UNIVERSIDADE CATÓLICA PORTUGUESA

MODELLING CONSUMER ACCEPTANCE OF CULTURED MEAT

Dissertation submitted to Universidade Católica Portuguesa to obtain a Master's Degree in Psychology in Business and Economics

By

Elena zu Schleswig-Holstein

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Abstract

Livestock production causes multiple global problems, including its contribution to climate change. One emerging food production technology that aims to mitigate such negative impacts by reducing livestock production, is producing lab grown meat or cultured meat (CM). As for any emerging technology for novel foods production, next to technical and regulatory challenges, companies developing CM will also have to deal with issues of consumer acceptance.

Previous research on novel foods produced with emerging technologies identified three categories of consumer acceptance predictors: Product-related factors, psychological factors and external factors. As variables representing all of these categories are often not included together in existing models on consumer acceptance of CM (e.g., familiarity and subjective norm), our study aimed to replicate and extend a widely cited one by Siegrist and Hartmann (2020b). Using an online survey with 245 participants, results showed that the original model replication was not successful due to multicollinearity, although some predictors of consumer acceptance of CM were confirmed. Trust in the food industry, familiarity with CM and subjective norm regarding CM consumption, were found to be positively correlated with acceptance, while food neophobia and disgust evoked by CM were found to negatively predict CM acceptance. Disgust sensitivity, perceived naturalness of CM, perceived benefits of CM and attitude towards nature were found to be non-significant predictors of consumer acceptance of CM. From this, implications for future research and CM marketing are discussed.

Resumo

A produção pecuária causa múltiplos problemas globais, incluindo ao nível das alterações climáticas. Uma tecnologia alimentar emergente que pretende mitigar esses impactos negativos, reduzindo a produção pecuária é a carne cultivada em laboratório (CC). A CC é a carne produzida em laboratório. Tal como para novos alimentos, a par dos desafios técnicos e regulatórios, as empresas que desenvolvem produtos de CC também terão de lidar com questões de aceitação pelo consumidor.

Investigações anteriores sobre novos alimentos produzidos com tecnologias emergentes, identificaram três categorias de preditores da aceitação do consumidor: Factores relacionados com o produto, factores psicológicos e factores externos. Dado que variáveis que representem todas estas categorias não são frequentemente incluídas juntas nos modelos existentes sobre aceitação de CC, o nosso estudo teve como objetivo replicar e alargar um modelo muito citado de Siegrist and Hartmann (2020b). Com base num inquérito online com 245 participantes, os resultados mostraram que a replicação do modelo original não foi bem sucedida devido à multicolinearidade mas ainda assim foram identificados alguns preditores da aceitação da CC. A confiança na indústria alimentar, a familiaridade com a CC e a norma subjectiva relativa à CC, demonstraram correlacionarem-se positivamente com a aceitação, enquanto a neofobia alimentar e a repugnância evocada pela CC foram identificadas como predizendo negativamente a aceitação da CC. A sensibilidade à repugnância , a perceção da CC enquanto algo natural, os benefícios percebidos da CC e a atitude para com a natureza, foram identificadas como preditores não significativos da aceitação da CC pelo consumidor. A partir disto, são discutidas implicações para investigação futura e marketing da CC.

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Chapter I: Introduction

Livestock production is associated with various major global problems. 26% of global land area is used for livestock production, thereby contributing to deforestation, land degradation and loss of biodiversity (Sakadevan & Nguyen, 2017). About 50% of global biomass produced is feed to animals (Herrero et al., 2013), food that could be allocated to human nutrition to reduce world hunger (Schmidinger et al., 2021). Livestock production is estimated to account for 9-17% of global anthropogenic greenhouse gas (GHG) emissions (Bellarby et al., 2013; Caro et al., 2014). As a result of population growth, mainly in developing countries, the demand for meat is predicted to grow by 73% by 2050 (FAO, 2011).

One way to reduce livestock production and therewith mitigate its negative consequences is to offer consumers meat alternatives. In recent years, a market for meat alternatives has developed. Multiple companies focus on developing meat alternatives such as plant- and insect-based meat analogues. Yet another novel and promising alternative to conventional meat is cultured meat (CM). CM is created by taking a few muscle cells from the muscle tissue of a living animal which are then artificially grown and developed into muscle cells. The taste and texture of CM are comparable with conventional meat (Post, 2012). Compared with conventional meat, CM has certain advantages such as that the production of CM will require less land than conventional meat (Tuomisto, Teixeira de Mattos & Joost, 2011), involves less use of antibiotics (Bhat et al., 2015) and will sharply reduce animal suffering.

In other regards, CM is still debated (Hocquette, 2016). Since the technologies underlying CM are still under development and not yet available in mass production, all claims about the sustainability of CM indicators should be considered cautiously (Tuomisto et al., 2014). Particularly the sources of energy that will be used to produce CM will determine the amount of GHGs emitted during the production of CM (Chriki & Hocquette, 2020). If fossil energies are used, the production of conventional meat might generate less GHGs than CM. If renewable energies are used, cultured meat production is likely to emit less GHGs. Additionally, the long-term health consequences are not known. Due to the fast multiplication, some forms of dysregulation as in cancer cells are likely to occur (Chriki & Hocquette, 2020). Another concern are the ethics of CM. It may, for example, be perceived as disrespectful to nature and may be perceived as one step towards

cannibalism (Schaefer & Savulescu). The use of fetal bovine serum as a growth medium to produce CM is an additional ethical consideration (Post & Hocquette, 2017). However, research already aims to develop plant-based substitutes for the serum (Kolkmann et al., 2020).

Although the first CM burger had been publicly cooked and eaten in April 2013 (Ghosh, 2013) and in December 2020, the Singapore Food Agency was the first to approve lab-grown chicken nuggets (The Guardian, 2020), CM is still not widely available to the general population. Until this occurs, CM companies will have to overcome further challenges. First, they will have to improve the technology itself, resulting in better quality and lower costs. Second, to make CM publicly available CM companies will have to deal with regulatory issues. Third, companies have to gain consumer acceptance (Post et al., 2020). Given the expected commercialisation of CM and the widespread rejection of conceptually comparable food technology such as genetically modified foods (Vlontzos & Duquenne, 2016), there is therefore a need for a better understanding of consumer acceptance of novel food technologies and CM specifically.

The findings on how CM will be received by consumers are mixed. In one of the earlier studies on consumer acceptance of CM, only 25% of participants reported willingness to try CM (Verbeke, Sans, & van Loo, 2015). In a US sample, it was found that 65.3% were willing to try CM and 32.6% willing to eat it regularly (Wilks & Phillips, 2017). Other research found that 39.3% of Belgian consumers would be willing to buy CM (Bryant & Sanctorum, 2021), while 54% of an Italian sample (Mancini & Antonioli, 2019) and 57% of a German sample said they would try CM (Weinrich et al., 2020). More recently a study found high levels of acceptance with 80% of US and UK consumers being at least somewhat or moderately likely to try CM. In this same study, younger generations were even more likely to try CM, with 88% of Gen Z participants reporting to be at least somewhat open trying CM, 85% of Millennials, 77% of Gen X and 72% of Baby Boomers (Szejda et al., 2021).

This heterogeneity in CM acceptance depends on various factors. Framing was found to be one factor influencing consumer acceptance (Bryant & Dillard, 2019). Specifically, when comparing a “societal benefit” frame with a “high tech” and “same as meat” frames, the “high tech” frame generated significantly more negative attitudes towards CM. Additional variation can result for example from socio-demographic characteristics and

political orientation of the population under investigation (Bryant et al., 2019). Younger people (vs. older people), men (vs. women) and more liberal (vs. conservative) were found to be more open towards CM (Szejda et al., 2021; Wilks & Phillips, 2017). People with higher education levels of education were found to be more likely to accept CM (Mancini & Antonioli, 2019). Also, psychological variables such as familiarity with CM was associated with higher acceptance (Bryant et al., 2019; Mancini & Antonioli, 2019), while socio-economic factors such as price also seem to have a role, given that participants reported higher preference for CM when its price was lower and its perceived market share was higher (Slade, 2018).

Since the success of CM strongly depends on consumer acceptance, the current study examined which factors determine whether consumers will accept CM. The current study therefore first reviewed a general framework about consumer acceptance for novel foods and an existing model that integrated factors that determine consumer acceptance of CM. By combining these two models, a collection of factors that potentially determine the acceptance of CM was derived and tested.

Chapter II: Modelling consumer acceptance of novel foods

In his theoretical framework of acceptance of novel foods Siegrist (2008) distinguishes between product-related factors, psychological factors and external attributes. Product-related drivers of acceptance are characteristics of the product, what consumers associated with the product and cognitions such as perceived naturalness and perceived risks and benefits. Psychological factors determining consumer acceptance are personal characteristics such as food neophobia and emotional reactions to the product, such as disgust. External attributes are social and cultural cues associated with a novel food that consumers rely on to form their opinion.

This framework by Siegrist's (2008) received up-to-date support and slight additions from Onwezen et al.'s (2020) systematic review on consumer acceptance of alternative proteins, including pulses, algae, insects, plant-based meat alternatives, and cultured meat. In the category of product-related predictors of consumer acceptance, in addition to food motivations, the framework was complemented by familiarity with the products as driver of acceptance (Bryant et al., 2019; Mancini & Antonioli, 2019). Concerning psychological predictors of consumer acceptance, in line with Siegrist (2008), Onwezen et al. (2020) reviewed literature that provides additional support for food neophobia and disgust as key

drivers of consumer acceptance of novel foods (Siegrist & Hartmann, 2020b). Regarding external attributes, they examined research emphasizing the importance of trust (Siegrist & Hartmann, 2020b) and the social and cultural environment (Jensen & Lieberoth, 2019) as predictors of consumer acceptance of alternative proteins.

Concerning CM specifically, Onwezen and colleagues (2020) concluded that the most relevant drivers of consumer acceptance were motives of taste and the environment, attitudes, disgust and food neophobia, trust and naturalness. More specific research on consumer acceptance of CM will be reviewed in the following section.

Chapter III: Modelling consumer acceptance of cultured meat

Siegrist & Hartmann (2020b) tested a model including disgust as personality trait and in relation with CM, perceived naturalness, trust and food neophobia as predictors of cultured meat acceptance in ten countries (Figure 1). The model predicted 53% of variance in consumer acceptance. In terms of Siegrist's (2008) factors influencing public acceptance of innovative food technologies and products, Siegrist and Hartmann (2020b) mainly covered psychological predictors. Product-related and external predictors of acceptance, as suggested by Siegrist (2008) and Onwezen et al. (2020), are considered only to a limited extend, namely by including perceived naturalness and trust. Regarding product-related aspects, the model lacks the predictors food motivations and familiarity with CM, regarding psychological predictors the model lacks an attitudinal component and regarding external variables, the model lacks social and cultural aspects.

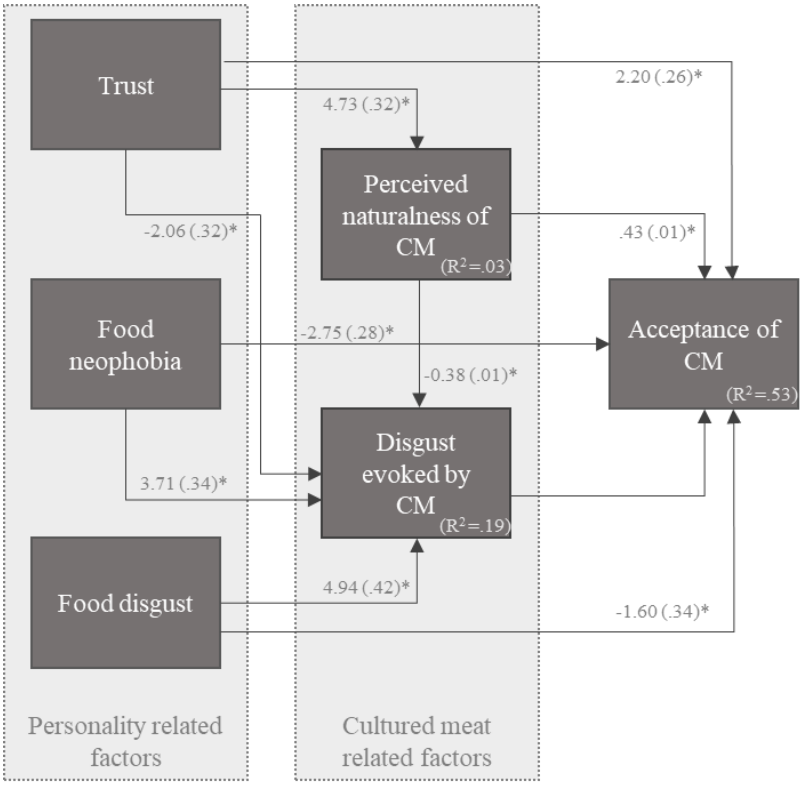

Figure 1 – *Reproduced from Siegrist & Hartmann (2020b) (*p < .01)*

Aiming to gain a profound understanding of consumer acceptance of CM, the current study develops and tests a more comprehensive model with factors determining consumer acceptance of CM. Therefore, the model by Siegrist and Hartmann (2020b) is replicated and extended by additional variables, representing the three main categories of predictors identified in the literature: product-related, psychological and external. Next to perceived naturalness and in line with Siegrist's (2008) framework and CM acceptance specific research, two product-related factors, namely perceived risks and benefits (Wilks et al., 2019) and familiarity (Bryant & Dillard, 2019; Mancini & Antonioli, 2019) were added. The psychological predictors were complemented by a measure of attitude towards the environment (Ruzgys & Pickering, 2020; Shen & Chen, 2020). To cover the social aspect within the category of external drivers of acceptance, a measure of subjective norm was included (Cook et al., 2002; Jensen & Lieberoth, 2019; Kim et al., 2014; Rivis & Sheeran, 2003). Thereby, the current study aimed to establish a profound understanding for the factors relevant to consumer acceptance of CM. The next section reviews more detailed evidence for the predictive power of the selected factors for CM acceptance of the respective product-related, psychological and external variables in more detail.

Product-related factors	Psychological factors	External factors
• Perceived risks and benefits • Perceived naturalness • Familiarity with CM	• Food neophobia • Disgust sensitivity • Disgust evoked by CM • Attitude towards the environment	• Trust • Subjective norm

Table 1 – *Overview of product-related, psychological and external factors*

Chapter IV: Research framework and hypotheses development

4.1 Product-related predictors of acceptance

4.1.1 Perceived benefits

Multiple frameworks that theorize consumer perception of novel foods suggest that perceived risks and benefits of the novel product determine consumer acceptance (Onwezen et al., 2020; Ronteltap et al., 2007; Siegrist, 2008). This is in line with research in the field of consumer acceptance of gene modified foods (Costa-Font & Gil, 2009; Prati et al., 2012; Rodríguez-Entrena et al., 2013) and insect-based novel foods (Hwang et al., 2020a; Koning et al., 2020). Accordingly, Weinrich et al. (2020) found a positive association between perceived ethical advantages and intention to try, consume and promote CM and Wilks et al. (2019) found perceptions of benefits of CM to be positively correlated with willingness to eat CM.

4.1.2 Perceived naturalness

Perceived naturalness is a central barrier for consumer acceptance of CM. Unlike other concerns, perceived naturalness had been reported as objection against CM across various cultures (Laestadius & Caldwell, 2015). Qualitative research found that CM evokes associations of "playing God" and of tampering with nature (Marcu et al., 2015) which is the opposite of a natural appeal. Accordingly, perceived naturalness was found to be positively associated with CM acceptance (Bryant et al., 2019; Siegrist & Hartmann, 2020b; Siegrist, Sütterlin, & Hartmann, 2018). One study found that naturalness did not determine willingness to eat CM. However, this study did not measure perceived naturalness of CM but a naturalness bias (Wilks et al., 2019) which is a preference for things that are natural.

4.1.3 Familiarity

Familiarity with a type of food increases certainty about the product and reduces worries about the safety of the food (Aldridge et al., 2009). Accordingly, higher familiarity with CM was associated with higher acceptance of CM (Bryant et al., 2019; Mancini & Antonioli, 2019). This insight finds further support in a hamburger tasting study where both tasted hamburgers consisted of conventional meat, but one was labelled as CM and the other as conventional meat. Different information about CM and the tasting experience itself increased acceptance of CM. The best predictor of acceptance, however, was prior awareness of CM, hence familiarity with it (Rolland et al., 2020).

4.2 Psychological predictors of acceptance

4.2.1 Food Neophobia

Food neophobia is the tendency to reject unfamiliar foods. This personality trait is thought to protect humans from unknown foods that are possibly poisonous (Rozin & Vollmecke, 1986). People with high food technology neophobia were found to be less accepting towards novel food technology (Vidigal et al., 2015). Food neophobia was also found to predict acceptance of CM specifically (Dupont & Fiebelkorn, 2020; Hwang et al., 2020b; Siegrist & Hartmann, 2020b; Wilks et al., 2019).

Additionally, research found an interaction effect between neophobia and familiarity regarding willingness to try novel foods. Participants evaluated familiar foods more positively than unfamiliar foods. For familiar foods, the reactions of participants with high and low levels of neophobia were similar but differed for unfamiliar foods. Participants with higher levels of neophobia made more negative evaluations of unfamiliar foods (Raudenbush & Frank, 1999). Other research found a similar effect: Food neophobia was found to be strongly associated with negative reactions to novel foods, but not with reactions to familiar foods (Pliner & Salvy, 2006). Another study found additional support for an interaction effect between familiarity and neophobia regarding willingness to try novel foods. In that case, familiarity was measured in terms of a previous tasting experience of the presented novel foods. The study found that for novel foods, a positive previous tasting experience and thus, familiarity with a novel food, is positively associated with willingness to try novel foods in people with high levels of food neophobia. The effect of tasting was smaller for individuals with lower levels of neophobia. For familiar

foods, no significant association between neophobia and willingness to try was found (Tuorila et al., 2001).

4.2.2 Food disgust sensitivity

Food disgust sensitivity refers to people's sensitivity to react with disgust to certain food-related stimuli. It is a character trait that differs among people and influences people's eating preferences, habits and behaviours (Egolf et al., 2018). Food disgust sensitivity was found to be positively associated with disgust evoked by cultured meat and negatively associated with acceptance of CM (Siegrist & Hartmann, 2020b). One study found a non-significant association between disgust sensitivity and CM acceptance (Wilks et al., 2019). This result can be explained by the way disgust sensitivity is measured. If measured only with items referring to food, a significant association was found (Siegrist & Hartmann, 2020b), while when measured with items that go beyond mere food-related topics (Olatunji et al., 2007), no significant results were found (Wilks et al., 2019). The way the current study measures food disgust sensitivity will be further detailed in the methodology section.

4.2.3 Disgust evoked by CM

Disgust evoked by CM is another major challenge to consumer acceptance of CM. As food neophobia, from an evolutionary perspective, disgust is an important reaction to protect the body from consuming substances that could harm the body (Heath et al., 2001) and is therefore considered a part of the so-called behavioural immune system. Accordingly, participants of focus groups in the UK, Belgium and Portugal expressed disgust when first hearing about CM (Verbeke, Marcu, et al., 2015). These initial reactions were complemented by findings of quantitative research. Disgust was found to be negatively associated with CM acceptance (Egolf et al., 2019; Siegrist & Hartmann, 2020b).

4.2.4 Attitude towards the environment

Attitudes towards novel food technologies were found to be embedded in a system of more general attitudes, especially in attitudes towards nature (Grunert et al., 2003). Research also found a growing concern about the environmental impact of meat as one of the main reasons why individuals would be motivated to not eat meat (Bryant & Sanctorum, 2021). In line with these findings, other studies found a positive association

between environmental concern and CM acceptance (Ruzgys & Pickering, 2020; Shen & Chen, 2020).

4.3 External predictors of acceptance

4.3.1. Trust

Consumers tend to have very limited knowledge of novel food technologies such as gene technology (Macoubrie, 2004) and CM (Weinrich et al., 2020; Zhang et al., 2020). This lack of knowledge makes it challenging for consumers to evaluate the risks and benefits of novel foods. One way to cope with uncertainty is to rely on heuristics. When using heuristics to make decisions under uncertainty, consumers identify other cues in the environment that guide their judgements, thereby reducing the complexity of decisions (Gigerenzer & Gaissmaier, 2011; Kahneman et al., 1982). One commonly used heuristic with regards to CM is to rely on one's trust in relevant institutions. When evaluating CM, people rely on their trust in for example stakeholders in the food industry (Siegrist, 2008; Siegrist & Hartmann, 2020a). The significance of trust as a predictor for consumer acceptance depends on how trust is measured: General distrust in science was not found to be a significant predictor for acceptance of CM (Wilks et al., 2019); Trust in the food industry, however, was found to significantly predict acceptance of CM (Bryant & Sanctorum, 2021; Siegrist & Hartmann, 2020b; Siegrist, Hübner, & Hartmann, 2018). More details on the measurement of trust in this study will be discussed in the methods section.

4.3.2. Subjective norm

Subjective norm refers to beliefs about whether others think you should or should not perform a behaviour such as consuming CM. A meta-analysis found that others' attitudes and expected behaviour are important predictors for behavioural intentions particularly regarding health risk behaviours (Rivis & Sheeran, 2003). A study on the acceptance of another novel food technology, namely nutrigenomics-based personalised nutrition, identified subjective norm as the second-most important construct after cost-benefit assessments to determine consumer acceptance (Ronteltap et al., 2008). Additionally, Cook and colleagues (2002) concluded that disapproval or approval from family and friends influences individuals in their attitude and intention to purchase GM foods. Kim et al. (2014) found further support for a positive association between subjective norm and behavioural intentions to eat GM foods. Findings from the field of insect-based food also

suggest that perceived social norms are key predictors to willingness to eat insects (Jensen & Lieberoth, 2019). Although no published research has established a link between subjective norm and CM acceptance in particular, subjective norm will be included in the extended model.

4.4 Hypothesis

Given the reviewed literature, the current study had three goals. First, the study aimed to replicate the model introduced by Siegrist and Hartmann (2020b) using a stepwise multiple regression with interaction effect. Second, the study tested an extended version of the replicated model by Siegrist and Hartmann (2020b) with four additional predictors of consumer acceptance of CM, namely perceived benefits, familiarity with CM, attitude towards nature and subjective norm, representing the three main categories of predictors: product-related, psychological and external. Additionally, the study included interaction effects between trust and perceived benefits, and neophobia and familiarity as predictors of consumer acceptance of CM. Third, the original model was compared with the extended model regarding its explanatory power for consumer acceptance of CM.

Chapter V: Method

5.1 Participants

321 responses were collected through an online survey available through the Qualtrics platform. After excluding incomplete responses and responses by participants who failed an attention check, the study achieved a final number of 260 participants. Prior to the data collection, power analysis revealed that with an expected effect size of .10 to obtain a statistical power of 95% with nine predictor variables, a minimum sample size of 245 participants was needed. This goal was therefore achieved.

The participants were recruited through a social media convenience sampling process and on platforms where surveys are exchanged, namely Survey Swap and Survey Circle. The sample consisted of 42.1% males, 56.7% females and 0.8% participants who reported their gender as diverse. The mean age was 29.64 years, with strong positive skewness. 69.3% of participants were from Germany, 6.1% from Portugal and the remaining 24.6% of participants were from 25 other countries from around the world.

Variables	Categories	Values
Gender	Male	110 (42.10%)
	Female	148 (56.70%)
	Other	2 (0.80%)
Age	12-71 years	M = 29.63; SD = 11.36
Educational level	No education	0 (0%)
	Primary school	0 (0%)
	Some high school	3 (1.10%)
	Completed high school	45 (17.20)
	Technical qualification or trade certificate	6 (2.40%)
	College/undergraduate degree	113 (43.30%)
	Postgraduate degree	93 (35.60%)
Net household income	Less than 1,000€	73 (28.00%)
	1,000-2,5000€	76 (29.10%)
	2,5000-4,000€	48 (18.40%)
	More than 4,000€	63 (24.10%)
Nationality	German	181 (69.60%)
	Portuguese	16 (6.20%)
	Other	63 (24.20%)
Works in the meat industry	Yes	12 (4.60%)
	No	248 (95.40%)
Has family or close friends working in the meat industry	Yes	26 (10.00%)
	No	234 (90%)
Meals with meat per week	Never	48 (18.50%)
	1-2 meals	69 (26.50%)
	3-4 meals	70 (26.90%)
	5 and more	73 (28.70%)
Meals with meat substitutes per week	Never	88 (33.80%)
	1-2 meals	107 (41.20%)
	3-4 meals	42 (16.20%)
	5 and more	23 (8.80%)

Table 2 – *Socio-demographic and socio-economic characterization of participants (n=260)*

5.2 Instrument

The data was collected using an online questionnaire consisting of psychometrically validated scales in English measuring attitude towards the environment, trust in the food

industry, food neophobia, food disgust sensitivity, familiarity with CM, perceived risks and benefits of CM, perceived naturalness of CM, disgust evoked by CM, subjective norm of CM acceptance, and consumer acceptance of CM. The respective scales are introduced below in the order as they were presented to the participants.

5.2.1 Attitude towards the environment

Attitude towards the environment was measured using the New Environmental Paradigm (NEP) Scale (Dunlap et al., 2000). The NEP Scale is the most widely used measure for environmental attitudes (Hawcroft & Milfont, 2010). Participants were asked to respond on a 5-point rating scale ranging from 1 (strongly disagree) to 5 (strongly agree) to 15 questions like "Plants and animals have as much right as humans to exist" or "Humans were meant to rule over the rest of nature". Items 2, 4, 6, 8, 10, 12 and 14 were reverse coded. Low scores indicate an anthropocentric orientation and high NEP scores indicated an ecocentric orientation. While the original's Cronbach's alpha was .83, in the current study the value was .77.

5.2.2 Trust

Trust in stakeholders in the food sector was measured using four items as used in Siegrist and Hartmann (2020b). Participants were asked whether they trusted the food industry, food retailers and food scientists, and whether they think one can rely on governmental controls in the food sector. They responded on a 6-point rating scale ranging from 1 (strongly disagree) to 6 (strongly agree). High scores indicated a high level of trust. While the original's Cronbach's alpha ranged between .82 and .89, in the current study the value was .78.

5.2.3 Food Neophobia

Food neophobia was measured using the ten items introduced by Pliner and Hobden (1992) including items like "I do not trust new foods" and "At dinner parties, I will try a new food". Participants responded on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Items 1, 3, 5, 9 and 10 were reverse coded. High scores indicated high levels of food neophobia. While the original's Cronbach's alpha was .88, in the current study the value was .83.

5.2.4 Food disgust sensitivity

Food disgust sensitivity was measured using the 8-item short version of the food disgust sensitivity scale (Ammann et al., 2018). On a 6-point rating scale from 1 (not disgusting at all) to 6 (extremely disgusting) participants were asked to report how disgusting they found eight food related situations (e.g., "To eat brown-coloured avocado pulp"). High score indicated high level of food disgust sensitivity. While the original's Cronbach's alpha was .78, in the current study the value was .71.

5.2.5 Familiarity with CM

Familiarity with CM was measured by asking participants how familiar they are with the concept of CM. They were ask to respond on a 5-point scale ranging from 1 (not familiar at all) to 5 (extremely familiar) (Bryant et al., 2019). High scores indicated high level of familiarity.

5.2.6 Consumer acceptance of CM

Consumer acceptance of CM was measured in terms of willingness to consume CM. It was measured using three items from Rolland et al. (2020). Participants were asked whether they would like to try CM, whether they would buy it when it becomes available in the supermarket and whether they would replace their current meat consumption with CM. The participants were asked to respond on a 5-point scale ranging from 1 (definitely not) to 5 (definitively yes). High scores indicate high levels of acceptance. While the original's Cronbach's alpha was .89, in the current study the value was .87.

5.2.7 Perceived risks and benefits

Perceived risks and benefits were measured using four items as used by Wilks et al. (2019). Out of the original six items, two were excluded because perceived naturalness and disgust are measured as independent predictors. Participants were asked how healthy, environmentally friendly, ethical and tasty they thought CM was compared with farmed meat. They responded on a 5-point scale ranging from 1 (not at all) to 5 (absolutely). High scores indicate high perceived benefits. The original's Cronbach's alpha was .87.

The reduced scale for perceived risks and benefits as used in the current study had an unsatisfactory Cronbach's alpha of .22. To improve the psychometric characteristics of the scale and based on the alpha value results if an item was deleted, item 2 was excluded. Excluding item 2 makes conceptual sense because items 1, 3 and 4 refer to concepts related

to the participant him/herself, namely health, subjective ethical status of CM and taste, while item 2 asks about an aspect of CM that is not directly related to the self, namely how environmentally friendly CM is compared to farmed meat. The exclusion of this item results in a Cronbach's alpha of .651. Although not ideal, but considering the small number of items this Cronbach's alpha can be considered adequate (Taber, 2018; van Griethuijsen et al., 2020).

5.2.8 Perceived naturalness

Following Siegrist and Hartmann (2020b), participants were asked the question "How artificial/natural do you assess cultured meat to be?". They answered by moving a slider with possible responses ranging from "artificial" to "natural". The response was translated to numbers ranging from 0 to 100. When moving the slider, however, the participant could not see any numbers. High scores indicate high levels of perceived naturalness.

5.2.9 Disgust evoked by CM

In line with Siegrist and Hartmann's (2020b) measurement, participants were asked the question "Do you perceive cultured meat as disgusting?". Again, they answered by moving a slider with possible responses ranging from "not disgusting at all" to "extremely disgusting". The response was translated to numbers ranging from 0 to 100. When moving the slider, however, the participant could not see any numbers. High scores indicated high level of disgust evoked by CM.

5.2.10. Subjective Norm

Subjective norm was measured using adapted versions of the three questions by Spence & Townsend (2006) that they originally used to measure subjective norm regarding GM foods. In the adapted questions participants were for example asked whether the people in their lives whose opinions they value would not mind if the meat they ate was cultured meat. Participants responded on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). High scores indicate that the participant thinks that others think he or she should consume CM. While the original's Cronbach's alpha was not reported in numbers but only as having "reasonable to good levels of internal consistency" (Spence & Townsend, 2006), in the current study Cronbach's alpha was .87.

5.2.11 Control variables

In addition to assessing age, gender, education, income, and nationality to characterize the participants socio-demographic and socio-economic profile, control variables were also included. The participants were asked whether he or she worked in the meat industry or had family members working in the meat industry. The participants were further asked about their frequency of meat intake and meat substitutes intake per week.

5.3 Procedure

5.3.1 Data collection

Before starting the survey, participants were informed that their participation was voluntary, that they could stop at any time and that their data would be treated confidentially. They were informed that by continuing the survey, they indicated their agreement and understanding.

After responding to the first sets of items, after the scale for food disgust sensitivity, the participants were made familiar with the concept of CM through the following description: “Cultured meat is created by taking a few muscle cells from the muscle tissue of a living animal. The cells are then artificially grown and developed into muscle cells in a laboratory. Cultured meat is expected to be commercially available within the next years.” This was followed by the remaining sets of items.

5.3.2 Data analysis

All analyses were performed in SPSS version 26. Particularly with regard to testing regression models in SPSS, many researchers use the PROCESS macro (Hayes, 2017) to calculate path models as was used to analyse the model that the current study aims to extend (Siegrist & Hartmann, 2020b). However, there is criticism on such path models calculated with PROCESS (Rohrer et al., 2021). The author of the PROCESS macro, Hayes (2017), introduced regression analysis rather than causal inference. When, however, testing path models applied to observational data, studies often make causal inferences based on observational data. This is questionable, unless making many strong and explicit assumptions, such as accounting for confounding variables, for reverse causality and for the functional forms of effects between variables (of which mostly is little known about). If those assumptions are violated, the results can hardly be interpreted as they become be a mix of spurious and causal associations (Rohrer et al., 2021; Thoemmes, 2015). The

assumptions that would have to be made for the current study with nine predictors of consumer acceptance of CM and association between the predictors would add up so that coming to a robust conclusion would become hardly realistic. Considering these limitations of the PROCESS macro, the current study does not use mediation analysis, but analyses the data using stepwise linear regression with interaction effects representing the mediations in Siegrist and Hartmann (2020b). To ensure validity, the sample was bootstrapped 1000 times (default value in SPSS).

Chapter VI: Results

6.1 Descriptive statistics

Participants scored above the midpoint for consumer acceptance of CM (M = 3.46; SD = 1.12), indicating that they are more likely to try or buy CM or might even replace their current meat consumption with CM than that they would not. Male participants (M = 3.80; SD = .97) reported .55 points more CM acceptance than female participants (M = 3.24; SD = 1.16; p = 0.006). Older participants reported lower levels of acceptance (b = .211; p = .002). Education did not correlate with CM acceptance (b = 0.039; p = .56). Participants with higher incomes were more likely to accept CM than participants with lower incomes (b = .153; p = .044). Meat consumption (b = .040; p = .522) and meat substitute consumption (b = .034; p = .587) did not correlate significantly with CM acceptance. Participants that worked in the meat industry (M = 2.83; SD = 1.45) where 0.67 points less likely to accept CM than participants that did not work in the meat industry (M = 3.50; SD = 1.10; p = .046). However, it should be mentioned that only 12 out of 260 participants (4.6%) worked in the meat industry. Whether participants had family or friends working in the meat industry (M = 3.27; SD = 1.41) or not (M = 3.49; SD =1.09) did not make a difference in CM acceptance (p = .453). Again, it should be noted that only 26 out of 260 participants (10%) had family or friends working in the meat industry.

Moreover, on a scale between 1-6, participants reported a medium average level of 3.36 (SD = .88) for disgust sensitivity and an average level of 3.09 (SD = .95) for trust in the food industry, representing a slight tendency towards distrust in the food industry. On a scale from 1-5, participants reported a low level of 2.43 (SD = .66) for food neophobia and medium-high level of 3.78 (SD = .52) for attitude towards the environment. On a scale from 1-5, participants reported a medium level of 3.17 (SD = .74) for perceived benefits indicating that they perceive CM as slightly more beneficial than farmed meat and a

medium level of 2.81 (SD = 1.24) for familiarity, indicating that the participants were slightly to moderately familiar with CM.

On a scale from 1-100, participants reported a low level of perceived naturalness of CM of 30.93 (SD = 25.46) and a low level of disgust evoked by CM of 29.25 (SD = 31.41). On a scale from 1-7, they reported a medium level of 4.57 (SD = 1.21) for subjective norm, indicating that on average, they would somewhat agree that their social environment would accept CM.

Measure	*Mean*	*Std. Deviation*	*Scale Endpoints*	*Cronbach's alpha*
CM acceptance	3.46	1.12	1 – 5	.87
Trust	3.09	0.95	1 – 6	.78
Food neophobia	2.43	0.66	1 – 5	.83
Disgust sensitivity	3.36	0.88	1 – 6	.71
Perceived naturalness	30.93	25.46	1 – 100	n.a.
Disgust evoked by CM	29.25	31.41	1 – 100	n.a.
Perceived benefits	3.17	0.74	1 – 5	.65
Familiarity	2.81	1.24	1 – 5	n.a.
Attitude towards the environment	3.78	0.52	1 – 5	.77
Subjective norm	4.57	1.21	1 – 7	.77

Table 3 – *Means, standard deviations, scale endpoints and Cronbach's alphas of variables*

6.2 Hypotheses testing

6.2.1 Replication of the Siegrist and Hartmann (2020b) model

First, the current study attempted to replicate Siegrist and Hartmann's (2020b) model. Tolerance scores of less than 0.1 and variance inflation factors (VIF) greater than 10 indicated strong multicollinearity (Dormann et al., 2013) for naturalness (Tolerance = .078, VIF = 12.85), disgust evoked by CM (Tolerance = .03, VIF = 33.87) and particularly for the interaction terms, namely trust and naturalness (Tolerance 0 .07, VIF = 14.96), trust and disgust evoked by CM (Tolerance = .09, VIF = 11.31), neophobia and disgust evoked by CM (Tolerance = .04, VIF = 24.67) and disgust sensitivity and disgust evoked by CM (Tolerance = .04, VIF = 25.49).

To reduce multicollinearity among predictors, the interaction terms were excluded, leaving only the individual predictors that were introduced by Siegrist and Hartmann (2020b). Excluding the interaction effects solved the problem of multicollinearity with

tolerance scores higher than 0.1 ranging from 0.772 and 0.964 and VIFs around lower than 10 ranging from 1.037 and 1.295. Additional material to test other assumptions relevant to the model is available upon request. The model without interaction effects predicted 49,5% of the variance (adjusted R^2 =.0.495, $F(5,254) = 51.752$, $p < .000$). Because the interaction terms had to be removed for the reasons explained, the hypothesized model was refuted. In the following paragraphs, this model that was originally based on Siegrist and Hartmann (2020b) excluding the interaction terms will be referred to as the original model without interactions.

6.2.2 Extension of the Siegrist and Hartmann (2020b) model

In the second step of the analysis, the four additional predictors of consumer acceptance of CM, namely perceived benefits, familiarity with CM, attitude towards the environment and subjective norm and two interaction terms between trust and perceived benefits, and neophobia and familiarity were added to the original model without interactions in a two-step linear regression.

Again, problems of collinearity occurred for trust (Tolerance = .05, VIF = 18.36), perceived benefits (Tolerance = 0.09, VIF = 11.65), familiarity (Tolerance = 0.07, VIF = 13.99) and the interaction terms of neophobia and familiarity (Tolerance = .07, VIF = 14.69), and trust and perceived benefits (Tolerance = .03, VIF = 31.08). Excluding the interaction terms solved the problem of multicollinearity.

Trust ($\beta = .175$, $p < .000$), neophobia ($\beta = -.161$, $p = .001$), disgust evoked by CM ($\beta = -.418$, $p < .000$), familiarity ($\beta = .110$, $p = .022$) and subjective norm ($\beta = .161$, $p = .002$) were found to significantly predict consumer acceptance of CM. Disgust sensitivity ($\beta = .072$, $p = .142$), perceived naturalness ($\beta = .081$, $p = .079$), perceived benefits ($\beta = .078$, $p = .201$) and attitude towards nature ($\beta = .068$, $p = .126$) were found to be non-significant predictors of consumer acceptance of CM.

6.2.3 Model comparison

Overall, adding the extensions without interactions to the original model results in a model that explains 53.8% of variance (adjusted $R^2 = .538$, $F(6,248) = 29.045$, $p < .000$). Hence, it can be concluded that the extensions added 4.3% of explained variance of consumer acceptance of CM (Table 4).

Step and Predictor Variable	*B*	*SE B*	*β*	R^2 *Adj*	ΔR^2
Step 1				.495***	.505***
Trust	.178	.053	.151**		
Neophobia	-.316	.085	-.186***		
Disgust sensitivity	.103	.064	.081		
Naturalness	.006	.002	.128**		
Disgust evoked by CM	-.021	.002	-.579***		
Step 2				.538***	.049***
Trust	.207	.052	.175***		
Neophobia	-.273	.082	-.161**		
Disgust sensitivity	.091	.062	.072		
Naturalness	.004	.002	.081		
Disgust evoked by CM	-.015	.002	-.418***		
Perceived benefits	.118	.092	.078		
Familiarity	.100	.043	.110*		
Attitude towards the environment	.146	.095	.068		
Subjective norm	.150	.049	.161**		

*p<.05, **p<.01, ***p<.001

Table 4 – *Model summary – Two-step multiple regression: 1. Step: original model without interactions; 2. Step: extended model without interactions*

Chapter VII: Discussion

Based on the framework suggested by Siegrist (2008) on acceptance of novel foods, the current study explored three broad categories of factors that are associated with consumer acceptance of CM: product-related, psychological and external factors. Based on this general framework (Siegrist, 2008) on acceptance of novel foods, the current study aimed to first replicate and second extend Siegrist and Hartmann's (2020b) model on consumer acceptance of CM. Overall, three product-related factors, namely perceived benefits, perceived naturalness and familiarity with CM, four psychological factors, namely food neophobia, disgust sensitivity, disgust evoked by CM, attitude towards the environment and two external factors, namely trust in the food industry and subjective norm were tested. The third step was to compare the original model with the extended model regarding their explanatory power for consumer acceptance of CM.

Due to methodological considerations, the model was not replicated as a mediation model in the SPSS macro PROCESS (Hayes, 2017) as done by Siegrist and Hartmann

(2020b), but as a stepwise linear regression with interaction effects representing the mediations in the original model. It was found that the model with the original set of predictors including the interaction effects had problems of multicollinearity, which implied that the hypothesized model (variables and its relationships) was refuted. Hence, it can be concluded that in the current study, the original model was not replicated and it is worth performing additional studies in the future, with samples with diverse characteristics, to assess whether the model can be validated or refuted.

Additionally, although some factors that were previously found to be predictive of consumer acceptance of CM, some were not predictive in the current model, namely disgust sensitivity (Siegrist & Hartmann, 2020), perceived naturalness (Bryant et al., 2019; Laestadius & Caldwell, 2015; Siegrist & Hartmann, 2020b; Siegrist, Sütterlin, & Hartmann, 2018), perceived benefits (Wilks et al., 2019) and attitude towards nature (Ruzgys & Pickering, 2020; Shen & Chen, 2020).

There are multiple conceptual and methodological reasons that may explain why the original model and the predictive power of the included constructs could not be replicated. It may be that the variables that were found unpredictive of CM acceptance are in fact no predictors or only under certain conditions such as may be the case for perceived naturalness of CM. People who consider naturalness as important reported lower levels of perceived naturalness of CM, which was in turn associated with lower consumption intentions (Michel & Siegrist, 2019). In other words, people may perceive CM as unnatural, but might not consider this aspect of CM important. Hence, future research could test variables that were predictive of CM in previous studies like the study by Siegrist and Hartmann (2020b), but not in the current study, as conditional predictors, such as perceived naturalness conditioned by people's subjective importance of naturalness.

An additional explanation for why the replication of some of Siegrist's and Hartmann's (2020b) predictors was unsuccessful may be due to differences in the sample. Despite being balanced in terms of socio-economic characteristics, the current sample was dominated by young and well-educated individuals. This kind of sample may have different associations between predictor variables and consumer acceptance compared with samples of previous studies like Siegrist and Hartmann (2020b). The current sample consisted of 69.6% Germans but also 30.4% of other nationalities from around the world

who additionally differ regarding some of the variables under investigation.[1] This finding of cultural difference within the sample is in line with previous research that found that different countries display different levels of acceptance of CM and different levels on CM acceptance predictors (Siegrist & Hartmann, 2020b). The timing of the study could be yet another reason why previous findings could not be replicated. It has been found that the more people become familiar with CM and novel foods in general, the more likely they are to accept them (Aldridge et al., 2009; Bryant & Dillard, 2019; Mancini & Antonioli, 2019). Hence, the more exposure people have over time to the idea of CM, the more likely they may be to accept it. These cultural and timing aspects may be the reason for why the hypothesized predictors were not predictive of CM acceptance.

Yet another approach to explaining the unsuccessful replication would be to evaluate the different methodologies of the two studies. Despite the use of different statistical approaches because the same phenomenon is examined, the results should somewhat display a similar pattern. Since the current study had major problems with multicollinearity, it may be relevant to examine the multicollinearity levels of the model suggested by Siegrist and Hartmann (2020b). Multicollinearity may have occurred because the explanatory power of some variables overlaps and therefore captures the explanatory power of the other variables. Compared with the original set of predictors, the additional predictors were found to be better at explaining variance in consumer acceptance than some of the predictors from the original model. This can result in the observed decline in significance of the predictors from the original model.

To tackle the problem of multicollinearity future studies may choose a smaller set of variables to work with. Additionally, it would be interesting to investigate in more detail how the different tested constructs are associated and how they condition each other. This could for example be done through an experimental design with an intervention that addresses one variable (e.g., familiarity), while at the same time controlling for the other predictors. Such a design would allow to investigate how one variable changes due to a

[1] An additional analysis showed that regarding the majority of variables, the German and non-German sample did not differ except for small but significant differences in acceptance of CM with Germans (M = 3.58; SD =1.05) scoring 0.39 points significantly higher than non-Germans (M = 3.19; SD = 1.26; p = .012), familiarity with Germans (M = 2.88; SD = 1.15) being 0.24 points significantly more familiar than non-Germans (M = 2.64; SD =1.45; p < .000), disgust evoked by CM with Germans (M = 27.07; SD = 29.88) being 6.16 points significantly less disgusted than non-Germans (M = 33.23; SD =3 4.58; p = .030) and perceived benefits with Germans (M = 3.22; SD = 0.65) perceiving CM as 0.18 points significantly more beneficial than non-Germans (M = 3.05; SD = 0.92; p < .000) .

change in another and would allow for causal inferences. Overall, considering the differences in results of Siegrist's and Hartmann's (2020b) and the current study, further research is needed to gain a better understanding of these kinds of models and associations between predictors.

The third step was to compare the original model with the extended model without interaction. The added predictors in the model increased the explanatory power of consumer acceptance of CM by 4.3% to 53.8%. Out of the nine tested constructs, five were found to be predictors of consumer acceptance of CM. As expected, trust in the food industry (Bryant & Sanctorum, 2021; Siegrist & Hartmann, 2020b; Siegrist, Hübner, & Hartmann, 2018), familiarity with CM (Bryant et al., 2019; Mancini & Antonioli, 2019, Rolland et al., 2020) and subjective norm (Cook et al., 2002; Kim et al., 2014; Jensen & Lieberoth, 2019) were positively correlated with acceptance. As also hypothesized, food neophobia (Dupont & Fiebelkorn, 2020; Hwang et al., 2020b; Siegrist & Hartmann, 2020b; Wilks et al., 2019) and disgust evoked by CM (Egolf et al., 2019; Siegrist & Hartmann, 2020b) were correlated negatively with consumer acceptance of CM. This shows that acceptance is predicted by variables from each of the three proposed categories, namely product-related, psychological and external factors. Implications of these results are proposed in the final remarks section.

Some limitations of the current study need to be addressed. As in all studies investigating consumer acceptance of novel products that are not yet known to the broad public, a product description had to be provided. Such a product description can already influence the way people perceive the novel product (Bryant & Dillard, 2019; Siegrist, Sütterlin, & Hartmann, 2018). Hence, in order to keep the effect of the product description on the levels of acceptance low, the current study used a neutral description of CM.

As mentioned before, it should also be noted that the sample was not representative of the average German population. Thus, the results should be considered with caution. Future research should verify the results with a representative sample. Furthermore, acceptance of CM was reported as intention and may therefore deviate from actual behaviour. Although people reported that they would try CM in the current study, when actually facing real CM, they may decline to try it or the other way around. Hence, the levels of acceptance reported in the current study should be regarded cautiously. Once CM is available in supermarkets, actual behaviour should be studied. Additionally, future

research is needed to be able to draw causal conclusions about interventions to enhance consumer acceptance of CM and other novel foods.

Chapter VIII: Final Remarks

Food choices, particularly the choice to consume meat, have a strong impact on major global problems such as land use, loss of biodiversity and GHG emissions (Bellarby et al., 2013; Caro et al., 2014; Westhoek et al., 2014). One promising alternative to conventional meat is CM. In December 2020, the Singapore Food Agency was the first to approve lab-grown chicken nuggets (The Guardian, 2020). Multiple companies around the world are currently developing prototypes of cultured meat products. Next to technological and regulatory issues, one of the biggest challenges for these companies will be to gain consumer acceptance (Post et al., 2020). Given that consumer acceptance is predicted by each of the three categories suggested (Siegrist, 2008), namely product-related, psychological and external factors, marketeers should address variables from each of the three categories and not just one.

Regarding product-related factors, to increase consumer acceptance, CM companies could make potential consumers more familiar with the new product (Bryant et al., 2019; Mancini & Antonioli, 2019). The importance of familiarity was demonstrated in a hamburger tasting study with purported CM which was in fact conventional meat. Next to the information provided and whether participants engaged in a tasting in the supposed CM burger, the best predictor of acceptance for the fake CM burger was prior awareness of CM (Rolland et al., 2020). Similar patterns regarding familiarity and acceptance were found for other novel foods such as insect-based meat alternatives (Piha et al., 2018). Awareness for and familiarity with CM could be achieved through for example a strong media presence and, once it is possible, by arranging tastings as was found to be effective to increase consumer acceptance of novel insect-based foods (Lensvelt & Steenbekkers, 2014).

Psychological factors should be addressed by considering the insights about neophobia and disgust evoked by CM. Neophobic participants displayed lower levels of acceptance. Familiarity through exposure to CM could reduce the negative effect of neophobia as previous research found interaction effects between neophobia and familiarity regarding consumer acceptance of novel foods (Raudenbush & Frank, 1999; Tuorila et al., 2001). Food neophobia was found to be strongly associated with negative reactions to novel foods, but not with reactions to familiar foods (Pliner & Salvy, 2006). Hence, again a

solution would be to make people more familiar with CM. Additionally, marketeers should be aware of the strongest predictor for CM acceptance: disgust evoked by CM. The awareness of this predictor may be exploited by marketers by presenting CM in a particularly appetizing way. This would be in line with previous research that showed that framing CM as a product similar to conventional meat or in terms of societal benefits elicits more acceptance than a description of CM as a high-tech food (Bryant & Dillard, 2019). Another study found similar results that tested different product descriptions. CM should be described non-technically focusing on the final product rather than on the production process. Such a non-technical description compared with a technical description did not directly influence the disgust evoked by CM, but via perceived naturalness and thereby increased acceptance (Siegrist, Sütterlin, & Hartmann, 2018). Overall, instead of highlighting the production process of CM, marketeers should highlight the similarities of CM and conventional meat, namely that both consist of muscles from an animal and that they smell and taste the same (Post, 2012).

To address external factors, marketeers should address people's subjective norm regarding CM and should be aware of the effect of the dynamics of trust in the food industry on CM acceptance. Consumers should perceive CM as the new normal through for example advertisement that presents CM as a product that is consumed by normal people. This would be in line with consumer research from the field of novel insect-based foods that emphasizes that an enhanced subjective norm could help to promote novel food products (Bae & Choi, 2021). Additionally, marketeers of CM should be aware of the role of people's trust in the food industry. Trust is a complex and cultural phenomenon. Depending on culture trust has different dynamics. While for example in Russia distrust in formal institutions is wide-spread and causes consumers to rely on informal networks to provide with food safety, Germans were found to trust in formal and trustworthy institutions to evaluate the information about novel foods (Dolgopolova et al., 2015). Hence, trust should be considered as a contextual driver of consumer acceptance of CM, which makes it hard to influence for CM companies themselves. Instead, formal and informal institutions that regulate the market entry of CM and thereby influence consumer trust play a central role in gaining consumer acceptance of CM and other novel foods.

To conclude, next to tackling technical and regulatory challenges, CM companies should take a holistic approach to promote CM acceptance by addressing multiple drivers of consumer acceptance from product-related, psychological and external categories.

References

Aldridge, V., Dovey, T. M., & Halford, J. C. G. (2009). The role of familiarity in dietary development. *Developmental Review*, *29*(1), 32–44.

Ammann, J., Hartmann, C., & Siegrist, M. (2018). Does food disgust sensitivity influence eating behaviour? Experimental validation of the food disgust scale. *Food Quality and Preference*, *68*, 411–414.

Bae, Y., & Choi, J. (2021). Consumer acceptance of edible insect foods: An application of the extended theory of planned behavior. *Nutrition Research and Practice*, *15*(1), 122–135.

Bellarby, J., Tirado, R., Leip, A., Weiss, F., Lesschen, J. P., & Smith, P. (2013). Livestock greenhouse gas emissions and mitigation potential in europe. *Global Change Biology*, *19*(1), 3–18.

Bhat, Z. F., Kumar, S., & Fayaz, H. (2015). In vitro meat production: Challenges and benefits over conventional meat production. *Journal of Integrative Agriculture*, *14*(2), 241–248.

Bryant, C., & Dillard, C. (2019). The impact of framing on acceptance of cultured meat. *Frontiers in Nutrition*, *6*, 103. https://doi.org/10.3389/fnut.2019.00103

Bryant, C., & Sanctorum, H. (2021). Alternative proteins, evolving attitudes: Comparing consumer attitudes to plant-based and cultured meat in Belgium in two consecutive years. *Appetite*, *161*, 105161.

Bryant, C., Szejda, K., Parekh, N., Deshpande, V., & Tse, B. (2019). A survey of consumer perceptions of plant-based and clean meat in the USA, india, and china. *Frontiers in Sustainable Food Systems*, *3*, 11.

Caro, D., Davis, S. J., Bastianoni, S., & Caldeira, K. (2014). Global and regional trends in greenhouse gas emissions from livestock. *Climatic Change*, *126*(1), 203–216.

The Guardian. (2020). *No-kill, lab-grown meat to go on sale for first time* [Press release].

Chriki, S., & Hocquette, J.-F [Jean-François] (2020). The myth of cultured meat: A review. *Frontiers in Nutrition*, *7*, 7. https://doi.org/10.3389/fnut.2020.00007

Cook, A. J., Kerr, G. N., & Moore, K. (2002). Attitudes and intentions towards purchasing gm food. *Journal of Economic Psychology*, *23*(5), 557–572.

Costa-Font, M., & Gil, J. M. (2009). Structural equation modelling of consumer acceptance of genetically modified (gm) food in the mediterranean europe: A cross country study. *Food Quality and Preference*, *20*(6), 399–409.

Dolgopolova, I., Teuber, R., & Bruschi, V. (2015). Consumers' perceptions of functional foods: Trust and food-neophobia in a cross-cultural context. *International Journal of Consumer Studies*, *39*(6), 708–715.

Dormann, C. F., Elith, J., Bacher, S., Buchmann, C., Carl, G., Carré, G., Marquéz, J. R. G., Gruber, B., Lafourcade, B., & Leitão, P. J. (2013). Collinearity: A review of methods to deal with it and a simulation study evaluating their performance. *Ecography*, *36*(1), 27–46.

Dunlap, R. E., van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New trends in measuring environmental attitudes: Measuring endorsement of the new ecological paradigm: A revised nep scale. *Journal of Social Issues*, *56*(3), 425–442.

Dupont, J., & Fiebelkorn, F. (2020). Attitudes and acceptance of young people toward the consumption of insects and cultured meat in Germany. *Food Quality and Preference*, *85*, 103983. https://doi.org/10.1016/j.foodqual.2020.103983

Egolf, A., Hartmann, C., & Siegrist, M. (2019). When evolution works against the future: Disgust's contributions to the acceptance of new food technologies. *Risk Analysis*, *39*(7), 1546–1559.

Egolf, A., Siegrist, M., & Hartmann, C. (2018). How people's food disgust sensitivity shapes their eating and food behaviour. *Appetite*, *127*, 28–36.

FAO. (2011). *World livestock 2011 - Livestock in food security*. Food and Agriculture Organization of the United Nations (FAO).

Ghosh, P. (2013). World's first lab-grown burger is eaten in London. *BBC News [ONLINE] Available at: Www. Bbc. Com/news/scienceenvironment-23576143 (Accessed 09 May 2016)*.

Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic decision making. *Annual Review of Psychology*, *62*, 451–482.

Grunert, K. G., Bredahl, L., & Scholderer, J. (2003). Four questions on European consumers' attitudes toward the use of genetic modification in food production. *Innovative Food Science & Emerging Technologies*, *4*(4), 435–445.

Hawcroft, L. J., & Milfont, T. L. (2010). The use (and abuse) of the new environmental paradigm scale over the last 30 years: A meta-analysis. *Journal of Environmental Psychology*, *30*(2), 143–158.

Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford publications.

Heath, C., Bell, C., & Sternberg, E. (2001). Emotional selection in memes: The case of urban legends. *Journal of Personality and Social Psychology*, *81*(6), 1028.

Herrero, M., Havlík, P., Valin, H., Notenbaert, A., Rufino, M. C., Thornton, P. K., Blümmel, M., Weiss, F., Grace, D., & Obersteiner, M. (2013). Biomass use, production, feed efficiencies, and greenhouse gas emissions from global livestock systems. *Proceedings of the National Academy of Sciences*, *110*(52), 20888–20893.

Hocquette, J.-F [Jean-François] (2016). Is in vitro meat the solution for the future? *Meat Science*, *120*, 167–176. https://doi.org/10.1016/j.meatsci.2016.04.036

Hwang, J., You, J., Moon, J., & Jeong, J. (2020a). Factors affecting consumers' alternative meats buying intentions: Plant-based meat alternative and cultured meat. *Sustainability*, *12*(14), 5662.

Hwang, J., You, J., Moon, J., & Jeong, J. (2020b). Factors affecting consumers' alternative meats buying intentions: Plant-based meat alternative and cultured meat. *Sustainability*, *12*(14), 5662.

Jensen, N. H., & Lieberoth, A. (2019). We will eat disgusting foods together–evidence of the normative basis of western entomophagy-disgust from an insect tasting. *Food Quality and Preference*, *72*, 109–115.

Kahneman, D., Slovic, S. P., Slovic, P., & Tversky, A. (1982). *Judgment under uncertainty: Heuristics and biases*. Cambridge university press.

Kim, Y. G., Jang, S. Y., & Kim, A. K. (2014). Application of the theory of planned behavior to genetically modified foods: Moderating effects of food technology neophobia. *Food Research International*, *62*, 947–954.

Kolkmann, A. M., Post, M. J [M. J.], Rutjens, M. A., van Essen, A. L., & Moutsatsou, P [P.] (2020). Serum-free media for the growth of primary bovine myoblasts. *Cytotechnology*, *72*(1), 111–120.

Koning, W. de, Dean, D., Vriesekoop, F., Aguiar, L. K., Anderson, M., Mongondry, P., Oppong-Gyamfi, M., Urbano, B., Luciano, C. A. G., & Jiang, B. (2020). Drivers and inhibitors in the acceptance of meat alternatives: The case of plant and insect-based proteins. *Foods (Basel, Switzerland)*, *9*(9), 1292.

Laestadius, L. I., & Caldwell, M. A. (2015). Is the future of meat palatable? Perceptions of in vitro meat as evidenced by online news comments. *Public Health Nutrition*, *18*(13), 2457–2467.

Lensvelt, E. J. S., & Steenbekkers, L. P. (2014). Exploring consumer acceptance of entomophagy: A survey and experiment in australia and the Netherlands. *Ecology of Food and Nutrition*, *53*(5), 543–561.

Macoubrie, J. (2004). Public perceptions about nanotechnology: Risks, benefits and trust. *Journal of Nanoparticle Research*, *6*(4), 395–405.

Mancini, M. C., & Antonioli, F. (2019). Exploring consumers' attitude towards cultured meat in Italy. *Meat Science*, *150*, 101–110. https://doi.org/10.1016/j.meatsci.2018.12.014

Marcu, A., Gaspar, R., Rutsaert, P., Seibt, B., Fletcher, D [David], Verbeke, W., & Barnett, J. (2015). Analogies, metaphors, and wondering about the future: Lay sense-making around synthetic meat. *Public Understanding of Science (Bristol, England)*, *24*(5), 547–562. https://doi.org/10.1177/0963662514521106

Michel, F., & Siegrist, M. (2019). How should importance of naturalness be measured? A comparison of different scales. *Appetite*, *140*, 298–304.

Olatunji, B. O., Williams, N. L., Tolin, D. F., Abramowitz, J. S., Sawchuk, C. N., Lohr, J. M., & Elwood, L. S. (2007). The disgust scale: Item analysis, factor structure, and suggestions for refinement. *Psychological Assessment*, *19*(3), 281.

Onwezen, M. C., Bouwman, E. P., Reinders, M. J., & Dagevos, H. (2020). A systematic review on consumer acceptance of alternative proteins: Pulses, algae, insects, plant-based meat alternatives, and cultured meat. *Appetite*, 105058.

Piha, S., Pohjanheimo, T., Lähteenmäki-Uutela, A., Křečková, Z., & Otterbring, T. (2018). The effects of consumer knowledge on the willingness to buy insect food: An exploratory cross-regional study in northern and central europe. *Food Quality and Preference*, *70*, 1–10.

Pliner, P., & Hobden, K. (1992). Development of a scale to measure the trait of food neophobia in humans. *Appetite*, *19*(2), 105–120.

Pliner, P., & Salvy, S. (2006). Food neophobia in humans. *Frontiers in Nutritional Science*, *3*, 75.

Post, M. J [Mark J.] (2012). Cultured meat from stem cells: Challenges and prospects. *Meat Science*, *92*(3), 297–301. https://doi.org/10.1016/j.meatsci.2012.04.008

Post, M. J [Mark J.], & Hocquette, J.-F [J-F]. (2017). New sources of animal proteins: Cultured meat. In *New aspects of meat quality* (pp. 425–441). Elsevier.

Post, M. J [Mark J.], Levenberg, S., Kaplan, D. L., Genovese, N., Fu, J., Bryant, C. J., Negowetti, N., Verzijden, K., & Moutsatsou, P [Panagiota] (2020). Scientific, sustainability and regulatory challenges of cultured meat. *Nature Food*, *1*(7), 403–415.

Prati, G., Pietrantoni, L., & Zani, B. (2012). The prediction of intention to consume genetically modified food: Test of an integrated psychosocial model. *Food Quality and Preference*, *25*(2), 163–170.

Raudenbush, B., & Frank, R. A. (1999). Assessing food neophobia: The role of stimulus familiarity. *Appetite*, *32*(2), 261–271.

Rivis, A., & Sheeran, P. (2003). Descriptive norms as an additional predictor in the theory of planned behaviour: A meta-analysis. *Current Psychology*, *22*(3), 218–233.

Rodríguez-Entrena, M., Salazar-Ordóñez, M., & Sayadi, S. (2013). Applying partial least squares to model genetically modified food purchase intentions in southern Spain consumers. *Food Policy*, *40*, 44–53.

Rohrer, J. M., Hünermund, P., Aslan, R. C., & Elson, M. (2021). That's a lot to process! Pitfalls of popular path models. https://doi.org/10.31234/osf.io/paeb7

Rolland, N. C. M., Markus, C. R., & Post, M. J [Mark J.] (2020). The effect of information content on acceptance of cultured meat in a tasting context. *PloS One*, *15*(4), e0231176.

Ronteltap, A., van Trijp, J. C., & Renes, R. J. (2008). Consumer acceptance of nutrigenomics-based personalised nutrition. *British Journal of Nutrition*, *101*(1), 132–144.

Ronteltap, A., van Trijp, J. C., Renes, R. J., & Frewer, L. J. (2007). Consumer acceptance of technology-based food innovations: Lessons for the future of nutrigenomics. *Appetite*, *49*(1), 1–17.

Rozin, P., & Vollmecke, T. A. (1986). Food likes and dislikes. *Annual Review of Nutrition*, *6*(1), 433–456.

Ruzgys, S., & Pickering, G. J. (2020). Perceptions of cultured meat among youth and messaging strategies. *Frontiers in Sustainable Food Systems*, *4*, 122.

Sakadevan, K., & Nguyen, M.-L. (2017). Livestock production and its impact on nutrient pollution and greenhouse gas emissions. *Advances in Agronomy*, *141*, 147–184.

Schaefer, G. O., & Savulescu, J. Journal of applied philosophyvolume 31, issue 2, article first published online: 27 feb 2014. *The Ethics of Producing in Vitro Meat*.

Schmidinger, K., Bogueva, D., & Marinova, D. (2021). New meat without livestock. In *Research anthology on food waste reduction and alternative diets for food and nutrition security* (pp. 1110–1127). IGI Global.

Shen, Y.-C., & Chen, H.-S. (2020). Exploring consumers' purchase intention of an innovation of the agri-food industry: A case of artificial meat. *Foods (Basel, Switzerland)*, *9*(6), 745.

Siegrist, M. (2008). Factors influencing public acceptance of innovative food technologies and products. *Trends in Food Science & Technology*, *19*(11), 603–608.

Siegrist, M., & Hartmann, C. (2020a). Consumer acceptance of novel food technologies. *Nature Food*, *1*(6), 343–350. https://doi.org/10.1038/s43016-020-0094-x

Siegrist, M., & Hartmann, C. (2020b). Perceived naturalness, disgust, trust and food neophobia as predictors of cultured meat acceptance in ten countries. *Appetite*, *155*, 104814. https://doi.org/10.1016/j.appet.2020.104814

Siegrist, M., Hübner, P., & Hartmann, C. (2018). Risk prioritization in the food domain using deliberative and survey methods: Differences between experts and laypeople. *Risk Analysis*, *38*(3), 504–524.

Siegrist, M., Sütterlin, B., & Hartmann, C. (2018). Perceived naturalness and evoked disgust influence acceptance of cultured meat. *Meat Science*, *139*, 213–219. https://doi.org/10.1016/j.meatsci.2018.02.007

Slade, P. (2018). If you build it, will they eat it? Consumer preferences for plant-based and cultured meat burgers. *Appetite*, *125*, 428–437.

Spence, A., & Townsend, E. (2006). Examining consumer behavior toward genetically modified (gm) food in britain. *Risk Analysis*, *26*(3), 657–670.

Szejda, K., Bryant, C. J., & Urbanovich, T. (2021). US and UK consumer adoption of cultivated meat: A segmentation study. *Foods (Basel, Switzerland)*, *10*(5), 1050.

Taber, K. S. (2018). The use of cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, *48*(6), 1273–1296.

Thoemmes, F. (2015). Reversing arrows in mediation models does not distinguish plausible models. *Basic and Applied Social Psychology*, *37*(4), 226–234.

Tuomisto, H., Ellis, M., & Haastrup, P. (2014). Environmental impacts of cultured meat: Alternative production scenario.

Tuomisto, H. L., & Teixeira de Mattos, M. Joost (2011). Environmental impacts of cultured meat production. *Environmental Science & Technology*, *45*(14), 6117–6123. https://doi.org/10.1021/es200130u

Tuorila, H., Lähteenmäki, L., Pohjalainen, L., & Lotti, L. (2001). Food neophobia among the finns and related responses to familiar and unfamiliar foods. *Food Quality and Preference*, *12*(1), 29–37.

van Griethuijsen, R. A., Kunst, E. M., van Woerkom, M., Wesselink, R., & Poell, R. F. (2020). Does implementation of competence-based education mediate the impact of team learning on student satisfaction? *Journal of Vocational Education & Training*, *72*(4), 516–535.

Verbeke, W., Marcu, A., Rutsaert, P., Gaspar, R., Seibt, B., Fletcher, D [Dave], & Barnett, J. (2015). 'would you eat cultured meat?': Consumers' reactions and attitude formation in Belgium, Portugal and the United Kingdom. *Meat Science*, *102*, 49–58. https://doi.org/10.1016/j.meatsci.2014.11.013

Verbeke, W., Sans, P., & van Loo, E. J. (2015). Challenges and prospects for consumer acceptance of cultured meat. *Journal of Integrative Agriculture*, *14*(2), 285–294.

Vidigal, M. C., Minim, V. P. R., Simiqueli, A. A., Souza, P. H. P., Balbino, D. F., & Minim, L. A. (2015). Food technology neophobia and consumer attitudes toward foods produced by new and conventional technologies: A case study in brazil. *LWT-Food Science and Technology*, *60*(2), 832–840.

Vlontzos, G., & Duquenne, M. N. (2016). To eat or not to eat? The case of genetically modified (gm) food. *Nutrition & Food Science*.

Weinrich, R., Strack, M., & Neugebauer, F. (2020). Consumer acceptance of cultured meat in Germany. *Meat Science*, *162*, 107924.

Westhoek, H., Lesschen, J. P., Rood, T., Wagner, S., Marco, A. de, Murphy-Bokern, D., Leip, A., van Grinsven, H., Sutton, M. A., & Oenema, O. (2014). Food choices, health and environment: Effects of cutting europe's meat and dairy intake. *Global Environmental Change*, *26*, 196–205.

Wilks, M., & Phillips, C. J. C. (2017). Attitudes to in vitro meat: A survey of potential consumers in the united states. *PloS One*, *12*(2), e0171904.

Wilks, M., Phillips, C. J. C., Fielding, K., & Hornsey, M. J. (2019). Testing potential psychological predictors of attitudes towards cultured meat. *Appetite*, *136*, 137–145. https://doi.org/10.1016/j.appet.2019.01.027

Zhang, M., Li, L., & Bai, J. (2020). Consumer acceptance of cultured meat in urban areas of three cities in china. *Food Control*, *118*, 107390.

APPENDIX

Table 5 – *Details about the scales*

Construct	Source	Items	Scale Endpoints
Attitude towards the environment	Dunlap et al. (2000)	We are approaching the limit of the number of people the earth can support. Humans have the right to modify the natural environment to suit their needs. [R] When humans interfere with nature it often produces disastrous consequences. Human ingenuity will insure that we do NOT make the earth unliveable. [R] Humans are severely abusing the environment. The earth has plenty of natural resources if we just learn how to develop them. [R] Plants and animals have as much right as humans to exist. The balance of nature is strong enough to cope with the impacts of modern industrial nations. [R] Despite our special abilities humans are still subject to the laws of nature. The so–called ‘‘ecological crisis’’ facing humankind has been greatly exaggerated. [R] The earth is like a spaceship with very limited room and resources. Humans were meant to rule over the rest of nature. [R] The balance of nature is very delicate and easily upset. Humans will eventually learn enough about how nature works to be able to control it. [R] If things continue on their present course, we will soon experience a major ecological catastrophe.	1 – 5
Trust	Siegrist & Hartmann (2020b)	I trust the food industry. You can rely on governmental controls in the food sector. I trust food retailers. I trust food scientists.	1 – 6

Food neophobia	Pliner & Hobden (1992)	I am constantly sampling new and different foods. [R]	1 – 5
		I do not trust new foods.	
		I like foods from different countries. [R]	
		If I do not know what is in a food, I will not eat it.	
		At dinner parties, I will try a new food. [R]	
		Some foods look too weird to eat.	
		I am afraid to eat things I have never had before.	
		I am very particular about the foods I eat.	
		I will eat almost anything. [R]	
		I like to try new foods from all over the world. [R]	
Food disgust sensitivity	Hartman & Siegrist (2018)	To put animal cartilage into my mouth	1 – 6
		To eat with dirty silverware in a restaurant	
		Food donated from a neighbour whom I barely know	
		To eat hard cheese from which mould was cut off	
		To eat apple slices that turned brown when exposed to air	
		The texture of some kinds of fish in the mouth	
		To eat brown-coloured avocado pulp	
		There is a little snail in the salad that I wanted to eat	
Familiarity	Bryant et al. (2019)	Prior to reading the description, how familiar were you with this new way of producing meat, called "clean meat"?	1 – 5
Intention to consume CM	Rolland et al. (2020)	Do you like to try cultured meat?	1 – 5
		Will you buy cultured meat when it becomes available in the supermarkets?	1 – 5
		Are you willing to replace your meat current meat consumption by consumption of cultured meat?	1 – 5
Perceived risks and benefits	Wilks et al. (2019)	How healthy do you think cultured meat is compared to farmed meat?	1 – 5
		How environmentally friendly do you think cultured meat is compared to farmed meat?	

		How ethical do you think cultured meat is compared to farmed meat? How tasty do you think cultured meat would be compared to farmed meat?	
Perceived naturalness	Siegrist & Hartmann (2020b)	"How artificial/natural do you assess cultured meat to be?" by moving a slider with possible responses ranging from "artificial" to "natural".	
Disgust evoked by CM	Siegrist & Hartmann (2020b)	"Do you perceive cultured meat as disgusting?" by moving a slider with possible responses ranging from "not disgusting at all" to "extremely disgusting".	
SN	Spencer & Townsend (2006)	"The people in my life whose opinions I value would not mind if the meat they eat was cultured meat." "Most people who are important to me consider cultured meat to be:" "The people in my life who are important to me would not mind if I ate cultured meat."	1 – 7
Meat eating habits		On average, for how many meals per week do you consume meat (including seafood)? On average, for how many meals per week do you consume meat substitutes?	1 – 7
Gender		What is your gender?	Male/female/diverse
Age		How old are you?	
Gender		Are you…?	Female, male, diverse
Nationality		What is your nationality?	
Education		What is your highest level of education?	No education/ primary school/ some high school/ technical qualification or trade certificate/ college or undergraduate degree/ postgraduate degree
Income		What is you net household income?	Less than 1.000€/ 1.000-2.500€/ 2.500 – 4.000€/ more than 4.000€

Meat industry relations	Do you work in the meat industry (farm, slaughterhouse, meatpacker, butcher, BBQ restaurant or the like)? Do you have family or close friends working in the meat industry?	Yes/no

Table 6 – *Original model with interactions*

Step and Predictor Variable	*B*	*SE B*	*β*	R^2 *Adj*	*Tolerance*	*VIF*
				.492***		
Trust	.100	.108	.084		.235	4.255
Neophobia	-.213	.117	-.126		.417	2.401
Disgust sensitivity	.059	.088	.046		.408	2.452
Naturalness	3.724E-5	.007	.001		.078	12847
Disgust evoked by CM	-.020	.009	-.564*		.030	33.870
Interaction: Trust and naturalness	.002	.002	.142		.067	14.958
Interaction: Trust and disgust evoked by CM	.001	.002	.098		.088	11.310
Interaction: Neophobia and disgust evoked by CM	-.004	.003	-.293		.041	24.669
Interaction: Disgust sensitivity and disgust evoked by CM	.002	.002	.175		.039	25.490

*p<.05, **p<.01, ***p<.001

Table 7 – *Original model without interactions*

Step and Predictor Variable	*B*	*SE B*	*β*	R^2 *Adj*	*Tolerance*	*VIF*
				.495***		
Trust	.178	.053	.151**		.964	1.037

Neophobia	-.316	.085	-.186***	.782	1.279
Disgust sensitivity	.103	.064	.081	.772	1.295
Naturalness	.006	.002	.128**	.932	1.073
Disgust evoked by CM	-.021	.002	-.579***	.815	1.227

*p<.05, **p<.01, ***p<.001

Table 8 – *Extended model with interactions*

Step and Predictor Variable	*B*	*SE B*	*β*	R^2 *Adj*	ΔR^2	*Tolerance*	*VIF*
Step 1				.495***	.505***		
Trust	.178	.053	.151**			.964	1.037
Neophobia	.006	.002	.128**			.932	1.073
Disgust sensitivity	-.316	.085	-.186***			.782	1.279
Naturalness	-.021	.002	-.579***			.815	1.227
Disgust evoked by CM	.103	.064	.081			.772	1.295
Step 2				.544***	.058***		
Trust	.420	.213	.354*			.054	18.360
Naturalness	.003	.002	.078			.842	1.187
Neophobia	-.588	.171	-.346*			.173	5.780
Disgust evoked by CM	-.015	.002	-.420			.535	1.867
Disgust sensitivity	.092	.062	.072			.754	1.326
Perceived benefits	.308	.218	.202			.086	11.652
Familiarity	-.174	.142	-.193			.071	13.992
Attitude towards the environment	.143	.095	.066			.919	1.088
Subjective norm	.146	.049	.157**			.637	1.570
Interaction: Neophobia	.114	.056	.326*			.068	14.692

and familiarity							
Interaction: Trust and perceived benefits	-.061	.065	-.220			.032	31.081

*p<.05, **p<.01, ***p<.001

Table 9 – *Extended model without interactions*

Step and Predictor Variable	*B*	*SE B*	*β*	R^2 *Adj*	ΔR^2	*Tolerance*	*VIF*
Step 1				.495***	.505***		
Trust	.178	.053	.151**			.964	1.037
Neophobia	-.316	.085	-.186***			.782	1.279
Disgust sensitivity	.103	.064	.081			.772	1.295
Naturalness	.006	.002	.128**			.932	1.073
Disgust evoked by CM	-.021	.002	-.579***			.815	1.227
Step 2				.538***	.049***		
Trust	.207	.052	.175***			.933	1.072
Neophobia	-.273	.082	-.161**			.760	1.316
Disgust sensitivity	.091	.062	.072			.756	1.322
Naturalness	.004	.002	.081			.846	1.182
Disgust evoked by CM	-.015	.002	-.418***			.537	1.862
Perceived benefits	.118	.092	.078			.488	2.051
Familiarity	.100	.043	.110*			.785	1.274
Attitude towards the environment	.146	.095	.068			.922	1.085
Subjective norm	.150	.049	.161**			.641	1.560

*p<.05, **p<.01, ***p<.001