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Cultured Meat: Exploring the influence of message framing and the mediation role of emotions

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Chapter 1

Introduction

The role of meat in food consumption has very deep roots. However, the early ancestors of sapiens, were not carnivores. After the great mass extinction of the dinosaurs, about 65 million years ago, Purgatorius, our first ancestor, had carved out its own niche in the branches of the pluvial forests. It didn't look anything like a hominid or even a monkey, but was instead a small rodent with a diet consisting of plenty of fruit and flowers. Beginning with the evolution of Purgatorius, many species of mammals appeared including the first small apes and also large apes similar to gorillas. The archaeological findings, exclude however that the diet of these species could be composed of meat in not negligible quantity.

To count the first primate that had a small part of carnivorous diet, we have to go back to about 4 million years ago, when the first Australopithecus made their appearance. If these ancestors had a diet composed for the most part by vegetables, it is likely that they occasionally ate meat and it was from them that primates consumed it in a gradually more significant amount (Zaraska, 2016). In the last period of paleolithic, our ancestors became more addicted to meat since they had as food venison mostly accompanied by fruit and vegetal roots. Meat and fish consumption has been fundamental for their brain development and changed physiological and metabolic adaptations that led to modern humans (Mann, 2018).

The consumption of meat continued until arriving, evolving in entity and modalities thanks, among other things, to the discovery of breeding, in the modern age.

During the middle age, meat was a status symbol and people who could afford it, stored mostly thanks to salt, were few. It was usually eaten through broth to exploit it in the most efficient way possible. Although venison was very popular, the majority of meat came out from domestic animals. In the occidental world, beefs were not that popular because were employed in the production of milk and work in the fields. On the contrary, pigs were widely eaten since they were cheaper to raise (Birri, 2015).

The real turning point, in which the meat production chain actually became an industry, took place at the end of the nineteenth century in the U.S when, a real mass industry began to develop around

cattle breeding and slaughtering activities. The innovations that gave a great boost to efficiency were the refrigerated train cars and new slaughterhouses. The latter, in particular, had standards, processes and techniques that influenced all other areas of modern industry. Mass production, division of labor and the assembly line were first adopted by the slaughter industry and only after, Taylor was able, with the necessary modifications, to implement them in Ford's industries (Rifkin, 1992).

Analyzing better, in this case it was a chain of "disassembly". A new tool was introduced: the conveyor belt. The killed animals, hanging upside down from the conveyor belt above the workers, were dismembered, and each of the workers took care of a single phase of the process which was always the same.

Nowadays, the meat industry is expected to value 1.5 trillion dollar in 2022 (Shahbandeh, 2019) and to grow stably seen that world's population is going to reach more than 9.1 billion by 2050 (United Nations, 2019). Per capita meat consumption is forecasted to remain steady at around 35 kilograms of meat per year. Moreover, the industry provides the 37% of the global protein need.

Such important numbers cannot fail to have important repercussions worldwide. While meat is a formidable source of protein and sustenance for humans, there are two important drawbacks.

The first issue is environmental. Today the meat industry is responsible of the 14% of global emissions, more than the entire transport industry (Falduto, 2019). Meat production is a decidedly inefficient system of food production from a resource use perspective. Its production involves the use of 83% of agricultural land and one third of the water used for agriculture. The link between meat production and climate change, however, lies in the enormous quantities of greenhouse gases that it releases into the atmosphere. First of all, raising animals involves the direct emission of an important greenhouse gas: methane.

Methane is particularly damaging to the climate, being capable of trapping 84 times more heat than CO2 in the first two decades after it is released into the atmosphere. On an aggregate level, the flatulence of hundreds of thousands of cows has a significant impact, accounting for about 30% of global methane emissions (Department for Environment Food and Rural Affairs, 2006).

Livestock farming is also indirectly responsible for the emission of CO2 into the air. To support the 70 billion livestock animals that now populate the planet, hundreds of thousands of hectares of forests and woodlands have been destroyed in recent decades. According to WWF about 80% of the deforestation of the Amazon rainforest is due to the need to make room for cattle farms (Nepstad et al, 2008)

The second issue arising from the mass production of meat is the ethical one. Indeed, animals are brutally killed and deprived of their freedom in contrast to what is stated in the Universal

Declaration of Animal Rights (UNESCO, 1978). Many people, especially those who live in contact with animals, empathize with them recognizing in them behaviors and emotions typical of humans. The fact that they felt emotions has always been clear from an external point of view, but extremely difficult to demonstrate scientifically because the risk of misunderstanding, to humanize purely animal emotions was high. To date, however, it has been scientifically demonstrated, in more than one research, that animals have emotions like those normally felt by humans (Briefer et al, 2015) (Lesimple et al, 2011).

More and more people, moved by their feelings, are becoming vegan or vegetarian (Ploll & Stern, 2020) and even actively involved in protests and initiatives against the consumption of meat as evidenced by the formation of various animal rights organizations such as Mercy for Animals and Farm Animal Rights Movement (FARM) and their activities.

To overcome these ethical and sustainability issues discussed below, multiple solutions have been developed. Even if the percentage of vegetarians and vegans is growing in Italy (EURISPES, 2020) and in the European Union (IFES, 2017), the majority of the collectivity does not want to deprive itself of meat, therefore, rather than trying to limit its consumption, attempts have been made to find attractive alternatives. To date, the resolution of these problems seems to lie in the technological development of alternatives reminiscent of flesh.

The first alternative, already easily available in supermarkets, is the plant-based meat. Plant-based is literally meat made from plants. It is planned and created to remind, taste like, and nurture like conventional meat. Its popularity is growing year after year and its market share is increasing in the world (Polaris Market Research, 2020) and in Italy (Agriculture and Agri-Food Canada, 2019), as opposed to traditional meat which is expected to remain stable in Italy (Eurostat, 2020).

However, the plant-based meat market is not comparable to the traditional one, just think that in Italy the turnover of this alternative industry is about 225 million dollars (Agriculture and Agri-Food Canada, 2019) while that of the typical one is about 13 billion dollars (Eurostat, 2020). The reason for this distance lies primarily in two reasons. The first is that consumers prefer traditional meat to vegetable meat (Ipsos, 2018), the second is that meatballs, sausages and vegetable burgers cost more than those produced with animals.

The second alternative concerns a new type of meat that only came to light in 2012: cultured meat. This is an artificial edible meat created in laboratory starting from beef or other animals stem cells culture. Is considered a product of high tissue engineering since its creator, Mark Post, had the idea when he thought that in his laboratory, could be produced meat in vitro as well as pieces of tissue to be used in surgical rooms (Post, 2012).

The idea turned out to be a winner. In 2013, the first burger without the use of animals was produced for the modest sum of $330000 (Singer, 2013). Obviously, with such a price, cultured meat is totally unaffordable, but in recent years, technological advances in the field have made it much less expensive and have brought closer the date of its entry into the mass market. The same burger produced for more than $300 thousand in 2013 is now available for about $10 (Axworthy, 2019). To date, many realities are active to be able to produce this meat at lower prices. Moreover, a restaurant in Singapore is already serving it to its customers (Scipioni, 2020).

1.1 Research aims and objectives

Based on this information, both alternatives are valid but consumer perceptions of plant-based meat have already been abundantly studied and little research attention has been paid to the study of consumer perceptions toward cultured meat. The present research, therefore, will focus on cultured meat, trying to provide new insights on the variables influencing its acceptance and trying to find the right incentives to help companies in view of its future launch on the market.
Specifically, the objectives of the research are listed below:

- Of particular interest is the investigation of the framing of promotional messages. In fact, it has been demonstrated how a message presented in different ways can lead consumers facing a certain decision to make different and predictable decisions (Tversky & Kahneman, 1981).

- Another research objective is to find out which focus might be relevant to consumers and which might improve market responses through its use.

- A third objective of the present work is to investigate the influence of demographic variables such as age, gender and level of education, in order to gain insight into which market segments might be attractive in the future and what type of communication to use with them.

1.2 Thesis organization

The following study will be structured as follows: In chapter 2 we will review the literature on cultured meat, and therefore the state of scientific advancement of it, the type and degree of ethical and environmental benefits it brings, the degree of consumer acceptance and the factors, communicative and demographic, that influence the favorability and rejection of it. In the same

chapter will also be investigated the theory of message framing, i.e. what is it and in which contexts could be more effective a negative and positive framing, and the topics, the focuses that have proven to be more effective in eco-friendly communication, animal rights communication and in the meat industry with consumer purchase drivers.

In the third chapter, starting from the insights gained in the study of the literature, the topics of interest of the research will be explained and the hypotheses that will be investigated will be formulated. At the end of it, a conceptual model will be drawn up that summarizes all the hypotheses of the study.

The fourth chapter will be quite articulated. First of all, the methodology implemented for the present study will be explained, along with the nature of the data collected and their preliminary treatment. A large part of this chapter will be devoted to statistical analysis of data. Various tests will be carried out, decided from time to time depending on the hypotheses and the type of variables involved, in order to reach a conclusion on whether or not to accept the proposed hypotheses.

In the fifth and final chapter, the objectives of the study will be summarized, along with the main statistical results. Then the theoretical and practical implications of the findings will be discussed, along with some limitations of the current study.

Chapter 2

The rise of cultured meat

Since the Dutch scientist Mark J. Post published his article announcing the possibility of producing meat in vitro (Post, 2012), a large number of studies have been carried out to analyze implications and consumer perceptions. Research has shown that the first impact is not positive. In Italy, a 2018's Ixè survey found a 75% unfavourability when it came to making a judgment about its impending market entry[1]. Another survey in three Chinese cities found that only 24.2% were inclined to accept this product and, after providing information about the technology and reporting its benefits, this acceptance rate jumped to 45.5% (Meng et al., 2020). Other studies in which respondents were informed a priori about the characteristics of the cultured meat reported good levels of willingness to try and confirmed the goodness of providing information. In this regard, two surveys carried out in 2013 in the Netherlands and England verified that the willingness to try stood at 52% and 65% respectively (Flycatcher) (The Guardian, 2013). A survey conducted in the U.S. 4 years later confirms a willingness to try of 65% (Wilks & Phillips, 2017).

However, not all literature records positive impressions about cultured meat. A study conducted by Hocquette et.al. (2015) revealed that educated consumers believe that "artificial meat will not necessarily reduce animal requirements" as well as finding some skepticism about its possible disruptive effect in reducing meat industry's carbon footprint. Indeed, in a survey in which consumers are faced with a hypothetical choice between beef, plant-based meat, and cultured meat at the same price, only 10.6% of respondents expressed a preference for the latter (Slade, 2018). Ultimately, consumer attitudes towards cultured meat are generally good, but not the performance in a hypothetical future market. Regarding Italy, in recent times only two studies measured willingness to try and obtained a percentage of positive respondents' answers of 54% and 78% respectively (Mancini & Antonioli, 2019) (Palmieri & Lupi, 2020).

Other papers proposed a qualitative type of investigation and provided guidelines for future research in the field. Underlying consumer rejection are paradigms of unnaturalness, playing god and messing with nature (Verbeke et al., 2015) (Bryant & Barnett, 2018) while underpinning a positive attitude are mainly the benefits of increased sustainability and ethical living (Bryant & Barnett, 2018) (Palmieri & Lupi, 2020).

[1] https://www.statista.com/statistics/945453/opinion-on-cultured-meat-in-italy/#statisticContainer

It is important to specify that the environmental benefits of consuming cultured meat are still under discussion and is not yet clear in which fields and in which entity may occur. Early research was quite optimistic, claiming that the production of cultured meat could reduce land use by 99%, water use by 96% and energy use by 45% compared to traditionally used breeding models (Tuomisto et al., 2011). Subsequent research, however, has adjusted the figure to reveal that the water and energy footprint is actually higher than previously thought (Tuomisto et al., 2014) and that in the case of poultry and pork, energy use is even higher while confirming lower greenhouse gas emissions and lower land usage. Regarding beef, the environmental benefits are confirmed although it is acknowledged that the energy that would be used is essentially the same as that required today (Mattick et al., 2015).

All studies agree on the identikit of the person who is most likely to have positive attitudes towards cultured meat: male, young, educated, liberal-minded and living in big cities whereas older people with conservative political views and less education seem to be more reluctant even when it comes to just tasting. Similar demographic findings were also found for GMO (Genetic Modified Organism) food and organic food (Magnusson & Hursti, 2002) (Canavari et.al., 2002). It is not surprising that vegetarians have shown a positive opinion of cultured meat in addition to plant-based one in various surveys (Slade, 2018) (Wilks & Phillips, 2017) but their willingness to try is lower than those who claim to be meat eaters. Last but not least, Christopher Bryant stated that in a Michael Sigriest's research they "found a significantly higher rate of acceptance when participants were given a non-technical description of cultured meat compared to a technical description due to a difference in perceived naturalness and evoked disgust" (Cited in Siegrist et al., 2018).

2.1 The effects of message framing

In contrast to the literature on cultured meat, the literature on message framing has a larger and older corpus of research, but whose conclusions are markedly mixed. Message framing refers to the way in which a piece of information about a certain topic is presented to people. Interestingly, consumer response to this information may vary as a function of message framing. Given the effect of message framing on consumer response, researchers, businesses and other players have turned their attention to it, adopting framing as a weapon and doing a lot of research on the subject. Cornelissen (2011) stated "When looking for message effectiveness, one of the most relevant issues to address is the one of choosing the right frame", confirming that message framing is

markedly important for businesses communication and marketing in particular, because is able to shape consumer behavior (Shiv et al, 1997).

The conventional beginning of the literature on this topic coincides with the formulation of the prospect theory by Kahneman and Tversky (1991), and from then on, in increasing measure, various studies followed. Levin (1998) conducted a qualitative study making transparency in the field of studies by defining the difference between negatively framed message and positively framed message. The former focuses on the negative consequences of not doing a proposed action while the latter focuses on the positive consequences of performing a proposed action. However, neither of these two types of framing has proven to be more effective than the other in shaping consumer perceptions and behavior. In some cases, one is more effective, at other times, the other one is. The discrepancy seems to lie in various variables at play, such as the context (e.g., preventing health issues, sustainability, ethical problems), the temporal and geographical distance of the consequences, the uncertainty of their occurrence, the language and the tone of voice used.

An example is provided by research carried out in the context of health-related issues, where negative framed messages seem to have more effect in encouraging healthy and responsible behavior in addiction to preventive behavior of sexually transmitted diseases and cancer (Ferguson & Gallagher, 2007) (Marchand & Filiatrault, 2002). However, there are exceptions in which positive framed messages are more effective (Gallagher & Updegraff, 2012). In another study concerning skin cancer, it was shown that if the message is about an action whose outcome is doubtful, a negatively framed message is more effective, but as soon as the outcome of the action is easy to predict, the two types of messages are equally effective (Block & Keller, 1995). These mixed results can be observed in several situations (Maheswaran & Meyers-Levy, 1990). If the variable "relevance" is present and is high, negative framing is the most functional but when the respondent is facing a health problem of low personal relevance, the situation is reversed revealing a greater incisiveness of the gain framed message (Meyers-Levy & Maheswaran, 2004).

Even and especially in other contexts, the results of positive and negative framed messages continue to be conflicting. If the construal level variable, that indicates how far away the consequences of a proposed action are, is considered, when the consequences are far away, positive framing is more effective whereas, on the contrary, if the consequences are close, negative framing seems more powerful (Chang et al, 2015). Chandy discovered that in new markets, the loss framed message was more functional, whereas in an established market, the gain framed message has the upper hand (Chandy et al, 2001).

2.2 The emotions' power

Emotions are mental and physiological states associated with psychological changes, internal or external, natural, or learned stimuli (Stangor & Walinga, 2014). Most of today's theories define emotions, or rather emotional experiences, as a multidimensional process (and not as a state), articulated in several components and with an evolving time course. This multidimensional structure differentiates emotions from other psychological phenomena (such as perceptions or thoughts) (Thompson, 1990).

Feelings can influence attitudes, judgments and so actions of individuals too. Even, in the scientific field, emotions are autonomous, paramount and have greater power to influence social behavior than rational cognitive thinking (Zajonc, 2000). Given the great potential of these, the researchers investigated how they are triggered, the various types that coexist and how they mediate actions and in which contexts, especially in customer journey situation: Just think of impulse buying, a clear example of how emotions lead to decisions that are not exactly rational.

We distinguish between emotions that have a positive valence and those that have a negative valence. They lead to different effects (Forgas, 2001). In addition, we have more specific emotions, both positive, such as happiness, pleasure and pride, and negative, such as anger, guilt and shame (Lerner & Keltner, 2000).

To complete the emotions' theoretical framework, a distinction must be made between anticipated and anticipatory emotions. Anticipated emotions are affective reactions that someone may imagine experiencing in the future when certain events have occurred; anticipatory emotions are emotions currently experienced due to something that could happen in the future (Baugartner, Pieters, & Bagozzi, 2010).

Activation of anticipated emotions is capable of directing future behavior (Baumeister et al, 2007) and thus to mediate attitudes, judgements and actions that could be, in the research context, considered as dependent variables. Two studies have shown how the elicitation of anticipated pride and anticipated regret, can influence some investment and bargain game responses (Lee et al, 2012) (Van Der Schalk et al, 2012). Duhachek et al. (2012) demonstrated how two emotions with the same negative valence (shame and guilt) can have a greater or lesser persuasive effect depending on the message framing used.

2.2.1 Emotions mediating environmentally friendly behavior

In marketing research concerning sustainable products and green advertising, the binomial between emotions and message framing mentioned above is one of the most investigated themes and it has been widely demonstrated that emotions, with few exceptions (Elgaaied, 2012) , are able to mediate pro-environmental behavior (Onwezen et al, 2014) and that certain negative or positive framed messages can trigger different affective reactions (Baek & Yoon, 2017) (Nabi et al, 2018). Even in the green context, the literature has not been unanimous about which message framing is the most effective. The primacy of positive framed message or of the counterpart, again, depends on external variables such as construal level theory. It has been observed that in the presence of a high level construal, positive framing works at best, while if one is called upon to make a decision that has consequences considered close and relevant to the respondent, negative framing works better (White et al, 2011). Two research studies have investigated, in the moment just before a consumer is called to make a decision about an eco-friendly purchase, which one between a positive and a negative ramed message was more effective and which emotions had the role of mediators. The results were completely opposite: in the first research, the negatively framed message proved to be more effective in influencing the purchase decision, and the mediating emotion turned out to be the anticipated shame, clearly one of negative valence (Amatulli et al., 2017), while in the second one the positively framed message prevailed in modeling consumer attitudes, and the emotion that mediated the relationship between the dependent and independent variable was one with positive valence: anticipated pride (Schneider et al, 2016).

Lastly, since what drives the consumption of cultured meat are environmental and ethical benefits, it is necessary to expose the literature on framing and feelings also in the field of ethics and more specifically in the field of animal rights.

In this regard, the most used and effective technique seems to arouse negative emotions to elicit prosocial behavior. This is true when it comes, for example, to donating money or goods for charitable activities (De Luca et al, 2015), or perhaps when it comes to enticing people to donate blood (Renner et al, 2013). When dealing with animals and their rights, the discussion remains essentially the same because the objective of the communication used is to provoke negative emotions such as guilt. What changes is the tone of voice. The organizations that are committed to the protection of animals and aim to raise awareness and convince people to become vegetarian or even vegan, use a very strong tone, the result of years of experience, to reach their goal. These, in general, turn the spotlight on animal cruelty, suffering and sentience, necessity, and exploitation in a very raw way showing without filters what happens in intensive farming and slaughterhouses,

with the aim of generating strong feelings of guilt in the recipient (Williams C. , 2012) (Fernandez, 2020). The arguments used to persuade the recipients of these messages are mainly two: the utilitarian ones, which are based on emphasizing animal welfare, reform and reduction and human self-interest; and the ideological ones, emphasizing animal rights and abolition (Freeman, 2014). In fact, one of the most widely used techniques in the field is to anthropomorphize animals and thus draw attention to their rights. Faced with a message that anthropomorphizes animals, meat consumers experience anticipatory guilt and a lower propensity to eat meat (Wang & Basso, 2019).

Chapter 3

Hypotheses formulation and conceptual model

In light of the information in the previous chapter, the research hypotheses will now be formulated. The hypotheses, and more generally the research, will have a marketing focus: the goal is to identify what type of communication might be used when this product will be on the market and will need to be promoted.

In terms of the type of communication to be used, the first element that will be addressed is the focus of the message. It is well known that the reasons why cultured meat is welcomed by consumers are the fact that it gives several advantages from an environmental and ethical point of view (Bryant & Barnett, 2018) (Palmieri & Lupi, 2020), so it is certainly sensible to investigate the effects of a communication based on these two arguments.

Research published in Meat Science (Furnols & Guerrero, 2014) indicates what the drivers of meat purchases are and then figure out what might be another useful focus to contrast with the first two. It's still too early to focus on marketing motivations like price and brand, moreover, the motivational driver regarding health has already been shown to be less effective than one focused on environmental benefits when consumers are asked to choose or not choose vegetarian menus (Ye & Mattila, 2021).

One focus that might be of interest to the topic is flavor and nutritional properties. In fact, flavor, along with price, is the primary driver of meat purchase, especially in older generations with greater purchasing power (Fromm, 2019). However, since the reasons for choosing an alternative to meat lie mainly in ethical and environmental reasons (Krizmanic, 1992), it is expected that communication based on these two focuses will generate better market responses.

Therefore, it is hypothesized:

H1a: A message with a focus on animal protection or environmental protection is more effective in generating high levels of intention to try cultured meat than a neutral focus on taste and nutritional properties.

H1b: A message with a focus on animal protection or environmental protection is more effective in generating high levels of purchase intention for cultured meat than a neutral focus on taste and nutritional properties.

In the previous chapter, it was seen that there is actually no specific framing that works for all situations. Positive framing works well in the presence of promotional messages (Lee & Liu, 2018), when the topic is of little relevance to the consumer (Maheswaran & Meyers-Levy, 1990), when there is a high construal level (Chang et al, 2015), or in areas of established markets (Chandy et al, 2001).

Negative framing works best in prevention messages, when the outcome of the action is doubtful (Block & Keller, 1995), when the topic is highly relevant to the respondent (Maheswaran & Meyers-Levy, 1990), when construal level is low (Chang et al, 2015), and in emerging markets (Chandy et al, 2001) like the cultured meat one.

In the area of pro-environmental communication, it has been observed that negative framed messages are more effective (Amatulli et al., 2017) (Patrick et al., 2009) (Li et al., 2021) and that a potential future loss is more relevant than a future gain (Hardisty & Weber, 2009). There is no shortage of research where instead, positive framed messages generate better results (Schneider et al, 2016) but are still present in lower numbers.

In the social domain, on the other hand, there is ample evidence that negative framing is more effective in generating prosocial behavior (Renner et al, 2013) (De Luca et al, 2015) and since one of the focuses of manipulative messages centers on animal welfare, this is a very important insight in view of hypothesis formulation.

Therefore, hypotheses about the topic will be:

H1c: A message with a negative framing generates higher levels of intention to try cultured meat than a positive framing.

H1d: A message with a negative framing generates higher levels of purchase intention cultured meat than a positive framing.

In the literature review, it was seen that emotions can play an important role in mediating certain behaviors (Bagozzi, 1998). Usually, negative emotions are elicited by negatively framed messages, and positive emotions by positively framed messages. Since there is no unequivocal judgment on the type of framing, three emotions were ultimately considered: two negative and one positive, among the most used in research on green communication and animal welfare. These are anticipated pride, anticipated shame and anticipated guilt.

Hence hypotheses about emotions can be divided in those in which emotions are the trigger:

H2a: Anticipated shame is positively correlated with intention to try

H2b: Anticipated guilt is positively correlated with intention to try

H2c: Anticipated pride is positively correlated with intention to try

H2d: Anticipated shame is positively correlated with purchase intention

H2e: Anticipated guilt is positively correlated with purchase intention

H2f: Anticipated pride is positively correlated with purchase intention

And those in which emotions are the mediators:

H3a: Anticipated shame mediates the relationship between framing and intention to try

H3b: Anticipated guilt mediates the relationship between framing and intention to try

H3c: Anticipated pride mediates the relationship between framing and intention to try

H3d: Anticipated shame mediates the relationship between framing and purchase intention

H3e: Anticipated guilt mediates the relationship between framing and purchase intention

H3f: Anticipated pride mediates the relationship between framing and purchase intention.

Finally, we need to make considerations about the effect of age on intention to try and purchase intention. It is reasonable that young people will have a more positive consideration of cultured meat than adults.

The reason for this phenomenon lies in several aspects. First, it is observed that as humans get older, they are less willing to accept changes in their lives (Westerhoff, 2008) and more specifically, also in a hypothetical purchase scenario, when aging individuals are asked to choose between a contemporary and a traditional product they are more likely to get the latter (Peluso et al., 2020). In addiction, it has been observed that young people identify happiness more in exceptional positive events while the elderly associate greater happiness to ordinary events, pleasant and full of peacefulness (Bhattacharjee & Mogilner, 2014) (Mogilner, 2011).

This is just one of the differences in reasoning present among individuals of different ages. Carstensen (1995) has formulated the Socioemotional Selectivity Theory, which aims to explain the shift of individual goals and behaviors with age. This theory states that humans also tend to behave and make choices based on the time they perceive is left in a kind of future time perspective, so if for younger people future investments and objectives linked to the acquisition of knowledge, professional planning, and the development of new social networks are more important, for the elderly, psychological well-being and goals that give positive emotions in the short term are more

important, as is dwelling on a few but strong interpersonal relationships. In addition, these are less likely to expand their social circles as they are less likely to bring new possibilities and knowledge. These assumptions could be reflected by giving different outcomes in relation to the independent variable "focus" of this research. In fact, remembering that the focus of the manipulative research message is on animal protection, the environment and the taste and nutritional properties of cultured meat, older people are less likely to be concerned about climate change and less likely to behave sustainably than youngsters (Coldiretti-Ixè, 2020) (McKinsey & Company, 2020) (Gallup, 2018) probably due to a reduced future time perspective too.

In addition, it has been shown that the elderly, in accordance with Socioemotional Selectivity Theory, make choices whose results are seen in the short term (Williams & Drolet, 2005), based primarily on emotions instead of utilitarianism (Mikels, Shuster, & Thai, 2015), and the reasoning done a priori before a decision is little articulated and more immediate (Mata, Josef, & Lemaire, 2015).

This suggests that, among the three aforementioned focuses, the one based on animal protection could be more effective than the others among the oldest because the thought of animal protection could have a more emotional appeal than the others and because the company of a pet, already has an important role in alleviating loneliness among the elderly (Stanley et al., 2014). Compared to a choice made for the environment, the beneficial results could be seen in the short term and are of immediate understanding.

Ultimately, often when we think of animals, we detect some cuteness in them. The cuteness is able to activate in human instinctive feelings of protection and caregiving, a kind of parental brain (Kringelbach et al, 2016). This sort of caring feelings might be stronger in older individuals who have already had the opportunity to be parents and care for other animals and people.

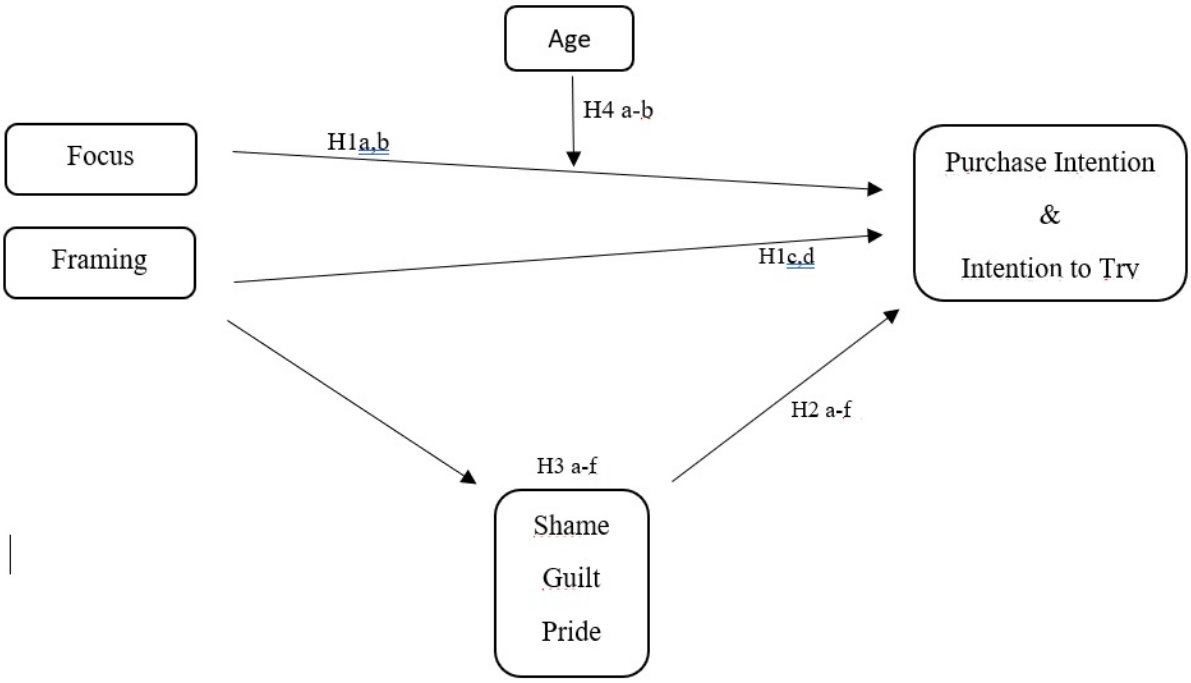
This completes the framework to be able to formulate the last two hypotheses:

H4a: Among older respondents, a message focused on animal protection is more effective in generating high levels of intention to try than the other two focuses

H4b: Among older respondents, a message focused on animal protection is more effective in generating high levels of purchase intention than the other two focuses

To summarize, here in the figure 1 is the conceptual framework of the hypotheses.

Figure 1| Research's conceptual model



Chapter 4

Methods, analysis and findings

The goal of this chapter is to summarize the methodology employed to test the hypotheses and respond to the research questions. To this end, the first thing to do was to collect consumers' opinions on the topic of cultured meat. To do this, the tool used was a questionnaire administered exclusively online. The reason why the questionnaire was distributed purely electronically is that the response collection period coincides with March, April and May 2021, a time in which anti-Covid regulations were still in force, and that made difficult to hand out paper questionnaires in person.

The survey consisted of four sections: In the first section, respondents were briefed about what cultured meat was and what could be the reasons about its possible rise in the next years, then, they were randomly shown a manipulative message from the six available.

The central message employed in the research survey was developed in six versions that differently combined message frame (positive vs. negative) and message focus (animal protection, environmental protection, neutral). The neutral version stated that cultured meat has the same nutritional properties and taste as classic meat. The version with a focus on environmental protection stated that consuming cultured meat would reduce environmental damage. The one with a focus on animal protection stated that consuming cultured meat would save several lives of livestock. Each of these three messages exhibited either a positive or a negative frame. The positively framed message puts the consumer in front of a hypothetical choice of buying the cultured meat where he/she buys it thus having positive implications. The negatively framed message puts the consumer in front of a hypothetical choice to buy cultured meat where he/she does not buy it thus causing negative consequences.

In the following Table 1 are explained the messages used in the questionnaire.

Table 1|Questionnaire's manipulative messages

	Positive Framing	Negative Framing
Environment protection focus	Cultured meat is a lab-created edible meat that could be commercially available in about 10 years, to meet the growing global need for protein foods. Because it is artificially produced, this meat is primarily intended to significantly reduce greenhouse gas emissions and the consumption of natural resources by intensive livestock farming. **If you decide to buy it and consume it regularly, you could make an active contribution to environmental protection**. Imagine now that you behave as described in the bold message you read above; that is, that you find yourself in a possible purchasing situation in which you choose to regularly buy and consume cultured meat by contributing to the protection of the environment, then, answer the following questions regarding the emotional state you would feel in such a situation.	Cultured meat is a lab-created edible meat that could be commercially available in about 10 years, to meet the growing global need for protein foods. Because it is artificially created, this meat primarily serves to save the lives of the many animals that are currently being horribly killed in slaughterhouses. **If you decide to buy it and consume it regularly, you could contribute to the protection of many animals.** Imagine now to behave as described in the bold message you read above; that is, to find yourself in a possible purchasing situation in which you choose to buy and consume regularly cultured meat helping to save the lives of many animals, then, answer the following questions regarding the emotional state you would feel in such a situation.
Animal protection focus	Cultured meat is a lab-created edible meat that could be commercially available in about 10 years, to meet the growing global need for protein foods. Because it is artificially created, this meat primarily serves to save the lives of the many animals that are currently being horribly killed in slaughterhouses. **If you decide to buy it and consume it regularly, you could contribute to the protection of many animals.** Imagine now to behave as described in the bold message you read above; that is, to find yourself in a possible purchasing situation in which you choose to buy and consume regularly cultured meat helping to save the lives of many animals, then, answer the following questions regarding the emotional state you would feel in such a situation.	Cultured meat is a lab-created edible meat that could be commercially available in about 10 years, to meet the growing global need for protein foods. Because it is artificially created, this meat is primarily intended to save the lives of the many animals that are currently atrociously killed in slaughterhouses. **If you decide not to buy it and not to consume it regularly, you could contribute to the killing of many animals**. Imagine now to behave as described in the message in bold that you have read above; that is to say to find yourself in a situation of possible purchase in which you choose not to buy and not to consume regularly the cultured meat contributing to the killing of so many animals, then, answer the following questions regarding the emotional state you would feel in such a situation.
Neutral focus	Cultured meat is a laboratory-created edible meat that could be commercially available in about 10 years to meet the growing global need for protein foods. **If you decide to buy it and consume it regularly, you will find that it is similar to conventional meat in taste, texture and nutritional properties**. Imagine now that you are in the same situation as described in the bold message above; that is, that you are in a possible purchasing situation where you choose to buy and regularly consume cultured meat and find that it is similar to regular meat, then, answer the following questions about the emotional state you would feel in such a situation.	Cultured meat is a laboratory-created edible meat that could be commercially available in about 10 years to meet the growing global need for protein foods. **If you decide not to buy it and not to consume it regularly, you will miss the chance to see that it is quite similar to traditional meat in taste, texture and nutritional properties.** Imagine now that you behave as described in the bold message above; that is, that you find yourself in a situation of possible purchase where you choose not to buy and not to consume cultured meat on a regular basis and miss the chance to see how similar it is to regular meat, then, answer the following questions regarding the emotional state you would feel in such a situation.

Given the high number of manipulative messages, before the distribution of the questionnaires, it had been set out to collect at least 400 valid responses.

Specifically, the survey asked the participants to identify themselves with a scenario of purchasing cultured meat presented through one of six messages. The validity of the procedure was

demonstrated in a previous research study where it was shown that hypothetical choices about food are matched in real life (Chang et. al., 2009).

In the second part of the survey, the presence and extent of mediating emotions was measured which, as indicated in the previous chapter, were anticipated guilt and anticipated shame as emotions with negative valence, and anticipated pride as positive one. One to seven scored multi-item scales were all displayed in random order and are available in the appendix (Appendix 1).

In the third part, there are one to seven scored scales taken from other famous research and adapted to the situation to detect the willingness to try cultured meat and willingness to buy (Appendix 2).

Finally, in the fourth and final part, sociodemographic data of the participants were collected, including age, level of education, municipality and whether they belonged to vegetarian or vegan categories, certainly another variable that could strongly influence the responses (Appendix 3).

In the table 2 below, the scales are indicated with their items and the research from which they were extracted.

Table 2| Scales employed

Constructs	Items	Source
Anticipated shame	• I feel embarrassed • I feel ashamed • I feel humiliated	Adapted from: Han, Duhachek & Agrawal (2014)
Anticipated guilt	• I feel guilty • I feel culpable • I feel remorseful	Adapted from: Han, Duhachek & Agrawal (2014)
Anticipated pride	• I feel accomplished • I feel successful • I feel like I am achieving • I feel fulfilled • I feel like I have self-worth • I feel confident • I feel productive	Adapted from: Tracy and Robins (2007)
Willingness to Try	• I will do anything to try the cultured meat. • If somebody gives me this food, I will try it. • Considering the provided info, I am very interested in try it	Adapted from: Aqueveque (2015)
Purchase Intention	• It is likely that I will buy cultured meat • In the future I would buy cultured meat • It is possible that I will buy cultured meat	Adapted from: Ko et al. (2005)

4.1 Questionnaire and sample composition

The questionnaire was administered to a sample of Italian consumers. This sample can be considered non-random because, for various logistical and economic reasons, it was not possible to reach a representative sample. However, in the field of research on cultured meat, convenience samples are widely used, and are now part of a sort of standard procedure (J.F. Hocquette et.al., 2015) (Mancini & Antonioli, 2019) (Siegrist et al., 2018).

Responses from respondents under 18 years old for legal reasons, and over 70 years old were excluded.

The answers of older consumers were not taken into account because, despite being of greater quality (Struminskaya et al, 2015), in recent times, the Italian national institute of statistics (ISTAT) (ISTAT, 2019), found that the proportion of Italians who routinely use the Internet gradually decays with age. 88.6% of the aged over 74 years have not accessed the internet in the last three months, and about 87% have never used it. In addition, other discriminants at play are education level and geographic area. The same ISTAT report, showed that elderly people who access the internet regularly, are much more educated than other coetaneous less familiar with technology and live in big cities. Recruiting them would have meant misrepresenting the attitudes of consumers belonging to that age group. Fortunately, no response was received from those over that age.

In addition, it was decided to eliminate questionnaires with at least one incomplete field and those in which it was apparent that proper care had not been employed.

Basically, the sample was started by simply sending the questionnaire to family, friends and acquaintances who then proceeded to send it to their contacts. This procedure is ascribed to snowball sampling. This type of sample, however, is not representative of the population, and the results obtained from it are biased; therefore, intervention was made using Prolific.co (https://www.prolific.co/).

Prolific.co is an online platform that allows you to recruit survey participants for a small fee. The great advantage of using this platform is that you can indicate in advance the demographic characteristics of the people to whom the questionnaire will be administered. This has made it possible to correct the composition of the sample on the fly making it more similar to the composition of the Italian population.

Assuming the considerations made previously on the under-aged and over-70s, at the anagraphic level, the remaining composition of the population can be summarized as follows: one third of people under 35, another third from 35 to 50 and another third over 50 (Population Pyramids of the World from 1950 to 2100, 2021). Therefore, after receiving the first responses, depending on the anagraphic composition of these, responses have been collected from users whose age was lacking in the sample.

This reasoning was also used for other variables in play. For example, after collecting the initial responses, it was noted that among those in the youngest age group, there were 80% of college graduates. Given that the level of education is a variable capable of influencing the dependent variable (Meng et al., 2020) and given that the percentage of graduates in that age group in Italy is around 25% (ISTAT, 2019), we proceeded to collect responses from young non-graduates on the prolific platform. With this procedure, the biased effect that could have been created by snowballing data collection was mitigated.

The total number of valid responses collected is 405. Of these 405 respondents, we included 182 women, who thus make up 44.9% of the sample, and 220 men, who represent 54.3% of the sample, plus three people who did not identify themselves with any gender group.

Regarding age, the average age of the respondents was 40.6, ranging from a minimum of 19 years to a maximum of 69. The balance between the age groups that was set to be respected in the preliminary phase was fairly well respected as the age group from 19 to 34 years old represents 35.06% of the sample (n=142), that from 35 to 50 years old represents 33.33% (n=135), and finally the age group representing those older than 50 years old makes up 31.6% of the sample (n=128) (Appendix 4).

Of the 405 responses, 198 are from questionnaires in which positive framing is used, the other 207, are from questionnaires that used negative framing. Regarding the focus of manipulative messages, we include 163 survey forms with a focus on environmental protection, 118 with a neutral focus on nutritional qualities and taste, and finally 124 with a specific concern for animal protection. In Appendix 5, cross tabulated data on the frequencies of the two categorical variables are shown.

A frequency analysis (Appendix 6) regarding education level, municipality of residence, and the presence of vegetarians and/or vegans yielded the following results: Those who declared to have the middle school license as the highest level of education, make up 3.2% of the sample (n=13), those who have completed high school 60.7% (n=246), graduates are 33.6% (n=136) and finally, those who have a doctorate 2.5% (n=10). Those who said they were vegetarian and/or vegan numbered 34 and made up 8.4% of the sample.

Regarding data on municipalities of residence, an arbitrary division was made into 4 ranges according to their population. The first band refers to very small municipalities (< 20000 inhabitants), the second to medium-small ones (between 20000 and 75000 inhabitants), the third to medium-large ones (between 75000 and 150000 inhabitants) and the fourth represents those who live in large cities (> 150000 inhabitants). 49.6% (n=201) of the sample, resided in a small municipality in the first tier, 11.6% (n=47) in a municipality in the second tier, 20.5% (n=83) in the third tier, and the remaining 18.3% (n=74) in a large municipality in the fourth tier.

4.2 Analysis

4.2.1 Reliability analysis

Before proceeding to the main analysis, it is advisable to perform a reliability analysis for the scales employed. For a reliability analysis of the scales used in the study, the Cronbach alpha is used. The value of Cronbach Alpha ranges from 0 to 1 and the closer it is to 1, the more reliable the scale is considered to be (Leontitsis & Pagge, 2007).

Starting with the multi-item scales designed to measure mediators, we record Cronbach's alpha values of 0.932, 0.966 and 0.964 for anticipated shame, anticipated guilt and anticipated pride, respectively (Appendix 7). In addition, in none of these scales there were items that, once eliminated, would increase reliability; therefore, we proceeded to create a new variable which would unify the values of the items by averaging them.

The same procedure was performed for all other multi-item scales, and again, the recorded Cronbach values showed excellent reliability for each of them, and no items were eliminated. Specifically, the Cronbach alphas recorded for the other scales were 0.902 for intention to try and 0.961 for purchase intention (Appendix 8).

4.2.2 Relationship analysis

To get a preliminary idea about the hypotheses, a correlation analysis will now be done between the variables involved. Correlation analysis is generally done to see if there is in fact a correlation between two variables (Archdeacon, 1994). If there is a correlation between two variables that are expected to be dependent on each other, the right track has been taken. Two variables that are not correlated with each other cannot be dependent. Conversely, if two variables are correlated it does not mean they are dependent, so if so, further analysis is required.

There are several coefficients, such as Pearson's *r*, that allow us to calculate correlation and they vary depending on the characteristics of the variables. Since the independent variables of the study are categorical and not dichotomous (focus has three scenarios), the analyses that will employ focus and framing will be the eta square one while for the ordinal variables, i.e., mediators and dependent variables, Pearson correlation will be employed.

The first relationship in which a possible link will be sought is that between independent variable framing and mediators that consists of the three emotions. The analysis on the eta square has brought the results present in the Table 3.

Table 3| ANOVA analysis between framing and emotions

Tested relationship	**Degree of Freedom**	**F**	**Eta (η)**	**Eta Squared**	**p value**
Framing → Shame	404	112,023	0,466	0,218	0,000
Framing → Guilt	404	285,121	0,644	0,414	0,000
Framing → Pride	404	197,564	0,574	0,329	0,000

The Table 3 shows that all relationships are significant (p values = 0,000 < α = 0,05) and also the eta squared values are high (0,218, 0,414, 0,329). This leads us to conclude that there is a strong correlation between the variables and that we are well on our way to being able to test the H3 family hypothesis.

The correlation between mediators and dependent variables, if verified, could be a second step in being able to demonstrate an existence of mediation. To proceed, the coefficient *r* will be computed. Below in the Table 4 are the results:

Table 4| Correlation matrix between emotions and market responses

Variable	Shame	Guilt	Pride	Intention to Try	Purchase Intention
Shame	1,00	-	-	-	-
Guilt	0,784**	1,00	-	-	-
Pride	-0,522**	-0,602**	1,00	-	-
Intention to Try	-0,028	0,075	0,078	1,00	-
Purchase Intention	0,020	0,093*	0,095*	0,886**	1,00

** = significance at level $\alpha/2 = 0.025$ (two tailed); * = significance at level $\alpha = 0,1$

As expected, there is a significant correlation between the mediators, particularly positive between anticipated shame and anticipated guilt and negative between anticipated pride and the two negative emotions (p values > 0,025; $\alpha/2 = 0,025$) Similarly, we note a positive and significant correlation between the dependent variables (p value > 0,025; $\alpha/2 = 0,025$).

Moreover, we can see like the coefficients, speak about weak relationships between the emotions and the market responses, plus, no relationship is significant (p values > 0,025; $\alpha/2 = 0,025$). This might suggest that a possible problem in the subsequent mediation analysis as it would seem that only the relationships between purchase intention and anticipated guilt and purchase intention and anticipated pride can reach significance (p value < 0,1).

Considering these results, hypotheses H2a, H2b, H2c, H2d, H2e and H2f are not supported.

The relationship analysis will now be completed by probing the relations between independent variables, in this case Focus and Framing, and dependent variables, that are intention to try and purchase intention.

Table 5| ANOVA analysis between independent and dependent variables

Tested relationship	Degree of Freedom	F	Eta (η)	Eta Squared	p value
Focus → Intention to Try	404	2,425	0,109	0,012	0,09
Focus → Purchase Intention	404	1,744	0,093	0,09	0,176
Framing → Intention to Try	404	0,112	0,017	0,000	0,738
Framing → Purchase Intention	404	0,390	0,032	0,001	0,533

The results in Table 5 show that, again, there is no significant correlation between the variables (p values > 0,05; $\alpha = 0,05$). The only relationship that there might be slightly significant is between focus and intention to try (p value < 0,1) In the next chapter about inference, it will be seen how these variables interact.

4.2.3 Inferential analysis

Inferential statistics is the branch of statistics that studies partial and sample surveys of a population. It is also called statistical inference. It deals with analyzing data obtained from a sample of the population to estimate a statistical phenomenon over the entire reference population (Azzalini, 2001). In this case, the variables capable of influencing market responses (intention to try, purchase intention) will be investigated to answer the research questions.

In the following step, thanks to the statistical analysis of variance, i.e. ANOVA, it was tested the significance of the resulting difference between the mean values of variables as observed across the different groups of respondents assigned to the experimental conditions. Since there are two independent variables and one has more than two categories, in particular the analysis employed will be a Two-Way ANOVA.

The first relationship that will be tested is that between the focus used and framing with intention to try. In the variables involved, no outliers were found, the assumption of homogeneity of variance is respected (Appendix 9) and moreover, since the sample is very large, despite not having a Shapiro Wilk test that shows that the dependent variable is not normally distributed (Appendix 10) we can say that the assumptions are respected. Below are the results of the Two-Way ANOVA having intention to try as the dependent variable and Sex, Age, Education, City and Veg as covariates.

Table 6|Two-Way Anova of Intention to Try

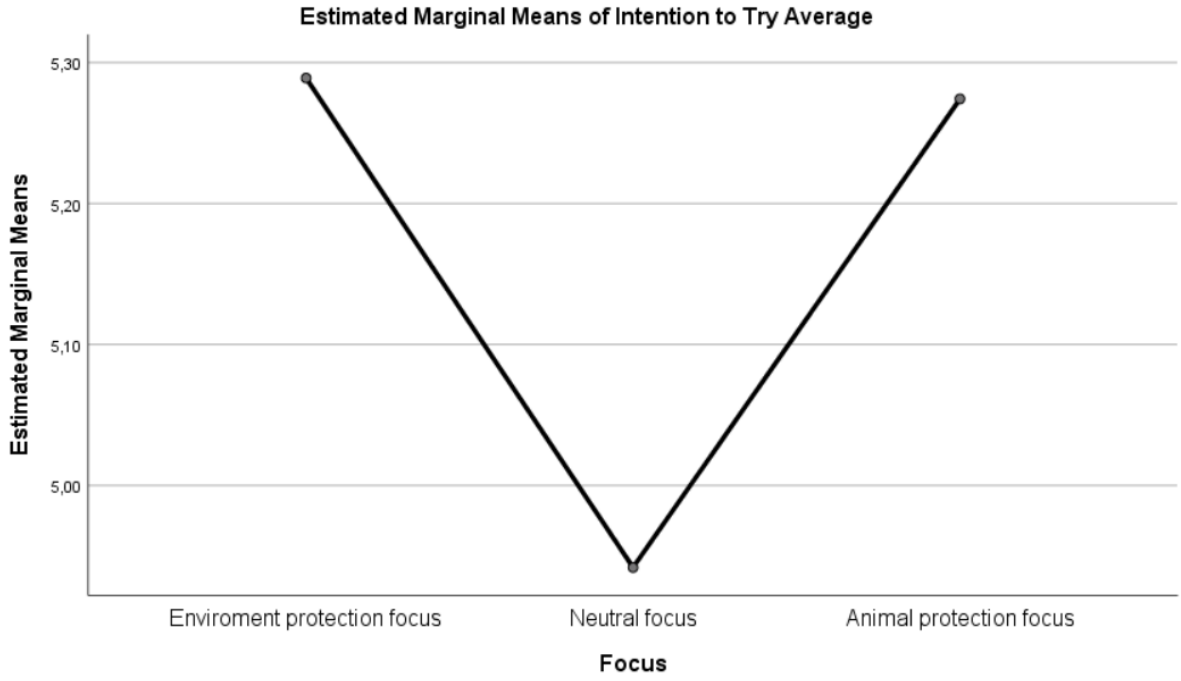
Dependent variable: Intention to Try

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Corrected Model	67,271[a]	10	6,727	3,488	0,000
Intercept	339,482	1	339,482	176,002	0,000
Sex	0,332	1	0,332	0,172	0,679
Age	46,195	1	46,195	23,950	0,000
Education	0,238	1	0,238	0,123	0,725
City	1,118	1	1,118	0,580	0,447
Veg	0,402	1	0,402	0.209	0,648
Focus	9,990	2	4,995	2,590	0,076
Framing	0,033	1	0,033	0,017	0,896
Focus*Framing	3,099	2	1,550	0,803	0,449
Error	759,967	394	1,929		
Total	11699,333	405			
Corrected Total	827,238	404			

The results summarized in Table 6 show that the framing variable failed to affect the dependent variable in a significant way. Therefore, hypothesis H1c is rejected.

The focus variable, instead, has a marginally significant effect on intention to try (0,1 > p value > 0,05). Looking at the means in the figure 2, we find that the focus on environmental protection and animal protection is more effective than the focus on taste and nutritional properties in influencing the intention to try. We can therefore accept hypothesis H1a.

Figure 2|Marginal means of Intention to Try



Among the covariates we include a significant effect of age that will be analyzed later.

The same analysis will come carried out now for the dependent variable purchase intention. Also in this case, the assumptions of the ANOVA are respected (Appendix 11, Appendix 12).

Table 7|Two way Anova of Purchase Intention

Dependent variable: Purchase Intention

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Corrected Model	89,189[a]	10	8,919	3,621	0,000
Intercept	247,672	1	247,672	100,551	0,000
Sex	2,119	1	2,119	0,860	0,354
Age	53,375	1	53,375	21,669	0,000
Education	4,564	1	4,564	1,853	0,174
City	3,603	1	3,603	1,463	0,227
Veg	0,955	1	0,955	0.388	0,534
Focus	10,387	2	5,194	2,109	0,123
Framing	0,092	1	0,092	0,037	0,847
Focus*Framing	3,660	2	1,830	0,743	0,476
Error	970,485	394	2,463		
Total	9585,922	405			
Corrected Total	1059,674	404			

In this case, neither Focus nor Framing have a statistically significant effect on purchase intention (p values > 0,05; $\alpha = 0,05$). We must therefore reject the H1b and H1d hypotheses and accept the null hypotheses H0.

In both Two-Way ANOVA analyses, age stands out among the covariates as having a significant effect on intention to try and purchase intention. To investigate the nature of the relationship, a correlation analysis will be performed below.

Table 8|Correlation matrix between independent variables and age

Variable	Age	Intention to Try	Purchase Intention
Age	1,00	-	-
Intention to Try	-0,250*	1,00	-
Purchase Intention	-0,245*	0,886*	1,00

* = significance at level $\alpha/2$=0,025 (two tailed)

The correlation table 8, reveals that as age decreases, the inclination of the consumer to try and buy cultured meat tends to increase.

4.2.4 Effect of focus on advanced age respondents

To test now the hypothesis about the greater effectiveness of animal focus for the more advanced age group, an analysis will be made by dividing the responses into three groups: a first of 33% of younger respondents, another 33% intermediate and finally the third group of interest composed of the responses of more senior participants.

The frequency table (Appendix 13) shows us that the age limits will be 19-33, 34-49 and 50-69. Each time an age group is examined, the other 2 will be excluded from the analysis, thus performing a Two-Way ANOVA taking into account only the responses corresponding to a given age group.

Below is a Two-Way ANOVA performed taking into account only the oldest age group.

Table 9|Two way ANOVA of Intention to Try for older respondents (50-69 years old)

Dependent variable: Intention to Try

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Corrected Model	37,703[a]	9	3,770	1,656	0,099
Intercept	20,529	1	20,529	9,015	0,003
Sex	1,671	1	1,671	0,734	0,393
Education	1,771	1	1,771	0,778	0,380
City	12,601	1	12,601	5,534	0,020
Veg	3,238	1	3,238	1,422	0,235
Focus	20,840	2	10,420	4,576	0,012
Framing	1,771	1	1,771	0,778	0,380
Focus*Framing	3,081	2	1,540	0,676	0,510
Error	277,813	123	2,258		
Total	3281,565	133			
Corrected Total	315,516	132			

Table 10| Two way ANOVA of Purchase Intention for older respondents (50-69 years old)

Dependent variable: Purchase Intention

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Corrected Model	46.921[a]	9	5,213	1,917	0,055
Intercept	42,264	1	42,264	15,540	0,000
Sex	0,151	1	0,151	0,056	0,814
Education	5.491	1	5,491	2,019	0,158
City	8,569	1	8,569	3,151	0,078
Veg	7,583	1	7,583	2,788	0,098
Focus	23,770	2	11.885	4,370	0,015
Framing	2,487	1	2,487	0,914	0,341
Focus*Framing	8,724	2	4,362	1,604	0,205
Error	334,517	123	2,720		
Total	2576,518	133			
Corrected Total	381,438	132			

As can be seen, the focus for this age group has a significant effect on these respondents' purchase intention and intention to try. It is necessary, therefore, to see also the values of the means recorded for those variables.

Figure 3| Marginal means of Intention to Try for older respondents (50-69 years old)

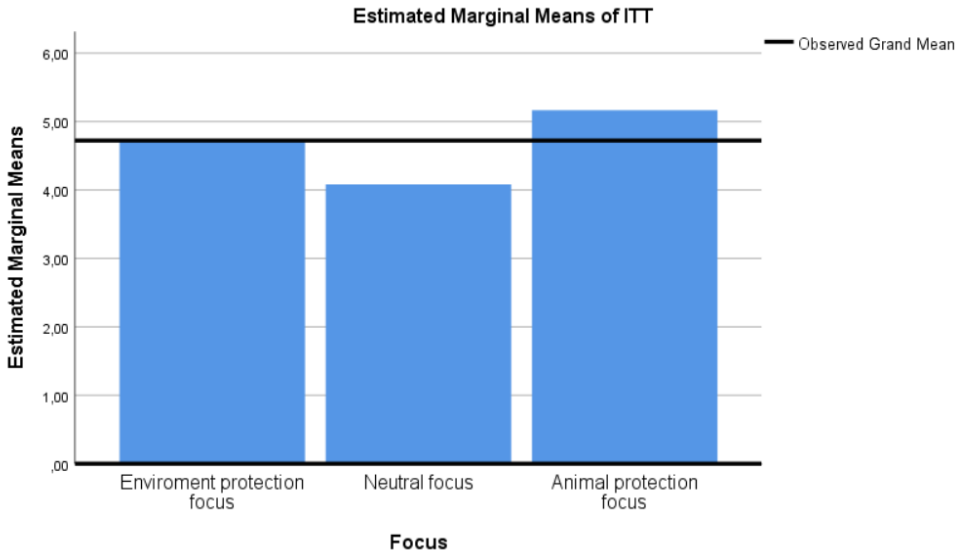
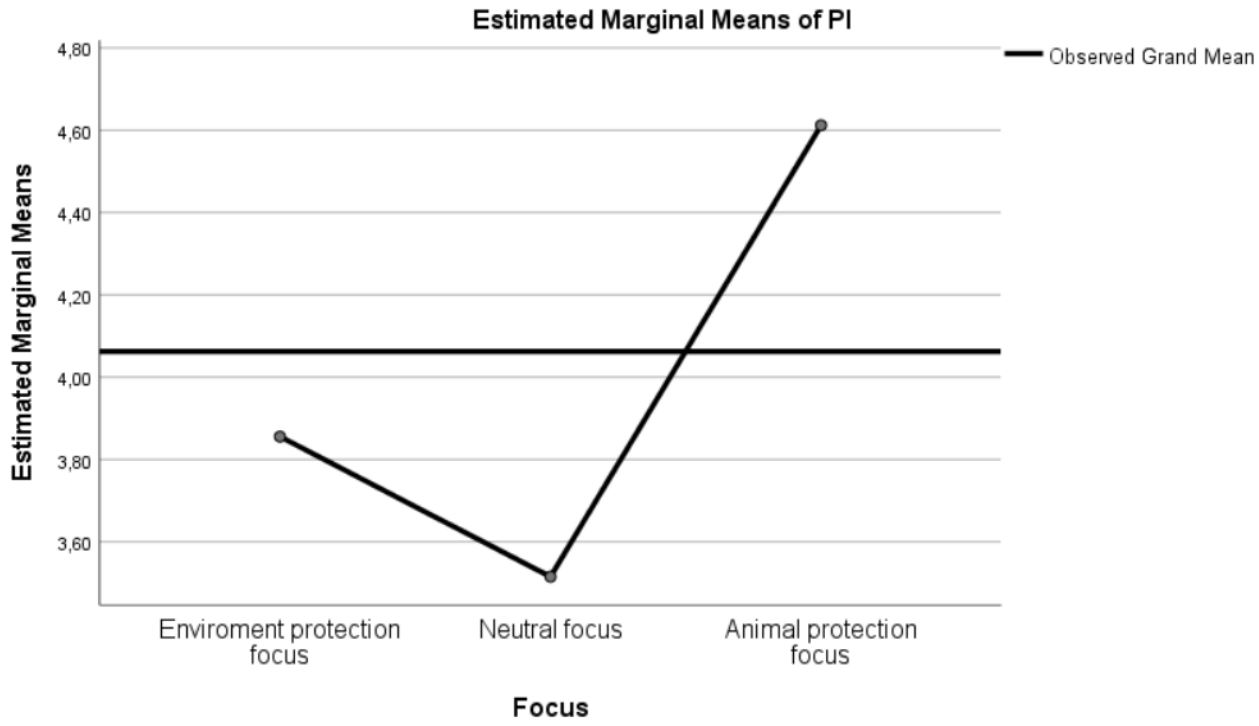


Figure 4|Marginal means of Purchase Intention for older respondents (50-69 years old)



The graph shows that, in fact, for the older age group, the focus on animals is effective in generating higher levels of intention to try and purchase intention.

To get a final confirmation, a comparison will be made on the means to see if their discrepancies are significant.

Table 11|Intention to Try means comparison for variable focus and for older respondents (50-69 years old)

Reference Focus	Comparison Focus	Mean Difference	Significance	Lower Bound (95% confidence interval)	Upper Bound (95% confidence interval)
Environment Protection Focus	Neutral Focus	0,40867	0,222	-0,2501	1,0674
	Animal Protection Focus	-0,41321	0,184	-1,0255	0,1991
Neutral Focus	Environment Protection Focus	-0,40867	0,222	-1,0674	0,2501
	Animal Protection Focus	-0,82188	0,016	-1,4893	-0,1544
Animal Protection Focus	Environment Protection Focus	0,41321	0,184	-0,1991	1,0255
	Neutral Focus	0,82188	0,016	0,1544	1,4893

Independent variable: Intention to Try

Table 12|Purchase Intention means comparison for focus variable and for older respondents

Reference Focus	Comparison Focus	Mean Difference	Significance	Lower Bound (95% confidence interval)	Upper Bound (95% confidence interval)
Environment Protection Focus	Neutral Focus	0,0892	0,807	-0,6310	0,8093
	Animal protection Focus	-0,7547	0,027	-1,4240	-0,0853
Neutral Focus	Environment Protection Focus	-0,0892	0,807	-0,8093	0,6310
	Animal Protection Focus	-0,8438	0,024	-1,5735	-0,1142
Animal Protection Focus	Environment Protection Focus	0,7547	0,027	0,0853	1,4240
	Neutral Focus	0,8438	0,024	0,1142	1,5735

Independent variable: Purchase Intention

The post hoc test on averages, reveals that we can accept the hypothesis H4b, therefore, in the older age group, a focus centered on animal protection is capable of generating higher levels of purchase intention than the other two focuses would be able to.

The same thing, unfortunately, is not possible in the case in which the dependent variable in examination is the intention to try. The significance value connected to the analysis of the difference between the means generated by the environmental and animal friendly focuses is not significant (p value > 0,05; $\alpha = 0,05$). Therefore, the hypothesis H4a must be rejected.

4.2.5 Mediation analysis

It is the turn to investigate whether feelings have a mediating effect between framing and dependent variables in order to best answer the hypotheses. The emotions we will account for in the analysis are anticipated guilt, anticipated shame and anticipated pride.

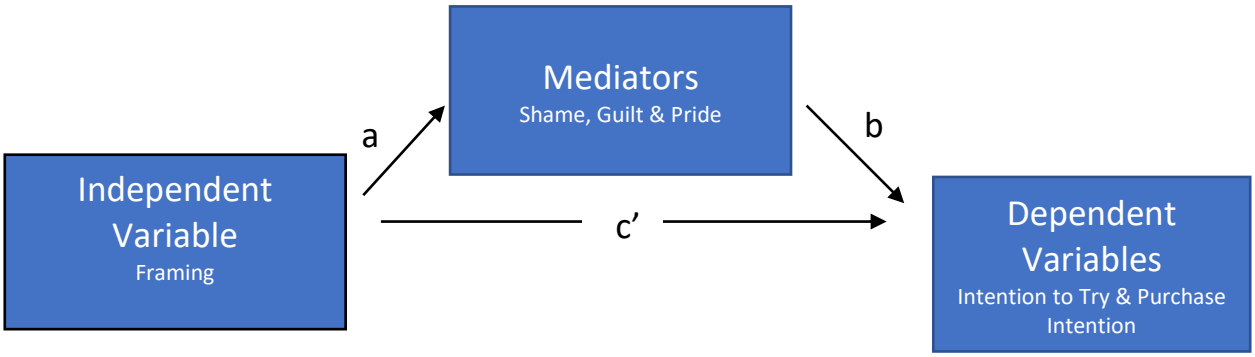
Mediation analysis aims to detect and understand the underlying influence that address a relationship between a dependent and independent variable, caused by a third hypothetical variable called mediator (Hayes, 2014). Since when a mediation analysis is being done, a regression

analysis is being run, the assumptions of the regression will be checked, and only if these are met, correct result could be gotten.

The first thing it will verify is whether the independent variables are normally distributed. Regarding this assumption for the dependent variables, we have already overcome this hurdle during the preliminary phase of the ANOVA analysis. The results (Appendix 14) show us that both Kolmogorov Smirnov and Shapiro Wilk tests come back positive, however, in this case is not a problem because bootstrapping does not pose a restriction for variables' normality (Preacher & Hayes, 2014).

The second test aims to prove the heteroscedasticity and linearity of the data. In the scatterplot performed (Appendix 15), is it possible to see that the assumptions are respected. In addition, there are no outliers and the independence of observations is guaranteed by the mode of data collection. Therefore, the assumptions are all respected and it is possible to proceed to the mediation analysis.

The process model that will be used in the analysis will be number 4, which is one that relates one independent variable, one mediator, and one dependent variable at a time. Being the number of independent variables one, the number of mediators 3 and the number of dependent variables 2, the test with this model will be repeated 6 times.



Here is the Table 13 with the results including the coefficients of mediation.

Table 13| Mediation analysis outcome

X (independent variable)	**M** (mediator)	**Y** (independent variable)	**a** (X → M)	**b** (M → Y)	**c'** (X → Y)	**Indirect effect**	**Indirect effect's significance**
Framing	Shame	Intention to Try	1,5373*	-0,0379	0,0387	-0,0582	Not Significant
Framing	Shame	Purchase Intention	1,5373*	0,0203	-0,1096	0,0312	Not Significant
Framing	Guilt	Intention to Try	2,5591*	0,0808*	-0,2263	0,2067	Not Significant
Framing	Guilt	Purchase Intention	2,5591*	0,1292*	-0,4091*	0,3306	Significant
Framing	Pride	Intention to Try	-1,8531*	0,0629	0,0970	0,1165	Not Significant
Framing	Pride	Purchase Intention	-1,8531*	0,0795	0,0689	0,1473	Not Significant

* = significance at level $\alpha/2$=0,05 ** = significance at level α=0,10

From the results, it can be seen that five out of six mediating relationships are not significant since the value zero was comprised in the bootstraps' confidence interval (Appendix 16). The only relationship that is significant is the one in which Framing is the independent variable, anticipated guilt sentiment is the mediator, and purchase intention is the dependent variable. The coefficient "a" of the report is very high (a=2.5591), a sign that the manipulative message, when a negative framing was used, was capable of generating high levels of guilt. The guilt feeling was then able to induce, in the hypothetical purchase situation proposed in the questionnaire, high intention of purchase.

In agreement with the data collected (Appendix 16), we can conclude that a 44,69% proportion of total effect, operates through the mediation on the dependent variable.

Among the hypotheses of mediation therefore, we accept only the H3e while the rest will be all rejected.

In the following table 14, all the hypotheses and their results will be proposed again

Table 14|Outcome of the hypotheses of the study

Hypothesis	
H1a	Accepted
H1b	Rejected
H1c	Rejected
H1d	Rejected
H2a	Rejected
H2b	Rejected

Hypothesis	
H2c	Rejected
H2d	Rejected
H2e	Rejected
H2f	Rejected
H3a	Rejected
H3b	Rejected

Hypothesis	
H3c	Rejected
H3d	Rejected
H3e	Accepted
H3f	Rejected
H4a	Rejected
H4b	Accepted

Chapter 5

Discussion

This study investigated what would be the best type of communication to use to promote cultured meat by considering two different types of framing and using three distinct focuses. It also sought to understand which message combinations were most effective for different age groups of the audience. Previous literature identified what might be the best drivers of acceptance of cultured meat through qualitative research (Palmieri & Lupi, 2020) (Bryant & Barnett, 2018) and these turned out to be the positive effects at an ethical and environmental level, however, a true comparison of the effectiveness of different messages in a quantitative manner had never been done. The statistical analysis of this research revealed that if a consumer is confronted with a message emphasizing the beneficial effects of eating this meat, he is more likely to develop a favorability towards it, more so than if the message was based on taste and nutritional qualities.

With regard to the possible effects of using different framing, no different effectiveness was noted between positive framed messages and negative framed messages although in the literature concerning sustainability and animal rights, negative framing would seem to be more effective (Amatulli et al., 2017) (Wang & Basso, 2019) with exceptions (Schneider et al, 2016).

The most interesting findings, however, concern the joint study of the various messages with the age variable. In the literature there has always been a negative correlation between market response and age (Meng et al., 2020) (Mancini & Antonioli, 2019), but research studies have not gone further to find more specific insights. Thanks to this study, it was found that the older public is more susceptible to messages marked by the protection of animal rights rather than environmental protection in accordance with various theories concerning older individuals such as Socioemotional Selectivity Theory (Carstensen, 1995) but this was true only for the purchase intention variable and not for the intention to try, although even for the latter there are signs such as higher average intention to try mean score for respondents who were shown the message focused on animal protection than the environmental message (table 11) that would suggest that even for this variable an ethical focus is better.

From the mediation analysis it emerges that the only significant mediation is that with framing as the independent variable, guilt as the mediator and purchase intention as the independent variable. Observing the results of table 13, it is clear that among the mediators the emotion guilt is the most performing mediator while shame is the least effective.

It can be argued that this study confirmed most of the consumer perceptions uncovered in previous research and enriched the theory with new, more specific, marketing-driven findings.

5.1 Theoretical implications

This paper enriches previous literature in several ways. Based on the fact that favorability toward cultured meat increases when detailed information is provided (Meng et al., 2020), it went further by trying to find a promotional message that would increase consumer market responses.
These findings are very important and establish the foundation for the marketing literature on the topic of cultured meat.
The negative correlation between age and market responses was once again confirmed. The research also, based on the literature focused on the elderly, was able to find an effective message in increasing the propensity to try and buy cultured meat among older consumers who are notoriously more reluctant to change (Carstensen et al., 1999). From there, it was shown that it is possible to model the perceptions of this group of consumers and that research could find other methods of language that are even more effective.
The research, however, also brings discontinuities with previous research. For example, a determining effect of the demographic variables sex, city and education was not identified contrary to other research (Meng et al., 2020) (Mancini & Antonioli, 2019), perhaps due to the mode of delivery of the questionnaires exclusively online (but this will be discussed in the limitations).
Unfortunately, it was not possible to demonstrate that the negative framing message was more effective than the positive framing message, as already seen in eco-friendly and animal friendly contexts (Li et al., 2021) (Williams C. , 2012). The present research has detected only weak indications that the negative guilt emotion, elicited by a negative framed message, is more capable of mediating the relationship between independent variables and market responses.

5.2 Managerial implications

This study also offers significant implications for businesses in the act of sponsoring cultured meat when it hits the mass market. I strongly believe that this time is not so far off: consumers are increasingly demanding and are willing to pay more and more for sustainable products (Nielsen, 2015), and governments themselves are making more and more efforts to ensure the preservation of the planet as evidenced by the fact that at the last G20 in Matera, the planet was one of the three

macro-topics on the agenda (Planet, 2021). This leads to think that cultured meat could have a strong impact on the market but it all depends on the actual organoleptic qualities, the entry price and the communication used by companies operating in the sector.

This research can be of great help precisely to better address the promotion of cultured meat.

Management will have to emphasize the positive effects on the environment and on the quality of life of the animals because it has been shown that focusing on these two topics increases intention to try cultured meat.

Moreover, when dealing with older consumers, it would be better to try to focus the communication exclusively on the beneficial effects that the animals would gain rather than on the environmental ones. It remains however preferable to market this meat to younger individuals as there is a strong negative correlation between age and market responses.

What this research has failed to discover is whether there are demographic variables such as size of municipality of residence or education that can influence market responses. A finding in this regard could be useful to businesses when they come to the time of choosing what type of supply chain to choose.

Lastly, I would like to point out that this was the first research in the field of marketing on cultured meat and that the sector is still in full development, which means that a good entrepreneur will have to take into account all the new trends and issues that will appear as research on this product advances and as it begins to appear on supermarket shelves.

5.3 Limitations and future research

This study also has several limitations. In terms of methodology, snowball sampling was used in this research. Although precautions were taken to limit the negative effects of snowball sampling, this research's sample remains non-probabilistic (Gabor, 2007). Even the mode of delivering questionnaires totally online could bring biases of various kinds (Andrade, 2020) including the fact that respondents, being accustomed to technology, are also more open to novelty (Evans & Mathur, 2005). While non-random samples have always been widely used in the cultured meat literature and are now sort of routine, it might be interesting in the future to organize a live experiment or to collect data through live interviews.

Another limitation lies in the fact that, for the sake of comprehension, the manipulated messages employed in the questionnaire were verbose and repeated. In the future, more immediate messages could be used, even omitting framing as an independent variable, since it has already been verified

that it does not influence market responses, and exploiting the ease of communication that would result from the live verbal delivery of the message.

Other future studies could focus on visual stimuli to be used to better promote cultured meat. Such research, would enjoy a strong literature base as research on visual stimuli on food (Campo et al., 2017) (Spence, 2015) and also eco-friendly messages and packaging abound (Koenig-Lewis et al., 2014) (Magnier & Schoormans, 2015). Do not underestimate the use of images with cute animals as cuteness has surprisingly been little studied so far and is capable, especially in social networks, to generate a lot of engagement.

Also in future research, variables that were not considered in this research could be used such as Openness to Change, as age has been shown to be negatively correlated with this variable (McCrae & Da Costa, 1999), and Willingness to Share.

Finally, one could further study the purchase intention variable by trying to identify the premium price that consumers would be willing to pay in a hypothetical market where there is both classic and cultured meat.

5.4 Conclusions

In conclusion, the study answered the defined research questions and provided, albeit with various limitations, multiple insights for marketing research and practice in the field of cultured meat since its entry in the market is expected in 3-5 years (De Marco, 2021).

In particular, this study has made it possible to demonstrate that communication based on the benefits that the consumption of cultured meat brings to the environment and animals generates better market responses than a message based on taste and nutritional qualities. In addition, it was seen that in the older public, which is not surprisingly more reluctant to try and buy cultured meat, a message based on the protection of animals is more effective than the other two taken into consideration.

It was then seen that a promotion carried out with negative framing, generates high levels of guilt which in turn mediates the relationship between framing and purchase intention.

In a dramatic era where the effects of global warming are under everyone's eyes, cultured meat could help mankind reduce CO2 emissions and the exploitation of energy, water and soil resulting from intensive farming, especially beef.

The hope is that this study will be followed by many others and that it will provide interesting ideas to enrich the literary corpus on the subject.

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Appendix

Appendix 1|Emotion scales employed

	Fortemente in disaccordo						**Fortemente d'accordo**
AS1) Mi sentirei in imbarazzo	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
AS2) Mi vergognerei	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
AS3) Mi sentirei umiliato	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐

	Fortemente in disaccordo						**Fortemente d'accordo**
AG1) Mi sentirei in colpa	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
AG2) Mi sentirei colpevole	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
AG3) Sentirei il rimorso	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐

	Fortemente in disaccordo						**Fortemente d'accordo**
AP1) Mi sentirei realizzato	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
AP2) Mi sentirei bravo	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
AP3) Mi sentirei come se stessi ottenendo	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
AP4) Mi sentirei soddisfatto	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
AP5) Mi sentirei coscienzioso	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐

AP6) Mi sentirei sicuro di me stesso	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
AP7) Mi sentirei produttivo	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐

Appendix 2| Market responses scales employed

	Fortemente in disaccordo						**Fortemente d'accordo**
ItT1) Farò di tutto per provare la carne coltivata quando sarà sul mercato	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
ItT2) Se qualcuno mi darà la carne coltivata, la proverò	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
ItT3) Considerando le informazioni fornitemi, sono molto interessato a provarla	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐

	Fortemente in disaccordo						**Fortemente d'accordo**
PI1) È probabile che comprerò la carne coltivata	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
PI2) In futuro comprerei la carne coltivata	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
PI3) È possibile che comprerò la carne coltivata	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐

Appendix 3| Demographic data collected

Sei vegetariano o vegano?	SI ☐	NO ☐

PARTE 3

Sesso ☐ Uomo ☐ Donna

Età: _____

Titolo di studio: Licenza media ☐ Diploma ☐ Laurea ☐ Master/Dottorato ☐

Comune di residenza: _____

Appendix 4/5/6| Frequencies

Statistics

Sex_0F_1_M

N	Valid	405
	Missing	0
Mean		,57

Sex_0F_1_M

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	182	44,9	44,9	44,9
	1	220	54,3	54,3	99,3
	3	3	,7	,7	100,0
	Total	405	100,0	100,0	

```
DESCRIPTIVES VARIABLES=Age
  /STATISTICS=MEAN STDDEV MIN MAX.
```

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	405	19	69	40,60	13,855
Valid N (listwise)	405				

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Focus * Framing	405	100,0%	0	0,0%	405	100,0%

Focus * Framing Crosstabulation

Count

		Framing		
		Positive framing	Negative framing	Total
Focus	Enviroment protection focus	81	82	163
	Neutral focus	61	57	118
	Animal protection focus	56	68	124
Total		198	207	405

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	13	3,2	3,2	3,2
	2	246	60,7	60,7	64,0
	3	136	33,6	33,6	97,5
	4	10	2,5	2,5	100,0
	Total	405	100,0	100,0	

City

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	201	49,6	49,6	49,6
	2	47	11,6	11,6	61,2
	3	83	20,5	20,5	81,7
	4	74	18,3	18,3	100,0
	Total	405	100,0	100,0	

Vegetarian/Vegan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	371	91,6	91,6	91,6
	1	34	8,4	8,4	100,0
	Total	405	100,0	100,0	

Statistiche di affidabilità

Alpha di Cronbach	N. di elementi
,932	3

Statistiche degli elementi

	Media	Deviazione std.	N
Shame 1	3,14	1,841	405
Shame 2	2,95	1,854	405
Shame 3	2,51	1,714	405

Statistiche elemento-totale

	Media scala se viene eliminato l'elemento	Varianza scala se viene eliminato l'elemento	Correlazione elemento-totale corretta	Alpha di Cronbach se viene eliminato l'elemento
Shame 1	5,46	11,591	,862	,900
Shame 2	5,65	11,358	,880	,886
Shame 3	6,09	12,600	,842	,917

Statistiche di affidabilità

Alpha di Cronbach	N. di elementi
,966	3

Statistiche degli elementi

	Media	Deviazione std.	N
Guilt 1	3,31	2,049	405
Guilt 2	3,21	2,080	405
Guilt 3	3,21	2,079	405

Statistiche elemento-totale

	Media scala se viene eliminato l'elemento	Varianza scala se viene eliminato l'elemento	Correlazione elemento-totale corretta	Alpha di Cronbach se viene eliminato l'elemento
Guilt 1	6,43	16,454	,927	,949
Guilt 2	6,53	16,126	,935	,943
Guilt 3	6,53	16,339	,917	,956

Statistiche di affidabilità

Alpha di Cronbach	N. di elementi
,964	7

Statistiche degli elementi

	Media	Deviazione std.	N
Pride 1	3,40	1,739	405
Pride 2	3,12	1,584	405
Pride 3	3,44	1,853	405
Pride 4	3,49	1,868	405
Pride 5	3,44	1,898	405
Pride 6	3,42	1,748	405
Pride 7	3,40	1,737	405

Statistiche elemento-totale

	Media scala se viene eliminato l'elemento	Varianza scala se viene eliminato l'elemento	Correlazione elemento-totale corretta	Alpha di Cronbach se viene eliminato l'elemento
Pride 1	20,31	94,813	,877	,958
Pride 2	20,59	97,431	,882	,958
Pride 3	20,27	93,335	,859	,960
Pride 4	20,22	92,013	,894	,957
Pride 5	20,27	91,034	,908	,956
Pride 6	20,29	95,172	,859	,959
Pride 7	20,31	95,928	,840	,961

Appendix 8|Market responses' reliability analysis

Reliability Statistics

Cronbach's Alpha	N of Items
,902	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Intention to Try 1	10,83	8,170	,787	,880
Intention to Try 2	9,90	9,617	,780	,886
Intention to Try 3	10,35	8,001	,864	,808

Reliability Statistics

Cronbach's Alpha	N of Items
,961	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Purchase Intention 1	9,23	10,810	,915	,944
Purchase Intention 2	9,12	10,801	,916	,943
Purchase Intention 3	9,19	10,470	,920	,940

Appendix 9|Two-Way ANOVA assumption of homogeneity of variance for ItT

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Intention to Try Average

F	df1	df2	Sig.
,790	5	399	,557

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

Appendix 10| Two-Way ANOVA assumption of normality of distribution for ItT

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Intention to Try Average	405	100,0%	0	0,0%	405	100,0%

Descriptives

			Statistic	Std. Error
Intention to Try Average	Mean		5,1812	,07110
	95% Confidence Interval for Mean	Lower Bound	5,0414	
		Upper Bound	5,3210	
	5% Trimmed Mean		5,2850	
	Median		5,3300	
	Variance		2,048	
	Std. Deviation		1,43095	
	Minimum		1,00	
	Maximum		7,00	
	Range		6,00	
	Interquartile Range		2,00	
	Skewness		-,867	,121
	Kurtosis		,475	,242

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Intention to Try Average	,124	405	,000	,926	405	,000

a. Lilliefors Significance Correction

Appendix 11|Two-Way ANOVA Assumption of homogeneity of variance for Purchase Intention

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Purchase Intention Average

F	df1	df2	Sig.
1,289	5	399	,268

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

Appendix 12|Two-Way ANOVA assumption of normality of distribution for Purchase Intention

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Purchase Intention Average	405	100,0%	0	0,0%	405	100,0%

Descriptives

			Statistic	Std. Error
Purchase Intention Average	Mean		4,5883	,08048
	95% Confidence Interval for Mean	Lower Bound	4,4301	
		Upper Bound	4,7465	
	5% Trimmed Mean		4,6516	
	Median		5,0000	
	Variance		2,623	
	Std. Deviation		1,61955	
	Minimum		1,00	
	Maximum		7,00	
	Range		6,00	
	Interquartile Range		2,33	
	Skewness		-,463	,121
	Kurtosis		-,447	,242

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Purchase Intention Average	,107	405	,000	,952	405	,000

a. Lilliefors Significance Correction

Appendix 13|Cumulative frequencies for age

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	19	2	,5	,5	,5
	20	13	3,2	3,2	3,7
	21	9	2,2	2,2	5,9
	22	8	2,0	2,0	7,9
	23	11	2,7	2,7	10,6
	24	26	6,4	6,4	17,0
	25	18	4,4	4,4	21,5
	26	8	2,0	2,0	23,5
	27	11	2,7	2,7	26,2

	28	4	1,0	1,0	27,2
	29	4	1,0	1,0	28,1
	30	6	1,5	1,5	29,6
	31	5	1,2	1,2	30,9
	32	5	1,2	1,2	32,1
	33	6	1,5	1,5	33,6
	34	6	1,5	1,5	35,1
	35	24	5,9	5,9	41,0
	36	18	4,4	4,4	45,4
	37	14	3,5	3,5	48,9
	38	9	2,2	2,2	51,1
	39	6	1,5	1,5	52,6
	40	6	1,5	1,5	54,1
	41	9	2,2	2,2	56,3
	42	6	1,5	1,5	57,8
	43	2	,5	,5	58,3
	44	7	1,7	1,7	60,0
	45	8	2,0	2,0	62,0
	46	8	2,0	2,0	64,0
	47	5	1,2	1,2	65,2
	48	3	,7	,7	65,9
	49	5	1,2	1,2	67,2
	50	5	1,2	1,2	68,4
	51	7	1,7	1,7	70,1
	52	8	2,0	2,0	72,1
	53	5	1,2	1,2	73,3
	54	16	4,0	4,0	77,3
	55	8	2,0	2,0	79,3
	56	18	4,4	4,4	83,7
	57	5	1,2	1,2	84,9
	58	11	2,7	2,7	87,7
	59	7	1,7	1,7	89,4
	60	11	2,7	2,7	92,1
	61	4	1,0	1,0	93,1
	62	8	2,0	2,0	95,1
	63	4	1,0	1,0	96,0
	64	7	1,7	1,7	97,8
	65	2	,5	,5	98,3
	66	3	,7	,7	99,0
	67	1	,2	,2	99,3

	68	2	,5	,5	99,8
	69	1	,2	,2	100,0
	Total	405	100,0	100,0	

Appendix 14|Assumption of normally distributed independent variables

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Focus	,262	405	,000	,778	405	,000
Framing	,347	405	,000	,636	405	,000

a. Lilliefors Significance Correction

Appendix 15|Assumption of heteroschedasticity for Intention to Try and Purchase Intention

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,021[a]	,000	-,005	1,43420

a. Predictors: (Constant), Framing, Focus

b. Dependent Variable: ITT

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,352	2	,176	,086	,918[b]
	Residual	826,886	402	2,057		
	Total	827,238	404			

a. Dependent Variable: ITT

b. Predictors: (Constant), Framing, Focus

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5,203	,102		50,764	,000
	Focus	-,021	,085	-,012	-,245	,807
	Framing	-,046	,143	-,016	-,325	,745

a. Dependent Variable: ITT

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,035[a]	,001	-,004	1,62256

a. Predictors: (Constant), Framing, Focus

b. Dependent Variable: PI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,323	2	,662	,251	,778[b]
	Residual	1058,351	402	2,633		
	Total	1059,674	404			

a. Dependent Variable: PI

b. Predictors: (Constant), Framing, Focus

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4,644	,116		40,049	,000
	Focus	,033	,096	,017	,337	,736
	Framing	-,102	,161	-,032	-,635	,526

a. Dependent Variable: PI

Appendix 16| Mediation analysis: process outputs

```
Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.5.3 ***************

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

**************************************************************************
Model  : 4
    Y  : ITT
    X  : Framing
    M  : Shame

Covariates:
 City     Age      Edu      Veg

Sample
Size:  405

**************************************************************************
```

```
OUTCOME VARIABLE:
 Shame

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,4976      ,2476     2,1883    21,8286     6,0000   398,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant      ,1885      ,5969      ,3158      ,7523     -,9849     1,3619
Framing      1,5373      ,1476    10,4139      ,0000     1,2471     1,8275
City          ,0730      ,0631     1,1573      ,2478     -,0510      ,1971
Age           ,0187      ,0056     3,3381      ,0009      ,0077      ,0298
Edu           ,1028      ,1318      ,7800      ,4359     -,1563      ,3619
Veg           ,3078      ,2673     1,1517      ,2501     -,2176      ,8332

************************************************************************
OUTCOME VARIABLE:
 ITT

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,5661      ,3204     1,4160    26,7420     7,0000   397,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant     2,3039      ,4802     4,7979      ,0000     1,3599     3,2479
Framing       ,0387      ,1340      ,2891      ,7727     -,2246      ,3021
Shame        -,0379      ,0403     -,9407      ,3474     -,1172      ,0413
City          ,0185      ,0508      ,3630      ,7168     -,0815      ,1184
Age          -,0115      ,0046    -2,5210      ,0121     -,0205     -,0025
Edu          -,1069      ,1061    -1,0072      ,3145     -,3154      ,1017
Veg          -,2816      ,2154    -1,3075      ,1918     -,7050      ,1418

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

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
      ,0387      ,1340      ,2891      ,7727     -,2246      ,3021

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
Shame     -,0583      ,0939     -,2262      ,1440

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

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

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




Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.5.3 ***************

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

************************************************************************
```

```
Model  : 4
    Y  : PI
    X  : Framing
    M  : Shame

Covariates:
 City     Age      Edu      Veg

Sample
Size:  405

**************************************************************************
OUTCOME VARIABLE:
 Shame

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,4976      ,2476     2,1883    21,8286     6,0000   398,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant      ,1885      ,5969      ,3158      ,7523     -,9849     1,3619
Framing      1,5373      ,1476    10,4139      ,0000     1,2471     1,8275
City          ,0730      ,0631     1,1573      ,2478     -,0510      ,1971
Age           ,0187      ,0056     3,3381      ,0009      ,0077      ,0298
Edu           ,1028      ,1318      ,7800      ,4359     -,1563      ,3619
Veg           ,3078      ,2673     1,1517      ,2501     -,2176      ,8332

**************************************************************************
OUTCOME VARIABLE:
 PI

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,5896      ,3477     1,7412    30,2287     7,0000   397,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant      ,6562      ,5325     1,2324      ,2185     -,3906     1,7030
Framing      -,1096      ,1485     -,7381      ,4609     -,4016      ,1824
Shame         ,0203      ,0447      ,4531      ,6507     -,0676      ,1082
City          ,0435      ,0564      ,7709      ,4412     -,0674      ,1543
Age          -,0115      ,0051    -2,2649      ,0241     -,0215     -,0015
Edu           ,0129      ,1176      ,1101      ,9124     -,2183      ,2442
Veg          -,3845      ,2388    -1,6101      ,1082     -,8540      ,0850


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

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
     -,1096      ,1485     -,7381      ,4609     -,4016      ,1824

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
Shame      ,0311      ,1003     -,1557      ,2440

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

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```

```
Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.5.3 ***************

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

**************************************************************************
Model  : 4
    Y  : ITT
    X  : Framing
    M  : Guilt

Covariates:
 City     Age      Edu      Veg

Sample
Size:  405

**************************************************************************
OUTCOME VARIABLE:
 Guilt

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,6557      ,4300     2,3190    50,0411     6,0000   398,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant      ,9201      ,6144     1,4975      ,1350     -,2878     2,1281
Framing      2,5591      ,1520    16,8404      ,0000     2,2604     2,8579
City          ,0461      ,0650      ,7095      ,4784     -,0816      ,1738
Age           ,0101      ,0058     1,7523      ,0805     -,0012      ,0215
Edu          -,1026      ,1357     -,7564      ,4498     -,3693      ,1641
Veg           ,5102      ,2751     1,8542      ,0645     -,0308     1,0511

**************************************************************************
OUTCOME VARIABLE:
 ITT

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,5711      ,3262     1,4040    27,4563     7,0000   397,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant     2,2224      ,4794     4,6355      ,0000     1,2799     3,1650
Framing      -,2263      ,1547    -1,4627      ,1443     -,5305      ,0779
Guilt         ,0808      ,0390     2,0714      ,0390      ,0041      ,1575
City          ,0120      ,0506      ,2365      ,8132     -,0875      ,1114
Age          -,0131      ,0045    -2,8958      ,0040     -,0219     -,0042
Edu          -,1025      ,1056     -,9699      ,3327     -,3101      ,1052
Veg          -,3345      ,2150    -1,5556      ,1206     -,7572      ,0882
OtC           ,6677      ,0556    11,9996      ,0000      ,5583      ,7771

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

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
     -,2263      ,1547    -1,4627      ,1443     -,5305      ,0779

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
Guilt      ,2067      ,1402     -,0651      ,4879

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

Level of confidence for all confidence intervals in output:
```

```
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

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



Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.5.3 ***************

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

**************************************************************************
Model  : 4
    Y  : PI
    X  : Framing
    M  : Guilt

Covariates:
 City     Age      Edu      Veg

Sample
Size:  405

**************************************************************************
OUTCOME VARIABLE:
 Guilt

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,6557      ,4300     2,3190    50,0411     6,0000   398,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant      ,9201      ,6144     1,4975      ,1350     -,2878     2,1281
Framing      2,5591      ,1520    16,8404      ,0000     2,2604     2,8579
City          ,0461      ,0650      ,7095      ,4784     -,0816      ,1738
Age           ,0101      ,0058     1,7523      ,0805     -,0012      ,0215
Edu          -,1026      ,1357     -,7564      ,4498     -,3693      ,1641
Veg           ,5102      ,2751     1,8542      ,0645     -,0308     1,0511

**************************************************************************
OUTCOME VARIABLE:
 PI

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,6016      ,3619     1,7033    32,1633     7,0000   397,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant      ,5412      ,5281     1,0248      ,3061     -,4970     1,5793
Framing      -,4091      ,1704    -2,4003      ,0168     -,7441     -,0740
Guilt         ,1292      ,0430     3,0072      ,0028      ,0447      ,2136
City          ,0390      ,0557      ,6999      ,4844     -,0705      ,1485
Age          -,0124      ,0050    -2,4996      ,0128     -,0222     -,0027
Edu           ,0283      ,1164      ,2431      ,8080     -,2005      ,2570
Veg          -,4442      ,2368    -1,8756      ,0614     -,9097      ,0214

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

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
```

```
     -,4091      ,1704    -2,4003      ,0168     -,7441     -,0740

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
Guilt      ,3306      ,1421      ,0652      ,6274

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

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

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


Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.5.3 ***************

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

**************************************************************************
Model  : 4
    Y  : ITT
    X  : Framing
    M  : Pride

Covariates:
 City     Age      Edu      Veg

Sample
Size:  405

**************************************************************************
OUTCOME VARIABLE:
 Pride

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,5806      ,3370     1,7517    33,7243     6,0000   398,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant     3,9226      ,5340     7,3454      ,0000     2,8727     4,9725
Framing     -1,8531      ,1321   -14,0303      ,0000    -2,1127    -1,5934
City         -,0683      ,0565    -1,2092      ,2273     -,1792      ,0427
Age          -,0006      ,0050     -,1143      ,9091     -,0104      ,0093
Edu           ,1324      ,1179     1,1232      ,2620     -,0994      ,3642
Veg          -,1692      ,2391     -,7076      ,4796     -,6393      ,3009

**************************************************************************
OUTCOME VARIABLE:
 ITT

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,5677      ,3223     1,4122    26,9662     7,0000   397,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant     2,0500      ,5110     4,0120      ,0001     1,0455     3,0545
Framing       ,0970      ,1450      ,6690      ,5039     -,1880      ,3820
Pride         ,0629      ,0450     1,3978      ,1629     -,0256      ,1514
City          ,0200      ,0508      ,3934      ,6942     -,0799      ,1198
Age          -,0122      ,0045    -2,7090      ,0070     -,0211     -,0033
```

```
Edu          -,1191      ,1060    -1,1230      ,2621     -,3275      ,0894
Veg          -,2826      ,2148    -1,3154      ,1891     -,7050      ,1398

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

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
      ,0970      ,1450      ,6690      ,5039     -,1880      ,3820

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
Pride     -,1166      ,1168     -,3447      ,1194

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

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

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




Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.5.3 ***************

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

**************************************************************************
Model  : 4
    Y  : PI
    X  : Framing
    M  : Pride

Covariates:
 City     Age      Edu      Veg

Sample
Size:  405

**************************************************************************
OUTCOME VARIABLE:
 Pride

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,5806      ,3370     1,7517    33,7243     6,0000   398,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant     3,9226      ,5340     7,3454      ,0000     2,8727     4,9725
Framing     -1,8531      ,1321   -14,0303      ,0000    -2,1127    -1,5934
City         -,0683      ,0565    -1,2092      ,2273     -,1792      ,0427
Age          -,0006      ,0050     -,1143      ,9091     -,0104      ,0093
Edu           ,1324      ,1179     1,1232      ,2620     -,0994      ,3642
Veg          -,1692      ,2391     -,7076      ,4796     -,6393      ,3009

**************************************************************************
OUTCOME VARIABLE:
 PI
```

```
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      ,5929      ,3515     1,7310    30,7414     7,0000   397,0000      ,0000

Model
             coeff         se          t          p       LLCI       ULCI
constant      ,3481      ,5657      ,6153      ,5387     -,7640     1,4602
Framing       ,0689      ,1605      ,4292      ,6680     -,2467      ,3844
Pride         ,0795      ,0498     1,5961      ,1113     -,0184      ,1775
City          ,0504      ,0562      ,8959      ,3708     -,0602      ,1609
Age          -,0111      ,0050    -2,2179      ,0271     -,0209     -,0013
Edu           ,0045      ,1174      ,0383      ,9695     -,2263      ,2353
Veg          -,3648      ,2379    -1,5337      ,1259     -,8324      ,1028

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

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
      ,0689      ,1605      ,4292      ,6680     -,2467      ,3844

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
Pride     -,1474      ,1139     -,3634      ,0774

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

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```

Summary

Introduction

The role of meat in food consumption has very deep roots (Zaraska, 2016). The turning point, in which the meat production chain actually became an industry, took place at the end of the nineteenth century in the U.S when, a real mass industry began to develop around cattle breeding and slaughtering activities. Nowadays, the meat industry is expected to value 1.5 trillion dollar in 2022 (Shahbandeh, 2019) and to grow stably seen that world's population is going to reach more than 9.1 billion by 2050 (United Nations, 2019). Per capita meat consumption is forecasted to remain steady at around 35 kilograms of meat per year. Moreover, the industry provides the 37% of the global protein need.

Such important numbers cannot fail to have important repercussions worldwide. While meat is a formidable source of protein and sustenance for humans, there are two important drawbacks.

The first issue is environmental. Today the meat industry is responsible of the 14% of global emissions, more than the entire transport industry (Falduto, 2019). Meat production is a decidedly inefficient system of food production from a resource use perspective. Its production involves the use of 83% of agricultural land and one third of the water used for agriculture. The link between meat production and climate change, however, lies in the enormous quantities of greenhouse gases that it releases into the atmosphere. First of all, raising animals involves the direct emission of an important greenhouse gas: methane that is capable of trapping 84 times more heat than CO2 in the first two decades after it is released into the atmosphere (Powell, 2019). On an aggregate level, the flatulence of hundreds of thousands of cows has a significant impact, accounting for about 30% of global methane emissions (Department for Environment Food and Rural Affairs, 2006).

Livestock farming is also indirectly responsible for the emission of CO2 into the air. To support the 70 billion livestock animals that now populate the planet, hundreds of thousands of hectares of forests and woodlands have been destroyed in recent decades. According to WWF about 80% of the deforestation of the Amazon rainforest is due to the need to make room for cattle farms (Nepstad et al, 2008).

The second issue arising from the mass production of meat is the ethical one. Indeed, animals are brutally killed and deprived of their freedom in contrast to what is stated in the Universal Declaration of Animal Rights (UNESCO, 1978). Many people, especially those who live in contact with animals, empathize with them recognizing in them behaviors and emotions typical of humans.

To date, however, it has been scientifically demonstrated that animals have emotions like those normally felt by humans (Briefer et al, 2015) (Lesimple et al, 2011). More and more people, moved by their

feelings, are becoming vegan or vegetarian (Ploll & Stern, 2020) and even actively involved in protests and initiatives against the consumption of meat.

To overcome these ethical and sustainability issues discussed below, multiple solutions have been developed. Even if the percentage of vegetarians and vegans is growing in Italy (EURISPES, 2020) and in the European Union (IFES, 2017), the majority of the collectivity does not want to deprive itself of meat, therefore, rather than trying to limit its consumption, attempts have been made to find attractive alternatives. To date, the resolution of these problems seems to lie in the technological development of alternatives reminiscent of flesh.

The first alternative, already easily available in supermarkets, is the plant-based meat. Plant-based meat is literally meat made from plants. It is planned and created to remind, taste like, and nurture like conventional meat. Its popularity is growing year after year and its market share is increasing in the world (Polaris Market Research, 2020) and in Italy (Agriculture and Agri-Food Canada, 2019), as opposed to traditional meat which is expected to remain stable in Italy (Eurostat, 2020).

The second alternative concerns a new type of meat that only came to light in 2012: cultured meat. This is an artificial edible meat created in laboratory starting from beef or other animals stem cells culture. Is considered a product of high tissue engineering since its creator, Mark Post, had the idea when he thought that in his laboratory, could be produced meat in vitro as well as pieces of tissue to be used in surgical rooms (Post, 2012).

The idea turned out to be a winner. In 2013, the first burger without the use of animals was produced for the modest sum of $330000 (Singer, 2013). Obviously, with such a price, cultured meat was totally unaffordable, but to date many realities are active and able to produce this meat at lower prices. Moreover, a restaurant in Singapore is already serving it to its customers (Scipioni, 2020).

Research aims and objectives

Based on this information, both alternatives are valid but consumer perceptions of plant-based meat have already been abundantly studied and little research attention has been paid to the study of consumer perceptions toward cultured meat. The present research, therefore, will focus on cultured meat, trying to provide new insights on the variables influencing its acceptance and trying to find the right incentives to help companies in view of its future launch on the market.

Specifically, the objectives of the research are listed below:

- Of particular interest is the investigation of the framing of promotional messages. In fact, it has been demonstrated how a message presented in different ways can lead consumers facing a certain decision to make different and predictable decisions (Tversky & Kahneman, 1981).

- Another research objective is to find out which focus might be relevant to consumers and which might improve market responses through its use.

- A third objective of the present work is to investigate the influence of demographic variables such as age, gender and level of education, in order to gain insight into which market segments might be attractive in the future and what type of communication to use with them.

The rise of cultured meat

Since the Dutch scientist Mark J. Post published his article announcing the possibility of producing meat in vitro (Post, 2012), a relevant number of studies have been carried out to analyze implications and consumer perceptions. Research has shown that the first impact is not positive. In Italy, a 2018's Ixè survey found a 75% unfavourability when it came to making a judgment about its impending market entry[2]. Another survey in three Chinese cities found that only 24.2% were inclined to accept this product and, after providing information about the technology and reporting its benefits, this acceptance rate jumped to 45.5% (Meng et al., 2020). Other studies in which respondents were informed a priori about the characteristics of the cultured meat reported good levels of willingness to try and confirmed the goodness of providing information. In this regard, two surveys carried out in 2013 in the Netherlands and England verified that the willingness to try stood at 52% and 65% respectively (Flycatcher) (The Guardian, 2013). A survey conducted in the U.S. 4 years later confirms a willingness to try of 65% (Wilks & Phillips, 2017).

However, not all literature records positive impressions about cultured meat. In a survey in which consumers are faced with a hypothetical choice between beef, plant-based meat, and cultured meat at the same price, only 10.6% of respondents expressed a preference for the latter (Slade, 2018), so consumer attitudes towards cultured meat are generally good, but not the performance in a hypothetical future market. Ultimately, Regarding Italy, in recent times only two studies measured willingness to try and obtained a percentage of positive respondents' answers of 54% and 78% respectively (Mancini & Antonioli, 2019) (Palmieri & Lupi, 2020).

[2] https://www.statista.com/statistics/945453/opinion-on-cultured-meat-in-italy/#statisticContainer

Other papers proposed a qualitative type of investigation and provided guidelines for future research in the field. Underlying consumer rejection are paradigms of unnaturalness, playing god and messing with nature (Verbeke et al., 2015) (Bryant & Barnett, 2018) while underpinning a positive attitude are mainly the benefits of increased sustainability and ethical living (Bryant & Barnett, 2018) (Palmieri & Lupi, 2020).

It is important to specify that the environmental benefits of consuming cultured meat are still under discussion and is not yet clear in which fields and in which entity may occur. Early research was quite optimistic but most recent research has adjusted the figure to reveal that the water and energy footprint is actually higher than initially thought (Tuomisto et al., 2014) and that in the case of poultry and pork, energy use is even higher while confirming lower greenhouse gas emissions and lower land usage. Regarding beef, the environmental benefits are confirmed although it is acknowledged that the energy that would be used is essentially the same as that required today (Mattick et al., 2015).

All studies agree on the identikit of the person who is most likely to have positive attitudes towards cultured meat: male, young, educated, liberal-minded and living in big cities whereas older people with conservative political views and less education seem to be more reluctant even when it comes to just tasting. Similar demographic findings were also found for GMO (Genetic Modified Organism) food and organic food (Magnusson & Hursti, 2002) (Canavari et.al., 2002). Last but not least, Christopher Bryant stated that in a Michael Sigriest's research they "found a significantly higher rate of acceptance when participants were given a non-technical description of cultured meat compared to a technical description due to a difference in perceived naturalness and evoked disgust" (Cited in Siegrist et al., 2018).

The effects of message framing

In contrast to the literature on cultured meat, the literature on message framing has a larger and older corpus of research, but whose conclusions are markedly mixed. Message framing refers to the way in which a piece of information about a certain topic is presented to people. Interestingly, consumer response to this information may vary as a function of message framing confirming that it is markedly important for businesses communication and marketing in particular as it is able to shape consumer behavior (Shiv et al, 1997).

The conventional beginning of the literature on this topic coincides with the formulation of the prospect theory by Kahneman and Tversky (1991), and from then on, in increasing measure, various studies followed. Levin (1998) conducted a qualitative study making transparency in the field of studies by defining the difference between negatively framed message and positively framed message. The former focuses on the negative consequences of not doing a proposed action while the latter focuses on the

positive consequences of performing a proposed action. However, neither of these two types of framing has proven to be more effective than the other in shaping consumer perceptions and behavior. In some cases, one is more effective, at other times, the other one is. The discrepancy seems to lie in various variables at play, such as the context (e.g., preventing health issues, sustainability, ethical problems), the temporal and geographical distance of the consequences, the uncertainty of their occurrence, the language and the tone of voice used.

The emotions' power

Emotions are mental and physiological states associated with psychological changes, internal or external, natural, or learned stimuli (Stangor & Walinga, 2014). Most of today's theories define emotions, or rather emotional experiences, as a multidimensional process (and not as a state), articulated in several components and with an evolving time course. This multidimensional structure differentiates emotions from other psychological phenomena (such as perceptions or thoughts) (Thompson, 1990).

Feelings can influence attitudes, judgments and so actions of individuals too. Even, in the scientific field, emotions are autonomous, paramount and have greater power to influence social behavior than rational cognitive thinking (Zajonc, 2000).

We distinguish between emotions that have a positive valence and those that have a negative valence. They lead to different effects (Forgas, 2001). In addition, we have more specific emotions, both positive, such as happiness and pride, and negative, such as anger, guilt and shame (Lerner & Keltner, 2000).

To complete the emotions' theoretical framework, a distinction must be made between anticipated and anticipatory emotions. Anticipated emotions are affective reactions that someone may imagine experiencingin the future when certain events have occurred; anticipatory emotions are emotions currently experienced due to something that could happen in the future (Baugartner, Pieters, & Bagozzi, 2010).

Emotions mediating environmentally friendly behavior

In marketing research concerning sustainable products and green advertising, the binomial between emotions and message framing is one of the most investigated themes and it has been demonstrated that emotions are able to mediate pro-environmental behavior (Onwezen et al, 2014) and that negative or positive framed messages can trigger different affective reactions (Baek & Yoon, 2017).

Even in the green context, the literature has not been unanimous about which message framing is the most effective. For example, two research studies have investigated, in the moment just before a consumer is called to make a decision about an eco-friendly purchase, which one between a positive and a negative framed message was more effective and which emotions had the role of mediators. The results

were completely opposite: in the first research, the negatively framed message proved to be more effective in influencing the purchase decision, and the mediating emotion turned out to be the anticipated shame, clearly one of negative valence (Amatulli et al., 2017), while in the second one the positively framed message prevailed in modeling consumer attitudes, and the emotion that mediated the relationship between the dependent and independent variable was one with positive valence: anticipated pride (Schneider et al, 2016).

Lastly, since what drives the consumption of cultured meat are environmental and ethical benefits, it is necessary to expose the literature on framing and feelings also in the field of ethics and more specifically in the field of animal rights.

In this regard, the most used and effective technique seems to arouse negative emotions to elicit prosocial behavior. This is true when it comes, for example, to donating money or goods for charitable activities (De Luca et al, 2015), or perhaps when it comes to enticing people to donate blood (Renner et al, 2013). When dealing with animals and their rights, the discussion remains essentially the same because the objective of the communication used is to provoke negative emotions such as guilt (Fernandez, 2020).

Hypotheses formulation and conceptual model

In light of the information in the previous chapter, the research hypotheses will now be formulated.

The hypotheses, and more generally the research, will have a marketing focus: the goal is to identify what type of promoting communication might be used when this product will be on the market.

In terms of the type of communication to be used, the first element that will be addressed is the focus of the message. It is well known that the reasons why cultured meat is welcomed by consumers are the fact that it gives several advantages from an environmental and ethical point of view (Bryant & Barnett, 2018) (Palmieri & Lupi, 2020), so it is certainly sensible to investigate the effects of a communication based on these two arguments.

Another focus that might be of interest to the topic is flavor and nutritional properties. In fact, flavor, along with price, is the primary driver of meat purchase, especially in older generations with greater purchasing power (Fromm, 2019). However, since the reasons for choosing an alternative to meat lie mainly in ethical and environmental reasons (Krizmanic, 1992), it is expected that communication based on these two focuses will generate better market responses.

Therefore, it is hypothesized:

H1a: A message with a focus on animal protection or environmental protection is more effective in generating high levels of intention to try cultured meat than a neutral focus on taste and nutritional properties.
H1b: A message with a focus on animal protection or environmental protection is more effective in generating high levels of purchase intention for cultured meat than a neutral focus on taste and nutritional properties.

In the previous chapter, it was seen that there is actually no specific framing that works for all situations, but in the area of pro-environmental communication, it has been observed that negative framed messages are more effective (Amatulli et al., 2017) (Patrick et al., 2009) (Li et al., 2021) and that a potential future loss is more relevant than a future gain (Hardisty & Weber, 2009). There is no shortage of research where positive framed messages generate better results (Schneider et al, 2016) but still in lower numbers.
In the social domain, there is ample evidence that negative framing is more effective in generating prosocial behavior (Renner et al, 2013) (De Luca et al, 2015) and since one of the focuses of manipulative messages centers on animal welfare, this is a very important insight in view of hypothesis formulation.

Therefore, hypotheses about the topic will be:
H1c: A message with a negative framing generates higher levels of intention to try cultured meat than a positive framing.
H1d: A message with a negative framing generates higher levels of purchase intention cultured meat than a positive framing.

In the literature review, it was seen that emotions can play an important role in mediating certain behaviors (Bagozzi, 1998). Usually, negative emotions are elicited by negatively framed messages, and positive emotions by positively framed messages. Since there is no unequivocal judgment on the type of framing, three emotions were ultimately considered: two negative and one positive, among the most used in research on green communication and animal welfare. These are anticipated pride, anticipated shame and anticipated guilt.
Hence hypotheses about emotions can be divided in those in which emotions are the trigger:
H2a: Anticipated shame is positively correlated with intention to try
H2b: Anticipated guilt is positively correlated with intention to try
H2c: Anticipated pride is positively correlated with intention to try
H2d: Anticipated shame is positively correlated with purchase intention
H2e: Anticipated guilt is positively correlated with purchase intention
H2f: Anticipated pride is positively correlated with purchase intention

And those in which emotions are the mediators:

H3a: Anticipated shame mediates the relationship between framing and intention to try

H3b: Anticipated guilt mediates the relationship between framing and intention to try

H3c: Anticipated pride mediates the relationship between framing and intention to try

H3d: Anticipated shame mediates the relationship between framing and purchase intention

H3e: Anticipated guilt mediates the relationship between framing and purchase intention

H3f: Anticipated pride mediates the relationship between framing and purchase intention.

Finally, we need to make considerations about the effect of age on intention to try and purchase intention. It is reasonable that young people will have a more positive consideration of cultured meat than adults. The reason for this phenomenon lies in several aspects. First, it is observed that as humans get older, they are less willing to accept changes in their lives (Westerhoff, 2008) and more specifically, also in a hypothetical purchase scenario, when aging individuals are asked to choose between a contemporary and a traditional product they are more likely to get the latter (Peluso et al., 2020). This is just one of the differences in reasoning present among individuals of different ages. Carstensen (1995) has formulated the Socioemotional Selectivity Theory, which aims to explain the shift of individual goals and behaviors with age. This theory states that humans also tend to behave and make choices based on the time they perceive is left in a kind of future time perspective. This assumption could be reflected by giving different outcomes in relation to the independent variable "focus" of this research. In fact, remembering that the focus of the manipulative research message is on animal protection, the environment and the taste and nutritional properties of cultured meat, older people are less likely to be concerned about climate change and less likely to behave sustainably than youngsters (Coldiretti-Ixè, 2020) (McKinsey & Company, 2020) (Gallup, 2018) probably due to a reduced future time perspective too.

This suggests that, among the three aforementioned focuses, the one based on animal protection could be more effective than the others among the oldest because the thought of animal protection could have a more emotional appeal than the others and because the company of a pet, already has an important role in alleviating loneliness among the elderly (Stanley et al., 2014).

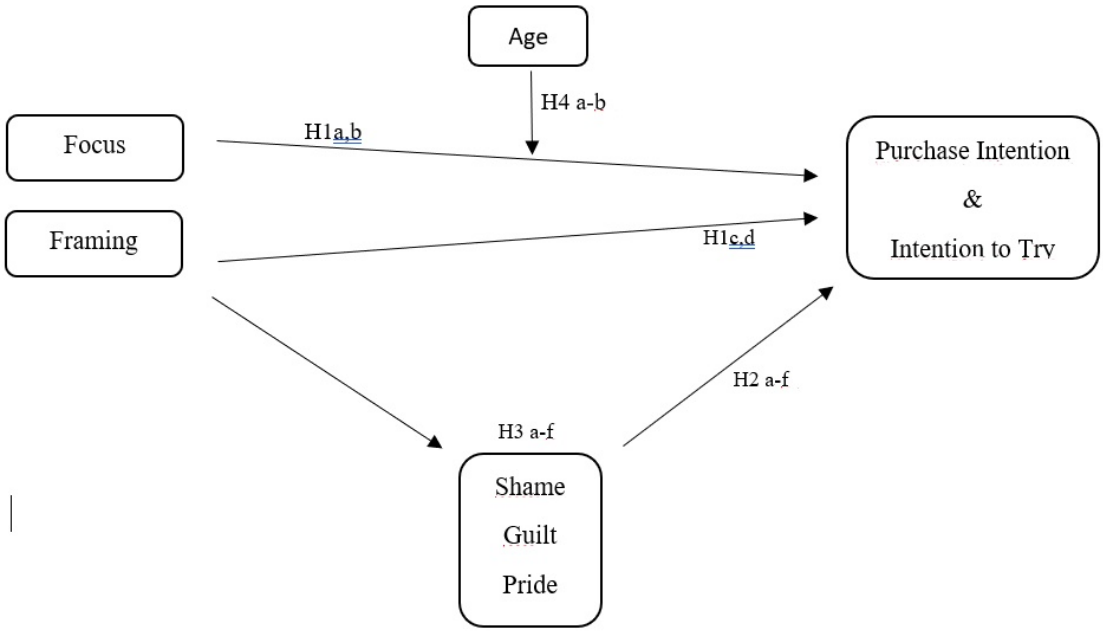
Ultimately, often when we think of animals, we detect some cuteness in them. The cuteness is able to activate in human instinctive feelings of protection and caregiving, a kind of parental brain (Kringelbach et al, 2016). This sort of caring feelings might be stronger in older individuals who have already had the opportunity to be parents and care for other animals and people.

This completes the framework to be able to formulate the last two hypotheses:

H4a: Among older respondents, a message focused on animal protection is more effective in generating high levels of intention to try than the other two focuses

H4b: Among older respondents, a message focused on animal protection is more effective in generating high levels of purchase intention than the other two focuses.

To summarize, here is the conceptual framework of the hypotheses.



Methods, analysis and findings

Questionnaire and sample composition

To summarize the methodology employed to test the hypotheses and respond to the research questions, consumers' opinions on the topic of cultured meat have been collected. To do this, the tool used was a questionnaire administered exclusively online due to Covid regulations.

The survey consisted of four sections: In the first section, respondents were briefed about what cultured meat was and what could be the reasons about its possible rise in the next years, then, they were randomly shown a manipulative message from the six available.

The central message employed in the research survey was developed in six versions that differently combined message frame (positive vs. negative) and message focus (animal protection, environmental protection, neutral). The neutral version stated that cultured meat has the same nutritional properties and taste as classic meat. The version with a focus on environmental protection stated that consuming

cultured meat would reduce environmental damage. The one with a focus on animal protection stated that consuming cultured meat would save several lives of livestock. Each of these three messages exhibited either a positive or a negative frame. The positively framed message puts the consumer in front of a hypothetical choice of buying the cultured meat where he/she buys it thus having positive implications. The negatively framed message puts the consumer in front of a hypothetical choice to buy cultured meat where he/she does not buy it thus causing negative consequences. The validity of the procedure was demonstrated in a previous research study where it was shown that hypothetical choices about food are matched in real life (Chang et. al., 2009).

Given the high number of manipulative messages, before the distribution of the questionnaires, it had been set out to collect at least 400 valid responses.

In the second part of the survey, the presence and extent of mediating emotions was measured which, as indicated in the previous chapter, were anticipated guilt and anticipated shame as emotions with negative valence, and anticipated pride as positive one. In the third part, there are one to seven scored scales taken from other famous research and adapted to the situation to detect the willingness to try cultured meat and willingness to buy. Finally, in the fourth and final part, sociodemographic data of the participants were collected, including age, level of education, municipality and whether they belonged to vegetarian or vegan categories, certainly another variable that could strongly influence the responses.

The questionnaire was administered to a sample of Italian consumers. This sample can be considered non-random because, for various logistical and economic reasons, it was not possible to reach a representative sample. However, in the field of research on cultured meat, convenience samples are widely used, and are now part of a sort of standard procedure (J.F. Hocquette et.al., 2015) (Mancini & Antonioli, 2019) (Siegrist et al., 2018).

Responses from respondents under 18 years old for legal reasons, and over 70 years old were excluded. In addition, it was decided to eliminate questionnaires with at least one incomplete field and those in which it was apparent that proper care had not been employed.

The procedure employed to gather questionnaires is ascribed to snowball sampling. This type of sample, however, is not representative of the population, and the results obtained from it are biased; therefore, intervention was made using Prolific.co (https://www.prolific.co/), an online platform that allows you to recruit survey participants with certain characteristics defined a priori for a small fee. This has made it possible to correct the composition of the sample on the fly making it more similar to the composition of the Italian population.

The total number of valid responses collected is 405. Of these 405 respondents, we included 182 women, who thus make up 44.9% of the sample, and 220 men, who represent 54.3% of the sample, plus three people who did not identify themselves with any gender group.

Regarding age, the average age of the respondents was 40.6, ranging from a minimum of 19 years to a maximum of 69. The balance between the age groups that was set to be respected in the preliminary phase was fairly well respected as the age group from 19 to 34 years old represents 35.06% of the sample (n=142), that from 35 to 50 years old represents 33.33% (n=135), and finally the age group representing those older than 50 years old makes up 31.6% of the sample (n=128).

Of the 405 responses, 198 are from questionnaires in which positive framing is used, the other 207, are from questionnaires that used negative framing. Regarding the focus of manipulative messages, we include 163 survey forms with a focus on environmental protection, 118 with a neutral focus on nutritional qualities and taste, and finally 124 with a specific concern for animal protection.

Analysis

Reliability analysis

Before proceeding to the main analysis, it is advisable to perform a reliability analysis for the scales employed. For a reliability analysis of the scales used in the study, the Cronbach alpha is used. The value of Cronbach Alpha ranges from 0 to 1 and the closer it is to 1, the more reliable the scale is considered to be (Leontitsis & Pagge, 2007).

Starting with the multi-item scales designed to measure mediators, we record Cronbach's alpha values of 0.932, 0.966 and 0.964 for anticipated shame, anticipated guilt and anticipated pride, respectively.

The same procedure was performed for all other multi-item scales. The recorded Cronbach values showed excellent reliability for each of them, and no items were eliminated. Specifically, the Cronbach alphas recorded for the other scales were 0.902 for intention to try and 0.961 for purchase intention.

Relationship analysis

To get a preliminary idea about the hypotheses, a correlation analysis will now be done between the variables involved. Correlation analysis is generally done to see if there is in fact a correlation between two variables (Archdeacon, 1994). If there is a correlation between two variables that are expected to be dependent on each other, the right track has been taken. Two variables that are not correlated with each other cannot be dependent. Conversely, if two variables are correlated it does not mean they are dependent, so if so, further analysis is required.

The first relationship in which a possible link will be sought is that between independent variable framing and mediators that consists of the three emotions. Eta square will be employed.

The analysis revealed that all relationships are significant (p values = 0,000 < α = 0,05) and also the eta squared values are high (0,218, 0,414, 0,329). This leads us to conclude that there is a strong correlation between the variables and that we are well on our way to being able to test the H3 family hypothesis.
The correlation between mediators and dependent variables, if verified, could be a second step in being able to demonstrate an existence of mediation. To proceed, the coefficient Pearson's *r* will be computed. As expected, there is a significant correlation between the mediators, particularly positive between anticipated shame and anticipated guilt and negative between anticipated pride and the two negative emotions (p values > 0,025; $\alpha/2$ = 0,025) Similarly, we note a positive and significant correlation between the dependent variables (p value > 0,025; $\alpha/2$ = 0,025).
Moreover, we can see like the coefficients, speak about weak relationships between the emotions and the market responses, plus, no relationship is significant (p values > 0,025; $\alpha/2$ = 0,025). This might suggest that a possible problem in the subsequent mediation analysis as it would seem that only the relationships between purchase intention and anticipated guilt and purchase intention and anticipated pride can reach significance (p value < 0,1).
Considering these results, hypotheses H2a, H2b, H2c, H2d, H2e and H2f are not supported.
The relationship analysis will now be completed by probing the relations between independent variables, in this case Focus and Framing, and dependent variables, that are intention to try and purchase intention. The results show that, again, there is no significant correlation between the variables (p values > 0,05; α = 0,05). The only relationship that there might be slightly significant is between focus and intention to try (p value < 0,1) In the next chapter about inference, it will be seen how these variables interact.

Inferential analysis

Inferential statistics is the branch of statistics that studies partial and sample surveys of a population. It is also called statistical inference. It deals with analyzing data obtained from a sample of the population to estimate a statistical phenomenon over the entire reference population (Azzalini, 2001). In this case, the variables capable of influencing market responses (intention to try, purchase intention) will be investigated to answer the research questions.
In the following step, thanks to the statistical analysis of variance, i.e. ANOVA, it was tested the significance of the resulting difference between the mean values of variables as observed across the different groups of respondents assigned to the experimental conditions. Since there are two independent variables and one has more than two categories, the analysis employed will be a Two-Way ANOVA.
The first relationship that will be tested is that between the focus used and framing with intention to try. In the variables involved, no outliers were found, the assumption of homogeneity of variance is respected

and moreover, since the sample is very large, despite not having a Shapiro Wilk test that shows that the dependent variable is not normally distributed we can say that the assumptions are respected.
The results of the Two-Way ANOVA having intention to try as the dependent variable and Sex, Age, Education, City and Veg as covariates revealed that the framing variable failed to affect the dependent variable in a significant way. Therefore, hypothesis H1c is rejected.
The focus variable, instead, has a marginally significant effect on intention to try (0,1 > p value > 0,05). Looking at the means, we find that the focus on environmental protection and animal protection is more effective than the focus on taste and nutritional properties in influencing the intention to try. We can therefore accept hypothesis H1a.
Among the covariates we include a significant effect of age that will be analyzed later.
The same analysis will come carried out now for the dependent variable purchase intention. Also in this case, the assumptions of the ANOVA are respected. In this case, neither Focus nor Framing have a statistically significant effect on purchase intention (p values > 0,05; $\alpha = 0,05$). We must therefore reject the H1b and H1d hypotheses and accept the null hypotheses H0.
In both Two-Way ANOVA analyses, age stands out among the covariates as having a significant effect on intention to try and purchase intention. A correlation analysis reveals that as age decreases, the inclination of the consumer to try and buy cultured meat tends to increase.

Effect of focus on advanced age respondents

To test now the hypothesis about the greater effectiveness of animal focus for the more advanced age group, an analysis will be made by dividing the responses into three groups: a first of 33% of younger respondents, another 33% intermediate and finally the third group of interest composed of the responses of more senior participants.
A Two-Way ANOVA performed taking into account only the oldest age group, reveals that the focus for this age group has a significant effect on these respondents' purchase intention and intention to try. Mean values for intention to try and purchase intention demonstrate that the focus on animals is effective in generating higher levels of intention to try and purchase intention.
A comparison on the means to see if their discrepancies are significant has been made and reveals that we can accept the hypothesis H4b, therefore, in the older age group, a focus centered on animal protection is capable of generating higher levels of purchase intention than the other two focuses would be able to. The same thing, unfortunately, is not possible in the case in which the dependent variable in examination is the intention to try. The significance value connected to the analysis of the difference between the means generated by the environmental and animal friendly focuses is not significant (p value > 0,05; $\alpha = 0,05$). Therefore, the hypothesis H4a must be rejected.

Mediation analysis

It is the turn to investigate whether feelings have a mediating effect between framing and dependent variables in order to best answer the hypotheses. The emotions we will account for in the analysis are anticipated guilt, anticipated shame and anticipated pride.

Mediation analysis aims to detect and understand the underlying influence that address a relationship between a dependent and independent variable, caused by a third hypothetical variable called mediator (Hayes, 2014). Since when a mediation analysis is being done, a regression analysis is being run, the assumptions of the regression will be checked.

After some tests, it is possible to conclude that the assumptions are all respected and it is possible to proceed to the mediation analysis.

The process model that will be used in the analysis will be number 4, which is one that relates one independent variable, one mediator, and one dependent variable at a time. Being the number of independent variables one, the number of mediators 3 and the number of dependent variables 2, the test with this model will be repeated 6 times.

From the results, it can be seen that five out of six mediating relationships are not significant since the value zero was comprised in the bootstraps' confidence interval. The only relationship that is significant is the one in which Framing is the independent variable, anticipated guilt sentiment is the mediator, and purchase intention is the dependent variable. The coefficient "a" of the report is very high (a=2.5591), a sign that the manipulative message, when a negative framing was used, was capable of generating high levels of guilt. The guilt feeling was then able to induce, in the hypothetical purchase situation proposed in the questionnaire, high intention of purchase.

In agreement with the data collected, we can conclude that a 44,69% proportion of total effect, operates through the mediation on the dependent variable.

Among the hypotheses of mediation therefore, we accept only the H3e while the rest will be all rejected.

Discussion

This study investigated what would be the best type of communication to use to promote cultured meat by considering two different types of framing and using three distinct focuses. It also sought to understand which message combinations were most effective for different age groups of the audience.

The statistical analysis of this research revealed that if a consumer is confronted with a message emphasizing the beneficial effects of eating this meat, he is more likely to develop a favorability towards it, more so than if the message was based on taste and nutritional qualities.

With regard to the possible effects of using different framing, no different effectiveness was noted between positive framed messages and negative framed messages.
The most interesting findings, however, concern the joint study of the various messages with the age variable. Thanks to this study, it was found that the older public is more susceptible to messages marked by the protection of animal rights rather than environmental protection in accordance with various theories concerning older individuals such as Socioemotional Selectivity Theory (Carstensen, 1995) but this was true only for the purchase intention variable even if for the variable intention to try, the tendency is the same one.
From the mediation analysis it emerges that the only significant mediation is that with framing as the independent variable, guilt as the mediator and purchase intention as the independent variable.
It can be argued that this study confirmed most of the consumer perceptions uncovered in previous research and enriched the theory with new, more specific, marketing-driven findings.

Theoretical implications

This paper enriches previous literature in several ways. Based on the fact that favorability toward cultured meat increases when detailed information is provided (Meng et al., 2020), it went further by trying to find a promotional message that would increase consumer market responses.
These findings are very important and establish the foundation for the marketing literature on the topic of cultured meat. The negative correlation between age and market responses was once again confirmed. The research also, based on the literature focused on the elderly, was able to find an effective message in increasing the propensity to try and buy cultured meat among older consumers who are notoriously more reluctant to change (Carstensen et al., 1999).

Managerial implications

This study also offers significant implications for businesses in the act of sponsoring cultured meat when it hits the mass market. Management will have to emphasize the positive effects on the environment and on the quality of life of the animals because it has been shown that focusing on these two topics increases intention to try cultured meat.
Moreover, when dealing with older consumers, it would be better to try to focus the communication exclusively on the beneficial effects that the animals would gain rather than on the environmental ones. It remains however preferable to market this meat to younger individuals as there is a strong negative correlation between age and market responses. Moreover, I would like to point out that this was the first research in the field of marketing on cultured meat and that the sector is still in full development, which

means that a good entrepreneur will have to take into account all the new trends and issues that will appear as research on this product advances and as it begins to appear on supermarket shelves.

Limitations and future research

This study also has several limitations. In terms of methodology, snowball sampling was used in this research, so this research's sample remains non-probabilistic (Gabor, 2007). Even the mode of delivering questionnaires totally online could bring biases of various kinds (Andrade, 2020) including the fact that respondents, being accustomed to technology, are also more open to novelty (Evans & Mathur, 2005). Another limitation lies in the fact that, for the sake of comprehension, the manipulated messages employed in the questionnaire were verbose and repeated. In the future, more immediate communication that would result from the live verbal delivery of the message could be used. Other future studies could focus on visual stimuli to be used to better promote cultured meat. Such research, would enjoy a strong literature base as research on visual stimuli on food (Campo et al., 2017) (Spence, 2015) and also eco-friendly messages and packaging abound (Koenig-Lewis et al., 2014) (Magnier & Schoormans, 2015). Do not underestimate the use of images with cute animals as cuteness has surprisingly been little studied so far and is capable, especially in social networks, to generate a lot of engagement.

Conclusion

In conclusion, the study answered the defined research questions and provided, albeit with various limitations, multiple insights for marketing research and practice in the field of cultured meat since its entry in the market is expected in 3-5 years (De Marco, 2021).

In particular, this study has made it possible to demonstrate that communication based on the benefits that the consumption of cultured meat brings to the environment and animals generates better market responses than a message based on taste and nutritional qualities. In addition, it was seen that in the older public, which is not surprisingly more reluctant to try and buy cultured meat, a message based on the protection of animals is more effective than the other two taken into consideration.

It was then seen that a promotion carried out with negative framing, generates high levels of guilt which in turn mediates the relationship between framing and purchase intention.

In a dramatic era where the effects of global warming are under everyone's eyes, cultured meat could help mankind reduce CO2 emissions and the exploitation of energy, water and soil resulting from intensive farming, especially beef.

The hope is that this study will be followed by many others and that it will provide interesting ideas to enrich the literary corpus on the subject.