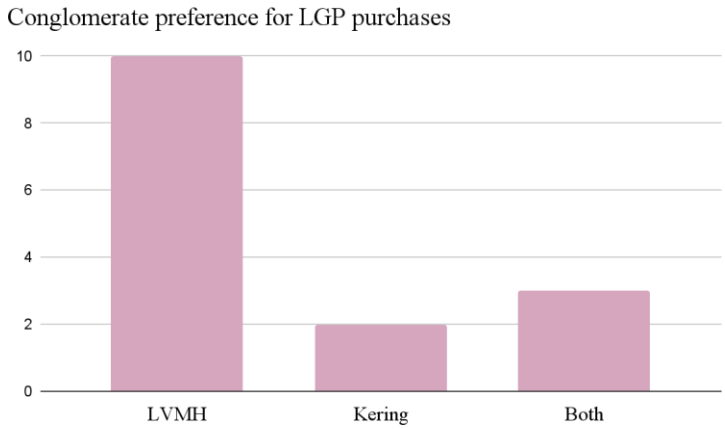

Figure 36. Conglomerate preference for LGP purchases. Source: Author's own work.

67% of respondents say they would make their LGP purchases in any of the brands belonging to LVMH. 20% would make their LGP purchases at any of the LVMH and Kering brands. 13% of respondents are inclined to make their LGP purchases in the brands belonging to Kering. When respondents referred to LVMH, they sometimes specified the brand they would buy. 20%

mentioned Louis Vuitton, 30% Tag Heuer and 50% referred generally to the conglomerate or to other brands of the conglomerate such as Yves Saint Laurent and Dior.

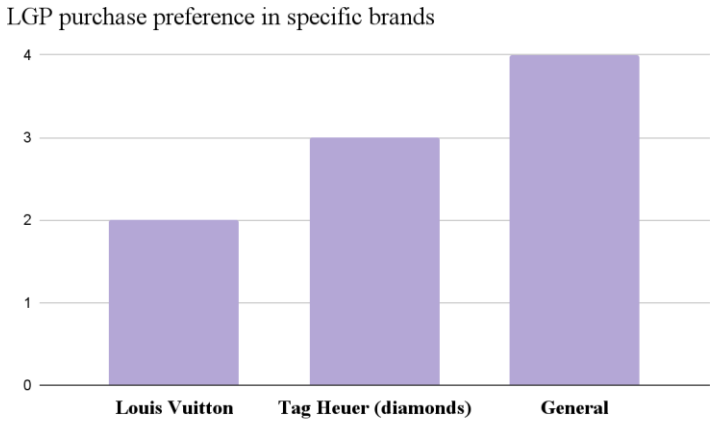

Figure 37. LGP purchase preference in specific brands. Source: Author's own work.

Keywords associated with brand or conglomerate preference when purchasing LGP

Focused on Luxury Industry	Focused on Self-image
Brand - Skepticism - Credibility - Innovation - Traceability - Pionering	**Social** - Environment - Environmental awareness - Helping - Cruelty - Animal - Mining
Product - Quality - Beautiful - Bags - Design - Diamonds - Leather	**Personal** - Taste - Budget - Regret

- Flawless	

Figure 38. Keywords associated Q10. Source: Author's own work.

Model B:

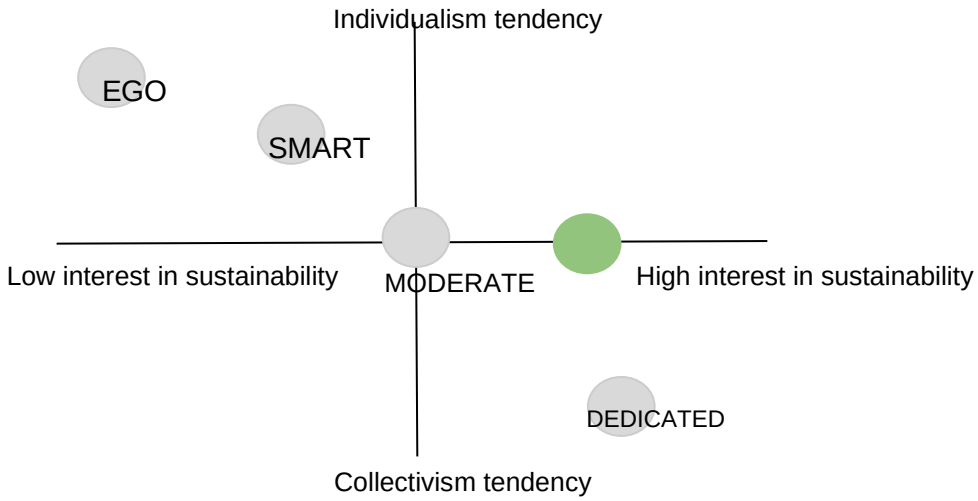

Figure 39. Model B Q10. Source: Author's own work.

Question 11: Imagine that you purchased some LGP from one of these brands, would you appreciate that immediately the product has some specific way of recognition that shows that it is a sustainable product made from lab-grown materials? Whether in the product design, logo, or any other way?

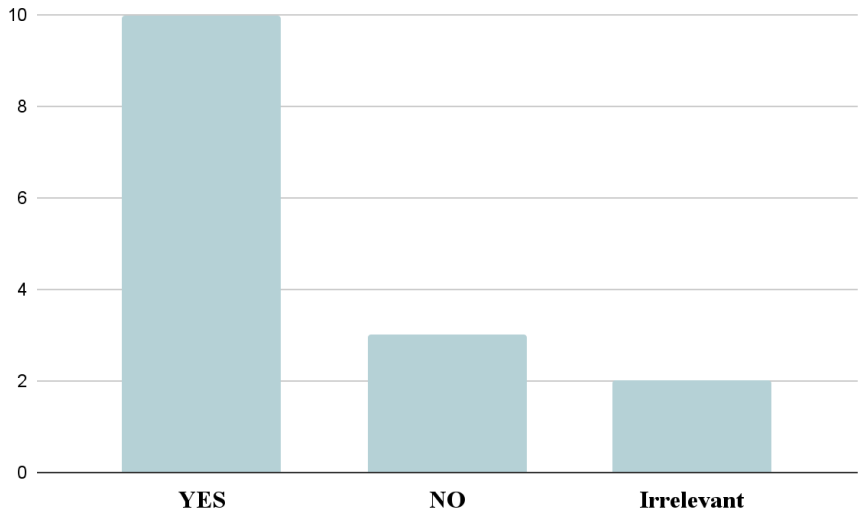

Figure 40. Preference of recognition of sustainable product and LGM in luxury products. Source: Author's own work.

67% of respondents prefer LGPs to have some kind of visual element that allows the identification and recognition of a product made from laboratory-grown raw material, 20% prefer to simply keep the LGP without any visual distinctiveness. For 13% it represents an irrelevant aspect.

Keywords associated with a preference for distinctive elements allowing the LGPs to be identified at a glance

Focused on Luxury Industry	Focused on Self-image
Brand - Added value - Endorsement - Identity - Identification - Uniqueness - Storytelling	**Social** - Animal - Cruelty-free - Promote sustainability - Mistreatment - Change consumption habits - Impact consumers - Supporting
Product - Discreet - Subtle - Logo - Design - Color	**Personal** - Feeling better - To be noticed

Figure 41. Model A Q11. Source: Author's own work.

Model B:

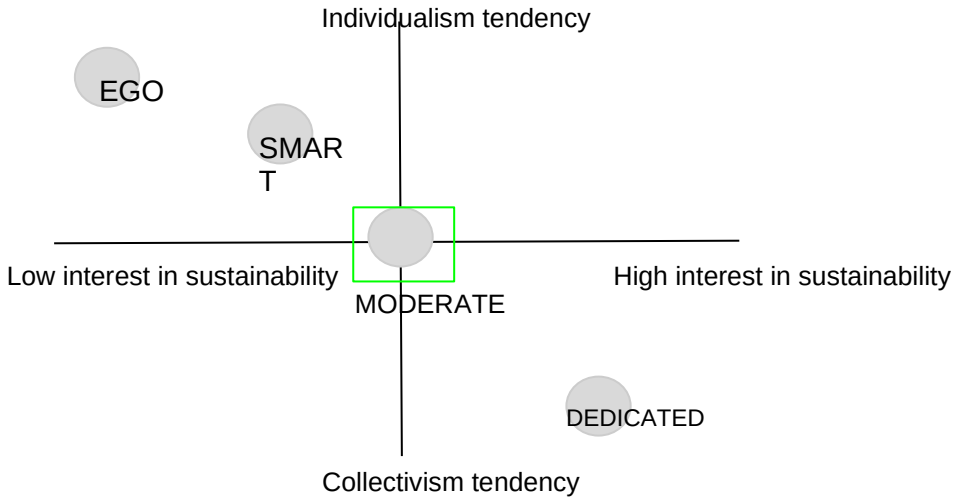

Figure 42. Model B Q11. Source: Author's own work.

Question 12: If any of the luxury brands were to launch a collection or an LGP would you like them to continue with their traditional marketing or would you prefer them to be innovative in their marketing and communication strategies, to highlight the sustainable approach?

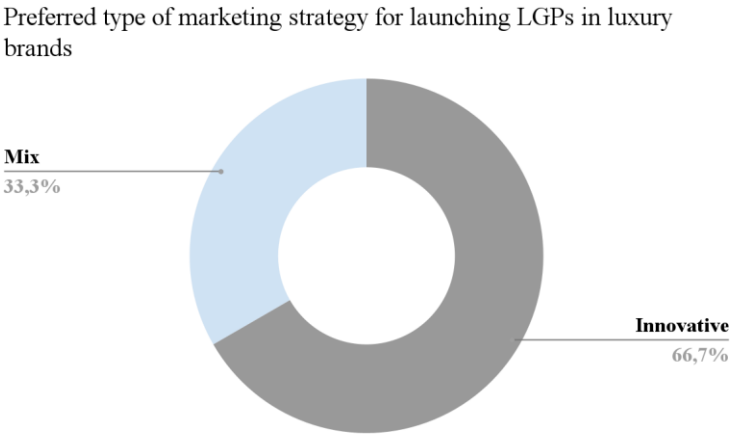

Figure 43. Preferred type of marketing strategy for launching LGPs in luxury brands. Source: Author's own work.

67% of respondents prefer innovative marketing strategies in the launch of LGP by luxury brands, while 33% would prefer a strategy that strikes a balance between traditional and innovative luxury marketing strategies. It becomes evident that respondents are genuinely in search of innovation, as none of them preferred to stick completely to traditional strategies.

Keywords associated to the preference for traditional or innovative marketing strategies

Focused on Luxury Industry	Focused on Self-image
Brand - Reach audience - Essence - Launching event - Aggressive - Force - Value proposition - Commitment - Iconic - Controversial - Storytelling - Exclusivity - Clear - Sophistication - Risks	**Social** - Environmental awareness - Attention - Cities - Worldwide - Socially responsible - Raise awareness
Product - Harmony - Samples - Iconic - Cruelty-free - Characteristics - Inferior	**Personal** - Desire - Attraction - Disorientation - Elegance - Aspirational

Figure 44. Model A Q12. Source: Author's own work.

Model B:

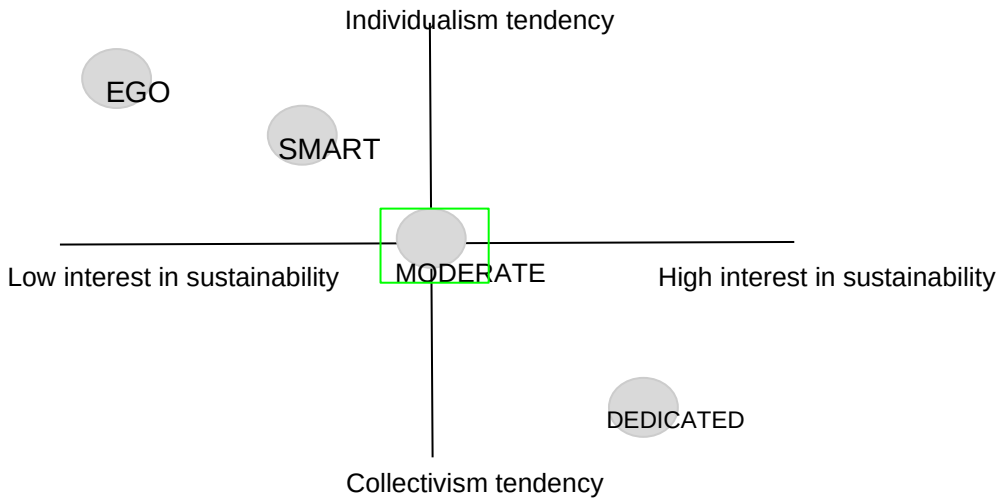

Figure 45. Model B Q12. Source: Author's own work.

Question 13: Now, I am going to mention two topics, please tell me without reflecting hard, the first three words that come to your mind when you hear each one of them.

Mentioned word:

- Lab-grown products

Keywords associated with lab-grown products:

Figure 46. Word cloud with associations with ''lab-grown products'' Q1. Source: Author's own work.

Word	Times repeated
Sustainability	9
Innovation	5
Progress	4
Change	4
Development	3
Future	2
Environment	2
Conservation	1
Animals	2
Opportunity	1
Respect	1
Responsibility	1
Advance	1
Science	1
Growth	1
Breakthrough	1
Differentiator	1
Impact	1
Reduction	1
Technology	1

Figure 47. Frequency of repetition of each word. Source: Author's own work.

Model A:

Focused on Luxury Industry	Focused on Self-image
Brand - Innovation	**Social** - Sustainability

- Progress - Development - Opportunity - Advances - Science - Growth - Technology	- Change - Future - Environment - Conservation - Animals - Impact - Reduction
Product - Differentiator	**Personal** - Respect - Responsibility

Figure 48. Model A Q13. Source: Author's own work.

Model B:

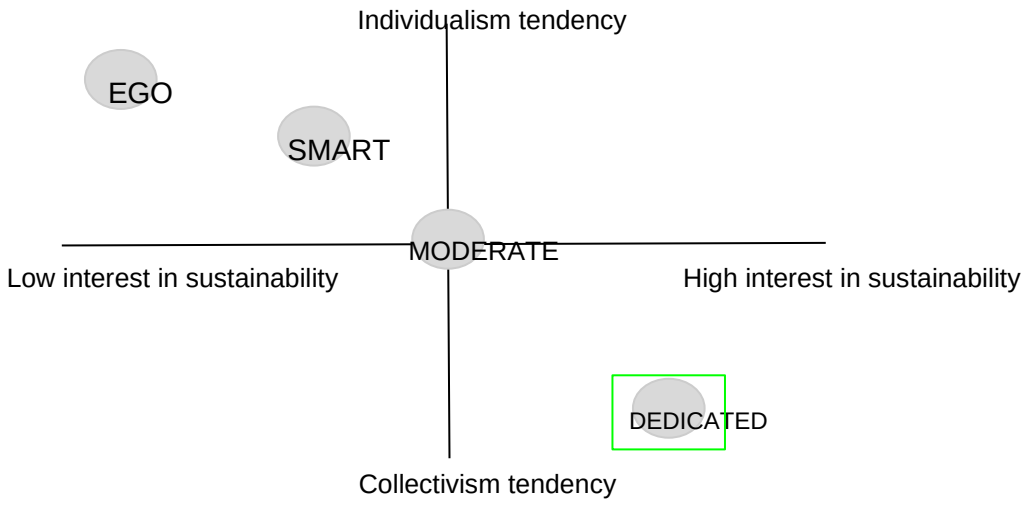

Figure 49. Model B Q13. Source: Author's own work.

Question 14: Now, I am going to mention two topics, please tell me without reflecting hard, the first three words that come to your mind when you hear each one of them.

- **Luxury industry**

Keywords associated with the concept:

Figure 50. Word cloud associations with ‘’luxury industry’’. Source: Author’s own work.

Frequency of repetition of each word:

Word	Times Repeated
Innovation	5
Development	5
Costly	3
Awareness	3
Responsibility	3
Environmental	3
Exclusivity	2
Impact	2
Eco-friendly	2
Durability	2
Contribution	2
Solution	2
Projection	1
Comfort	1
Contribute	1

Solution	1
Positive	1
Future	1
Reuse	1
Quality	1
Leadership	1
Futurism	1
Strategies	1
Projects	1
Sustainability	1

Figure 51. Frequency of repetition of each word. Source: Author's own work.

Model A:

Focused on Luxury Industry	Focused on Self-image
Brand - Innovation - Development - Responsibility - Solution - Positive - Leadership - Strategies - Projects	**Social** - Awareness - Environmental - Impact - Eco-friendly - Future - Futurism - Sustainability
Product - Costly - Durability - Reuse - Quality	**Personal** - Exclusivity - Contribution

Figure 52. Model A Q14. Source: Author's own work.

Model B:

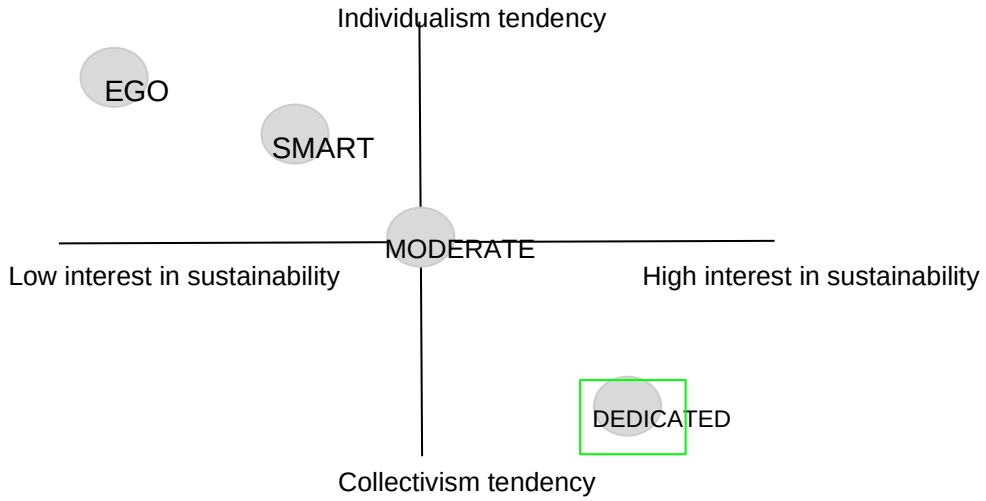

Figure 53. Model B Q14. Source: Author's own work.

Model A comparison of perceptions and associations obtained regarding the ''luxury industry'' before and after presenting the case studies. (Questions 4 and 14)

Question 4:

Focused on Luxury Industry	Focused on Self-image
Brand - Innovation - Development - Responsibility - Value - Duty - Laboratory - Achievement - Stella McCartney - Fast fashion - Creative	**Social** - Environment - Eco-friendly - Nature - Planet - Truth - Future - Ecosystems - Sustainability - Common welfare

- Flexible	
Product - Recycling - Raw materials - Synthetic - Fur - Diamonds - Cruelty-free - Fur-free - Handmade - Durability	**Personal** - Conscience - Contribute - Comfort - Responsible - Kindness - Exclusivity - Ethical - Caring

Figure 54. Model A Q4. Source: Author's own work.

Question 14

Focused on Luxury Industry	Focused on Self-image
Brand - Innovation - Development - Responsibility - Solution - Positive - Leadership - Strategies - Projects	**Social** - Awareness - Environmental - Impact - Eco-friendly - Future - Futurism - Sustainability
Product - Costly - Durability - Reuse - Quality	**Personal** - Exclusivity - Contribution

Figure 55. Model A Q14. Source: Author's own work.

Model B:

Question 4 = does not classify within any type of consumer (new consumer type)

Question 14 = Dedicated consumer

Question 15: Finally, briefly describe your opinion on LGPs, how do you see the long term outlook for LGPs in the luxury industry?

100% of respondents have a positive and promising outlook on the future of LGPs in the luxury industry in both the medium and long term. The following diagram presents a general outlook on the long-term vision of LGPs within the industry over the long term:

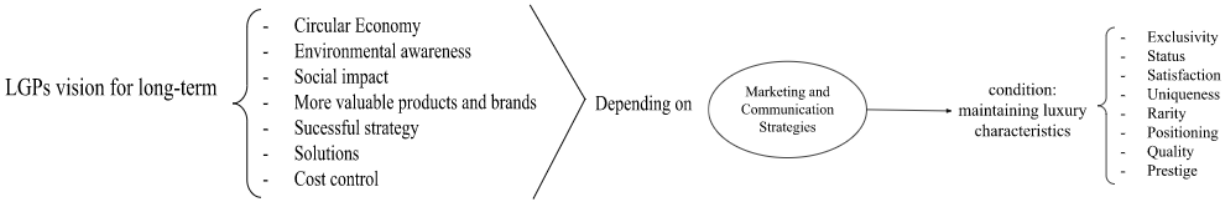

Figure 56. Outlook on the long-term vision of LGPs within the industry. Source: Author's own work.

Model B:

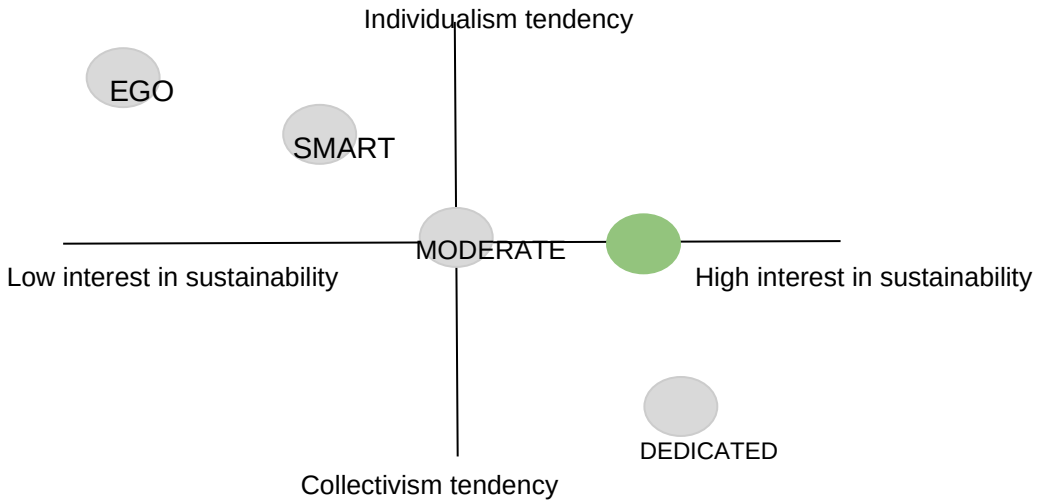

Figure 57. Model B Q15. Source: Author's own work.

Found patterns:

Model A:

Below the most repeated keywords within each category throughout all the questions are gathered.

Focused on Luxury Industry	Focused on Self-image
Brand - Value - Innovation - Development - Reputation - Circular economy - Storytelling - Responsibility	**Social** - Environmental - Impact - Ecosystems - Animal welfare - Planet - Status - Awareness - Damage - Sustainability
Product - Quality - Cruelty-free - Design - Characteristics - Durability - Eco-friendly	**Personal** - Exclusivity - Elegance - Comfort - Awareness - Investment

Figure 58. Found patterns in Model A. Source: Author's own work.

Model B:

Based on the analysis of the keywords found in the responses, a type of consumer was determined according to collectivism or individualism tendencies, and the level of interest in sustainability expressed by the interviewees in a general way in each question.

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
D	D	E	!	-	D	S	E	D	!	M	M	D	D	!

Figure 60. Found patterns in Model B. Source: Author's own work.

- Q = Question
- D = Determined consumer
- S = Smart consumer
- E = Ego consumer
- M = Moderate consumer
- - = Not applicable
- ! = new consumer type

Determined consumer = 40% of questions

Smart consumer = 7% of questions

Ego consumer = 13% of questions

Moderate consumer = 13% of questions

New consumer type = 20% of questions

6. Conclusions and Practical application

This research questioned compatibility and the link between sustainability and the concept of luxury. Different positions emerged both for and against the link, considering that at first glance both concepts may seem contradictory or incompatible due to their essence and nature. However, thanks to consumers' increasing interest in sustainability and social responsibility in the last decades, the luxury industry started to propose strategies focused on sustainable and respectful production.

Through different scenarios and questions, this study aimed to discover consumers' perceptions regarding the implementation of lab-grown products as a substitute for traditional raw materials used in the manufacture of luxury goods. Thanks to the approach of two analysis models applied to the overall answers to each question, it was possible to identify patterns of associations and keywords within the answers of the interviewees. Findings are based on the division of the interview into two sections. In the first part, information was provided only about the concept of each lab-grown material, while in the second part, case studies were presented demonstrating the implementation of these materials in the value chain of the two most important conglomerates in the industry. Additionally, figures and data focused solely on sustainability and social responsibility were presented, which positioned lab-grown materials as the ideal solution to different social and environmental problems.

From Model A, Model B was obtained. In the patterns found in Model B, during the first section of the interview, consumers had a tendency to position themselves within the dedicated consumer and the ego consumer. From the second section of the interview, the ego consumer pattern changes and becomes a moderated consumer. By informing the consumer about the

existing problems related to sustainability, he/she begins to show greater interest and awareness on the subject and starts to shift his/her consumption tendencies based on a more collective rather than an individual approach. To illustrate this trend, it is worth mentioning that 40% of the responses tended to show a dedicated consumer. There is a tie between ego and moderate consumers, both with a result of 13% before and after the second section of the interview, respectively.

Ideally, consumer perceptions of sustainability would be expected to show a majority of dedicated consumers as can be seen in this study. However, when it comes to the luxury industry, the expectations that consumers have of these types of products, the "ideal" type of perception changes.

If it were a dedicated consumer, it would be a consumer who has a high interest in sustainability and who additionally has a high tendency towards collectivism, meaning that their consumption decisions would be based on products that do not hurt society and the environment, regardless of whether they must sacrifice certain characteristics such as quality, exclusivity, rarity, and the status that both the brand and the product provide. For this reason, this type of consumer differs completely from the usual luxury consumer, due to the nature and essence of the industry.

When referring to the ego and moderated perception trend, these consumers also do not fully represent the balance between luxury and sustainability. The ego consumer is not immersed in seeking his or her personal benefit and does not show any interest in sustainability. On the other hand, the moderate consumer is in a very ambiguous position that does not allow for

establishing clear and consistent marketing and communication strategies that can last in the long term. It is for this reason that the study proposes a new type of consumer within Model B thanks to the analysis of the patterns obtained from the associations and the keywords classified in Model A. Above all, it can be verified thanks to the analysis of the comparison of the models of question 4 and question 14 (Appendix). This comparison shows that before the respondents were approached with figures and data on the negative impact of traditional raw materials on both the environment and society, the respondents had an individualistic consumption tendency. However, in the second part of the interview (presentation of figures and data on impact and sustainability), the interviewees shifted to dedicated consumption.

(Gibson & Seibold, 2014) proposes the concept of "eco-luxury products", which allows the establishment of a connection between brands and consumers to meet both parties' needs and expectations. Based on this concept, a new type of consumer is proposed within the model called the "eco-luxury consumer". This type of consumer is located between the dedicated consumer and the moderated consumer (Appendix 3). It is distinguished by demonstrating an intermediate level between individualism and collectivism with a high and growing interest in sustainable initiatives. It is a consumer who thinks of his or her personal interests and is not willing to sacrifice characteristics of luxury products such as quality, durability, rarity, exclusivity, and status. However, this type of consumer seeks a balance by opting for sustainable alternatives within the range of luxury products and goods.

Eco-luxury consumers are presented as the ideal type of LGP consumer in the luxury industry. However, it should be noted that this type of consumer does not represent the majority

of those interviewed. On the contrary, it was an emerging trend throughout the interview, due to the presentation of information that positions LGPs as the solution to social and environmental problems. Therefore, it is evident that luxury brands should focus on indirectly building this consumer trend through their marketing and communication strategies.

Question 15 presents an outline summarizing the interviewees' expectations and associations after exposure to the two sections of the interview. It can be seen that the interviewees' expectations are balanced between sustainability and the characteristics of the luxury industry.

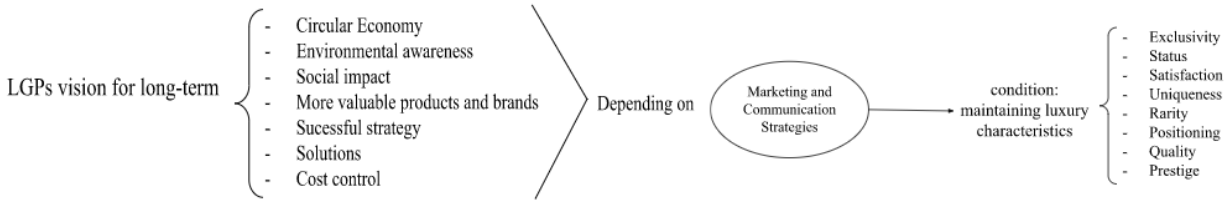

Figure 60. Outlook on the long-term vision of LGPs within the industry. Source: Author’s own work.

Respondents condition their consumption of luxury LGP to the maintenance of luxury characteristics within their products and additionally include marketing and communication strategies as the means to adequately convey this balance.

6. Limitations and future directions

In the development of this study, some limitations were found, which will be explained below. To begin with, the main limitation is the lack of prior research concerning lab-grown

products and materials in any type of industry; it is a very recent topic, so the study dealt with it in a very general way. It is possible to find papers regarding sustainability, synthetic materials, luxury consumer behavior, and perception, and sustainable luxury, among other topics. However, the challenge arises when trying to find reference information about the use of lab-grown materials in the luxury industry, or even in other sectors.

In terms of data collection, communication, time, and distance are considered limiting for this study. It was a challenge to conduct the interviews because the interviewees are from different backgrounds. Although technology was a helpful tool for communication, the responses and the interview would have been smoother if conducted face-to-face. Likewise, this would have allowed the application of other research methods such as focus groups to present the interviewer with a real sample of the products to establish comparisons between traditional products and LGPs.

Having presented the limitations and emphasizing the lack of previous research, the interview questions posed in this study delve into different general topics that may be useful for future research that seeks to be more specific. For example, to establish comparisons between the purchase of LGPs either in-store or online, the use of LGMs in the production of products depending on their classification in the luxury pyramid, to include within the research the economic, occupational, and generational factors, the study applied business cases taking into account the reputation of each brand or conglomerate in terms of sustainability and CSR, the approach and implementation of marketing and communication strategies for this type of

products, among many more possible future directions that this topic has due to its novelty and long-term vision.

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