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Extension of the Theory of Planned Behavior to predict the intention to consume insect-based products – The moderating effect of food neophobia

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Barcelona, 19 de Junio de 2017

TABLE OF CONTENTS

	Abstract	01
1.	Introduction	06
2.	Literature Review	07
3.	Methodology	14
4.	Provisional Results	18
5.	Conclusions	20
	Acknowledgements	21
	Reference List	21
	Appendix 1: Questionnaire development	24
	Appendix 2: Questionnaire responses (n = 5)	26
	Appendix 3: Forecast for the completion of the study	28
	Table 01: Comparison of protein content among different insects and cattle	09
	Table 02: Demographic variables and their breakdown among the respondents	12
	Table 03: Sample size from meta-analysis study (Scalco et al., 2017)	15
	Table 04: Sample size determination with Power analysis	15
	Table 05: Sample socio-demographic characteristics (n = 5)	16
	Table 06: Internal consistency and convergent validity	19
	Table 07: Assessment of discriminant validity	19
	Table 08: Collinearity assessment	20
	Table 09: Questionnaire (Demographics Section)	25
	Table 10: Questionnaire (Theory of Planned Behavior Section)	25
	Table 11: Questionnaire (Food Neophobia Section)	26
	Table 12: Questionnaire responses (n = 5)	27
	Table 13: Forecast for the completion of the study	28

Figure 01: Example of an approved novel food in the European Union	08
Figure 02: Efficiencies of production of conventional meat and crickets	10
Figure 03: Illustration of the Hypotheses	14

Abstract

Purpose

The purpose of this paper is to investigate the determinants of the adoption of insect-based products in the province of Barcelona. The aim is to explain the effect of attitude, subjective norm and perceived behavioral control on consumption intention towards insect-based products. Since insect-based products are a novel food, and thus it is unfamiliar, relatively as compared to conventional food, food neophobia will be incorporated into the model to assess its moderation effect.

Methodology

A quantitative approach via paper-based questionnaire will be adopted. The sample will consist of 300 observations. Structural equation modelling using partial least squares approach will be utilized to assess the relationships of variables under investigation and the moderation effect of food neophobia.

Findings

The findings are expected to show that attitude, subjective norm and perceived behavioral control all have a positive effect on consumption intention of insect-based products. However, food neophobia is expected to have just a moderation effect on the relationship between subjective norm and consumption intention.

Research limitations

The sample will largely consist of people living in the metropolitan area of Barcelona, who might be more daring to try new things, including novel food and, thereby insect-based products, as compared with people living in less cosmopolitan areas.

Research implications

Knowing consumers' specific beliefs about adopting novel foods, and specifically adopting insect-based products, would provide a more detailed and comprehensive understanding of consumption intention and the moderating effect of food neophobia as antecedents in the theory of planned behavior.

Practical implications

The understanding of how people adopt novel foods, specifically insect-based products, using the extended theory of planned behavior, would contribute to the knowledge, not only of consumer behavior, but also to the legislation of the distribution of insect-based products within the European Union, to the food and service industry and to the farming industry, which would be able to adapt faster to the changing environmental and customer needs and, consequently, would be able to offer an array of products better suited to meet those changing needs.

Keywords: Theory of planned behavior, Entomophagy, Food neophobia

JEL classification: M30, L66, I12

Paper type: Research paper

Abstract in Spanish

Objetivo

El objetivo de este artículo es investigar los determinantes de la adopción de productos basados en insectos en la provincia de Barcelona. El objetivo es explicar el efecto de la actitud, la norma subjetiva y el control percibido del comportamiento sobre la intención de consumo hacia los productos basados en insectos. Dado que los productos basados en insectos son un alimento novedoso y, por tanto, bastante desconocido, la neofobia alimentaria se incorporará al modelo para evaluar su efecto moderador.

Metodología

Se adoptará un enfoque cuantitativo a través de un cuestionario en papel. La muestra consistirá en 300 observaciones. Se utilizará el modelo de ecuaciones estructurales, con el método de los mínimos cuadrados parciales, para evaluar las relaciones entre las variables investigadas y el efecto moderador de la neofobia alimentaria.

Hallazgos

Se espera que la actitud, la norma subjetiva y el control percibido del comportamiento tengan un efecto positivo en la intención de consumir productos basados en insectos. Sin embargo, se espera que la neofobia alimentaria tenga sólo un efecto de moderación en la relación entre la norma subjetiva y la intención de consumo.

Limitaciones de la Investigación

La muestra se compondrá principalmente de personas que viven en el área metropolitana de Barcelona, que podrían ser más predispuestas a probar cosas nuevas, incluyendo alimentos nuevos y, por tanto, productos basados en insectos, en comparación con personas que viven en áreas menos cosmopolitas.

Implicaciones de la Investigación

Conocer las aptitudes de los consumidores ante la adopción de nuevos alimentos, específicamente sobre los productos basados en insectos, proporcionaría una comprensión más detallada de la intención de consumo y del efecto moderador de la neofobia alimentaria como antecedentes en la teoría del comportamiento planificado.

Implicaciones Prácticas

La comprensión de cómo las personas adoptan nuevos alimentos, específicamente productos basados en insectos, utilizando la extensión de la teoría del comportamiento planificado, contribuiría no sólo al estudio del comportamiento de los consumidores, sino también al desarrollo de la legislación de la distribución de productos basados en insectos en la Unión Europea, a la industria alimentaria y a la industria agropecuaria, que podrían adaptarse más rápidamente a los cambios en las necesidades de los clientes y, por consiguiente, podrían ofrecer una gama de productos mejor adaptada a esas necesidades cambiantes.

Palabras clave: Theory of planned behavior, Entomophagy, Food neophobia

Clasificación JEL: M30, L66, I12

Tipo de artículo: Trabajo de Investigación

Abstract in German

Zweck

Der Zweck dieser Arbeit ist es, die Einführung von insektenbasierten Produkten in der Provinz Barcelona zu untersuchen. Ziel ist es die Haltung und die wahrgenommenen Verhaltenskontrollen auf die Konsumabsicht gegenüber insektenbasierten Produkten zu erklären. Da insektenbasierte Produkte, verglichen mit konventionellen Speisen, neuartig und viele Menschen daher nicht vertraut damit sind, wird Lebensmittel-Neophobie in das Modell integriert, um den Mäßigungseffekt zu beurteilen.

Methodik

Es wird eine Umfrage mit papierbasierten Fragebogen geben. Es werden 300 Personen befragt. Eine strukturelle Gleichungsmodellierung unter Verwendung von partiellen kleinsten Quadratenansätzen wird verwendet, um die Beziehungen der untersuchten Variablen und den Mäßigungseffekt von Nahrungsneophobie zu bewerten.

Ergebnisse

Die Ergebnisse sollen zeigen, dass Haltung, subjektive Norm und wahrgenommene Verhaltenskontrolle alle einen positiven Effekt auf die Konsumabsicht von insektenbasierten Produkten haben. Allerdings ist zu erwarten, dass Lebensmittelneophobie nur eine mäßigende Wirkung auf die Beziehung zwischen subjektiver Norm und Konsumabsicht haben.

Forschungsbeschränkungen

Die Stichprobe besteht weitgehend aus Menschen, die in der Metropolregion von Barcelona leben, die vielleicht mehr kühn sind, neue Dinge auszuprobieren, einschließlich neuartiges Essen und damit Insekten basierte Produkte im Vergleich zu Menschen, die in weniger kosmopolitischen Gebieten leben.

Forschungsauswirkungen

Die Kenntnis der Überzeugungen der Konsumenten und die konkrete Meinung über Produkte auf Insektenbasis würde ein detaillierteres und umfassenderes Verständnis der Konsumabsicht und der moderaten Wirkung von Nahrungsneophobie als Vorläufer in der Theorie des geplanten Verhaltens liefern.

Praktische Auswirkungen

Das Verständnis davon, wie Menschen auf neuartige Lebensmittel reagieren, könnte zum Wissen über das Konsumverhalten beitragen und auch zur Gesetzgebung der Verteilung von Insektenbasierten Produkten innerhalb der Europäischen Union, der Lebensmittel und Dienstleistungsbranche und der Landwirtschaft, die sich an die sich wandelnden Umwelt und Kundenbedürfnisse schneller anpassen und damit eine Reihe von Produkten anbieten könnten, die besser geeignet sind, diesen sich ändernden Bedürfnissen gerecht zu werden.

Schlüsselwörter: Theory of planned behavior, Entomophagy, Food neophobia

JEL Einstufung: M30, L66, I12

Papiertyp: Forschungsarbeit

Abstract in French

Objectif

Le but de cet article est d'étudier les déterminants de l'adoption de produits à base d'insectes dans la province de Barcelone. L'objectif est d'expliquer l'effet de l'attitude, la norme subjective et le contrôle comportemental perçu sur l'intention de la consommation envers les produits à base d'insectes. Étant donné que les produits à base d'insectes sont un aliment nouveau et, par conséquent, ils ne sont pas familiers, la néophobie alimentaire sera incorporée dans le modèle pour évaluer son effet de modération.

Méthodologie

Une approche quantitative par questionnaire papier sera adoptée. L'échantillon sera composé de 300 observations. La modélisation des équations structurelles, utilisant une approche partielle des moindres carrés, sera utilisée pour évaluer les relations entre les variables étudiées et l'effet de modération de la néophobie alimentaire.

Résultats

Les résultats devraient montrer que l'attitude, la norme subjective et le contrôle comportemental perçu ont tous un effet positif sur l'intention de consommation des produits à base d'insectes. La néophobie alimentaire devrait avoir juste un effet de modération sur la relation entre la norme subjective et l'intention de consommation.

Les limites de la recherche

L'échantillon sera composé de personnes vivant dans la région métropolitaine de Barcelone, qui pourraient être plus audacieux à essayer de nouvelles choses, y compris de nouveaux aliments et des produits à base d'insectes, par rapport aux personnes vivant dans des régions moins cosmopolites.

Les implications de la recherche

Connaître les croyances des consommateurs concernant l'adoption de nouveaux aliments et, en particulier, l'adoption de produits à base d'insectes, fournirait une compréhension plus détaillée de l'intention de consommation et de l'effet modérateur de la néophobie alimentaire comme antécédents dans la théorie du comportement planifié.

Les implications pratiques

La compréhension de la façon dont les gens adoptent de nouveaux aliments, en particulier les produits à base d'insectes, en utilisant la théorie du comportement planifié, contribuerait à la connaissance non seulement du comportement des consommateurs, mais aussi à l'industrie de l'alimentation et l'industrie agricole, qui pourrait s'adapter plus rapidement aux besoins changeants des clients et, par conséquent, pourrait offrir une gamme de produits mieux adaptés à ces besoins changeants.

Mots-clés: Theory of planned behavior, Entomophagy, Food neophobia

Classification JEL: M30, L66, I12

Type d'article: Article de recherche

Abstract in Chinese

目的

本文的目的是调查在巴塞罗那采用昆虫产品的决定因素。目的是解释态度、主观规范和感知行为控制对昆虫产品消费意图的影响。由于昆虫类产品是一种新型食品，因此与常规食品相比是不熟悉的，因此食品恐惧症将纳入该模型以评估其适度效果。

目的

将采用以纸为基础的问卷调查的量化方法。样本将包含300个观察结果。利用偏最小二乘法构造方程模型，用于评估调查变量与食物恐惧症的适度作用关系。

发现

预计调查结果表明，态度、主观规范和感知行为控制均对昆虫产品的消费意图产生积极影响。然而，食品恐慌预计对主观规范与消费意图之间的关系起到缓和的作用。

研究局限性

样本主要由生活在巴塞罗那市区的人们组成，他们可能比不在市区的人们更有胆量尝试新事物，包括新鲜食物，以及昆虫产品。

研究内容

了解消费者对采用新型食品的具体信念，特别采用昆虫产品，将对计划行为理论中食品恐惧症作为前提的消费意图和调节作用提供更为详尽和全面的认识。

实际影响

了解人们如何采用新型食品，特别是基于昆虫的产品，使用扩展的计划行为理论，不仅有助于了解消费者行为的知识，而且还有助于知识分子的昆虫产品在欧盟、食品和服务业以及农业行业，这将能够更快地适应不断变化的环境和客户需求，从而能够提供一系列更适合满足不断变化的需求的产品。

关键词: Theory of planned behavior, Entomophagy, Food neophobia

JEL分类: M30, L66, I12

论文类型: 研究论文

1. Introduction

Food consumption behavior has been known to be complex since there are multiple factors that could affect the decision-making process (Yazdanpanah and Forouzani, 2015).

Relatively little is known about how and why people choose the foods that constitute their diets or about how their choices can be influenced in an effective way. The choice of foods is an area of concern for many people involved in the production and distribution of foods, and for those concerned with nutrition and health education (Al-Swidi et al., 2014).

The factors influencing food choices are categorized as those related to the food, to the person making the choice and to the external economic and social environment within which the choice is made (Mcdermott et al., 2015). Marketing and economic variables, as well as social, cultural, religious or demographic factors are also likely to be very important (Liobikienė et al., 2016).

The theory of planned behavior offers a means for trying to understand the roles of some of these factors (Arvola et al., 2008).

Even though most consumers are comfortable with their customary food choices, nowadays they are willing to explore different flavored and culturally diverse food to satisfy their changing preferences. Thus, novel food is found to be an evolving trend nowadays. It has also become part of everyday diet and its demand is expected to increase substantially in the coming years (Mullan et al., 2013).

The availability of new foods is growing very rapidly and has stimulated interest in the response of consumers to novel foods. There is a current trend towards cultural diversity and globalization with an increased demand for different kinds of food products with respect to what has traditionally been available. In the past it was assumed that consumers would accept new foods only if there was a specific and tangible benefit associated with their consumption, but many studies have disproved this belief (Frewer et al., 2003).

The raise on the consumption of novel food has been linked to the concept of food neophobia which is regarded as an influential factor affecting consumers' food choice. It is defined as one's reluctance towards trying novel foods (Pliner and Hobden, 1992).

Insects are an unusual novel food which has spurred several initiatives by a variety of organizations such as the FAO (Food and Agriculture Organization of the United Nations) and the EFSA (European Food Safety Authority) in promoting scientific facts about the utilization of insects as food.

Unclear regulation and legislation toward farming and selling insects for human consumption are obstacles that still need to be overcome. Thus, with the increasing scientific encouragement that insects receive as a promising aid to achieve sustainable levels of nutrition, the regulatory institutions of many countries are in the process of framing legislative structures related to the use of insects for human consumption (Halloran, 2014).

Food neophobia will be introduced in this study to the theory of planned behavior, expecting to provide a more detailed and comprehensive understanding of consumption intention as a moderating effect.

2. Literature Review

Food consumption intention

Food choice is a complex phenomenon considering the number of factors every person has to go through to decide what to eat on a regular basis (Visintin et al., 2012).

Food choice is not always taken in accordance to the needs of the human body. There is no conclusive evidence on why a person decides to consume new food over conventional food, or the other way around (Visintin et al., 2012).

There is an urge to deepen the understanding of a person's consumption attitude (Shin et al., 2016).

There is evidence that a positive attitude for organic products will make the consumer willing to spend more for those products. Attitude has also a significant effect on the intention to consume organic food (Shin et al., 2016).

Social influences are thought to impact food consumption behavior. For example, people tend to have a high degree of conformity when eating in group (Mcdermott et al., 2015).

Family and peer pressure provide a source of reference for consumption intention of certain foods (Teng and Wang, 2015).

On the other hand, teenagers and young adults are thought to have a higher tendency to experience new things (Arvola et al., 2008).

Novel food

Unfamiliar food items are those from countries other than the home country, therefore underlining a different food culture from the familiar cuisines of the home country (Visintin et al., 2012).

The acceptance or rejection to eat unfamiliar food has always been influenced by many factors, including sensory properties, cultural and societal environment, personal traits and individual beliefs, health concerns and availability on the market (Gmuer et al., 2016).

Although there has been recently a surge in the literature about the intention towards consuming organic and environment-friendly foods, there is still a lack of literature and empirical evidence to elucidate the intention of local consumers towards novel food (Maloney et al., 2014).

There are several national and international governmental bodies that define, classify and approve the use of novel foods in their territories. In the European Union, the European Food Safety Authority, under the Novel Foods Regulation (Regulation No 258/97), defines a novel food as a food that does not have a significant history of consumption by humans within the European Union. Such foods are subject to a pre-market safety assessment before a decision is made on EU-wide distribution authorization.

An example will be provided of a novel food that has been approved to be marketed within the European Union called *Salvia Hispanica* (commonly known as chia seeds).

The Commission Decision 2009/827/EC authorized the placing on the market of Chia (Salvia hispanica) seeds as a novel food ingredient, to be used in bread products with a maximum content of 5 % Chia (Salvia hispanica) seeds.

The Commission Implementing Decision 2013/50/EU has authorized an extension of the use of Chia seed -no more than 10% -in baked products, breakfast cereals, fruit nut and seed mixes, and the marketing of pre-packed chia seeds.

Additional labelling of pre-packaged Chia seeds is required to inform the consumer that the daily intake is no more than 15 g/day. Chia seed as such may be sold to the final consumer in a pre-packaged form only.

*Figure 1: Example of an approved novel food in the European Union
Source: Novel food - European Commission https://ec.europa.eu/food/safety/novel_food_en*

This research will follow the European Union definition and classification of novel foods.

Entomophagy

In the world, there are, at least, 1900 edible insect species (Martins and Pliner, 2006).

Although insects are considered an extravagant and unappealing food source for a large part of the population in developed countries, the FAO (Food and Agriculture Organization of the United Nations) claims that insects could mitigate the lack of nutritive resources (van Huis et al., 2013).

Edible insects are a food source that generally holds little sensory appeal (Tan et al., 2015), where the prospect of consumption often evoke feelings of disgust and distaste amongst those who are not accustomed to them as food (Martins and Pliner, 2006).

Previous research has found three main obstacles currently avoiding insects to become a mainstream food source: consumer acceptance, technology and regulation (Rumpold & Schlüter, 2013).

However, farming and eating insects have many benefits associated with it. These benefits can be classified into 3 main categories (health benefits, environmental benefits, and economic benefits).

Health benefits

With a growing world population, the production of sufficient protein from livestock, poultry, and fish represents a serious challenge for the future. According to a 2013 United Nations FAO report, approximately 805 million people were chronically undernourished worldwide in the year 2012. Insect-based products could help improve the diets of chronically undernourished people by providing an alternative way to get the necessary nutrients for survival (van Huis, 2013).

The FAO report stated that most edible insect species have comparable levels of protein to that of raw beef. Table 1 shows the protein content of different raw edible insects and raw beef (protein content when cooked may vary depending on the cooking method used).

Animal group	Species and common name	Edible product	Protein content (g/100 g fresh weight)
Insects (raw)	Locusts and grasshoppers: <i>Locusta migratoria</i> , <i>Acridium melanorhodon</i> , <i>Ruspolia differens</i>	larva	14–18
	Locusts and grasshoppers: <i>Locusta migratoria</i> , <i>Acridium melanorhodon</i> , <i>Ruspolia differens</i>	Adult	13–28
	<i>Sphenarium purpurascens</i> (chapulines – Mexico)	Adult	35–48
	Silkworm (<i>Bombyx mori</i>)	Caterpillar	10–17
	Palmworm beetles: <i>Rhynchophorus palmarum</i> , <i>R. phoenicis</i> , <i>Callipogon barbatus</i>	Larva	7–36
	Yellow mealworm (<i>Tenebrio molitor</i>)	Larva	14–25
	Crickets	Adult	8–25
	Termites	Adult	13–28
Cattle		Beef (raw)	19–26

Table 1: Comparison of protein content among different insects and cattle
Source: FAO, 2013 <http://www.fao.org/docrep/018/i3253e/i3253e00.htm>

On the other hand, as opposed to poultry or livestock, which can develop diseases that are contagious to humans, farming insects, because of their lack of similarity to humans, entail a lower risk of producing pathogens that are threatening to human health (Raubenheimer and Rothman, 2012).

Environmental benefits

The likelihood of accepting insects as food seems to increase with consumer awareness of the environmental impact of food production (Cicatiello et al., 2016).

Compared to conventional livestock, insects require less water and soil, emit lower levels of greenhouse gases and ammonia emissions, and produce a higher percentage of edible mass compared to most domestic breeding animal species (Raubenheimer and Rothman, 2012).

Economic benefits

Insects have higher reproduction rates and food conversion efficiencies than poultry, livestock or fish (Raubenheimer and Rothman, 2012). This fact can make insect farms economically viable by yielding lower costs per calorie produced.

Figure 2 shows the efficiencies of production of crickets compared to 3 conventional livestock (poultry, pork and beef). As much as 80% of the cricket mass can be used as food, producing only a 20% waste. Comparatively only 55% of poultry and pork mass and 40% of beef mass can be consumed.

Figure 2 also shows the ratio of kilograms feed to the livestock against kilograms of edible food produced. Crickets have a more efficient kilograms feed against kilograms produced ratio, compared to the more conventional livestock.

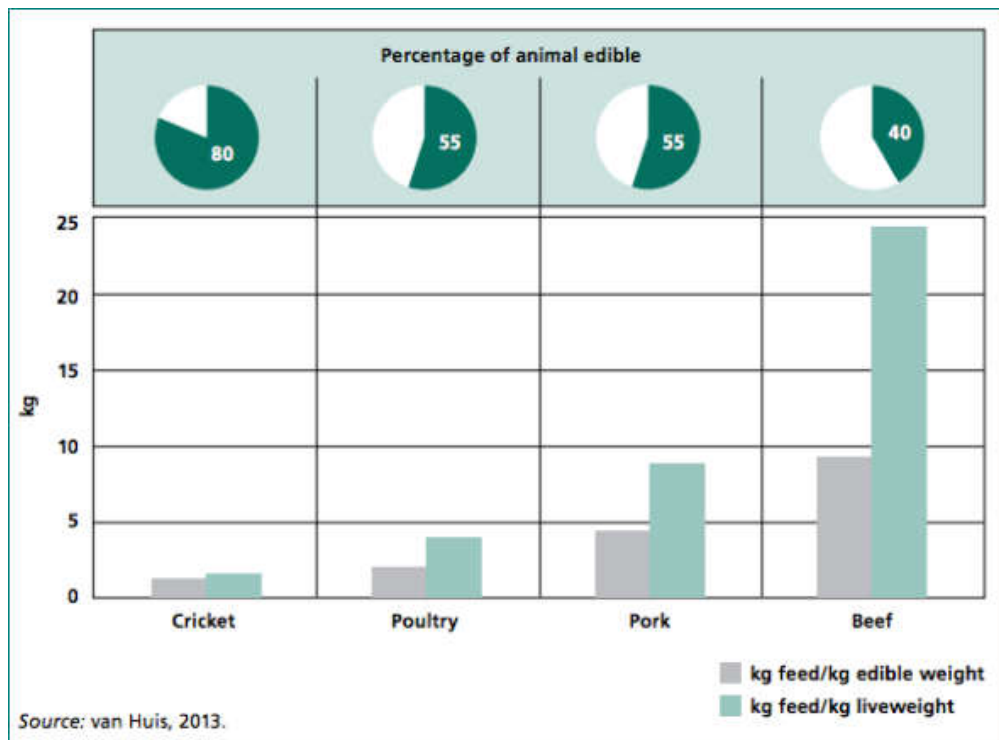


Figure 2: Efficiencies of production of conventional meat and crickets
Source: van Huis, 2013

Insect-based products are not yet approved as a novel food by the European Union. However, in 2015 the European Commission issued a request for reports (Regulation No 2015/2283, which will apply from 1st January 2018 onward) on the use of insects as food investing in the research of entomophagy as a human protein source. All this seems to indicate that insect-based products could enter the approved list of novel foods in the European Union within the next years.

There is not much published literature about the human consumption of insect-based products in Spain.

Theory of Planned Behavior

The Theory of Planned Behavior is one of the most commonly applied theoretical frameworks for predicting and understanding human behavior. It evolved from the earlier theory of reasoned action (Fishbein et al., 2001).

The Theory of Planned Behavior argues that human action is guided by three kinds of beliefs: behavioral beliefs, normative beliefs, and control beliefs. A behavioral belief, an individual's belief about the results of a behavior, creates the individual's attitude toward the behavior. Normative belief, which refers to an individual's perception of how a behavior will be judged by significant others, produces a subjective norm. Control belief refers to an individual's perceptions of the control he or she has over the behavior, which is connected to perceived behavioral control (Ajzen, 1991).

This perception of control is related to factors that may facilitate or impede performance of the behavior and whether the individual perceives the behavior as easy or difficult to perform (Ajzen, 1991).

The Theory of Planned Behavior shows that behavioral intention, which predicts whether an individual will perform a behavior, can be predicted by attitudes, the subjective norm, and perceived behavioral control. In brief, the more favorable a person's attitude and perceived behavioral control about a behavior and the more favorable the subjective norm, the stronger the person's intention will be to perform the behavior; the stronger the person's intention, the more likely he or she will be to perform the behavior (Ajzen, 1991).

Since it is relatively simple and predicts consumer intention and behavior well, the Theory of Planned Behavior has received considerable attention and has been widely and successfully applied in consumer research. One of those fields has been food consumption intentions (Mcdermott et al., 2015).

Introducing food neophobia as an extension of the Theory of Planned Behavior

Nowadays, in the developed countries, consumers perceive food to be generally safe. Nevertheless, some consumers may feel doubtful with unknown or unfamiliar foods (Maloney et al., 2014).

Food neophobia has been considered as a moderator to assess its effect on different behavioral outcomes (Chen, 2007).

Food neophobia can be defined as the fear to try new foods (Pliner and Salvy, 2006) and as a safety mechanism making people less likely to eat other products except from foods of known safety (Frewer et al., 2013).

There are three contributing factors to food neophobia: sensory quality of the food, information about the food product and consumers' personality trait. Sensory evaluation analyses human responses to the composition of food, such as appearance, touch, odor, texture, temperature and taste. Information about the food product increases the consumer familiarity with that food and, therefore, decreases their aversion towards consuming it. Consumers' personality trait is the propensity that each person has towards trying new foods (Kim et al., 2014).

Since food neophobia limits individuals' readiness to try new foods, it can restrict the marketability of new food flavors, styles and ingredients (Tuorila et al., 2001).

Neophobia is a relatively stable trait, which seems to vary with demographic differences. For instance, men have been reported as less choosy about foods than women (Frewer et al., 2013).

The elderly (defined as people who are over 65 years of age) are significantly more neophobic than younger age groups (Tuorila et al. 2001).

Individuals from rural areas are more neophobic than their urban counterparts (Tuorila et al., 2001).

The effect of food neophobia is reported to be different across countries (Frewer et al., 2013). Cultural difference is regarded as the driving reason. For example, Swedish subjects have been found to be more inclined to try new foods than those from the USA (Ritchey et al. 2003).

Food neophobia can be introduced as a moderator in the Theory of Planned Behavior model to provide insights into food consumption intention. This inclusion provides more theoretical explanation to how existing predictors function to influence consumption intention (Perugini and Bagozzi, 2001).

The Food Neophobia Scale (FNS) has been widely used to measure food neophobia in individuals (Pliner and Salvy, 2006).

The FNS is a 10-item verbal instrument. There has been concern about the meaning and interpretation of individual FNS statements in different populations and cultures.

In Spain, scarce studies have been found reporting the validation of the FNS in Spanish language and adapting the FNS to the Spanish distinctive cultural traits (Villegas et al., 2008). An adapted version of the FNS has been developed which performed properly with Spanish consumers (Fernandez-Ruiz et al., 2012).

The adapted version of the Spanish FNS was developed in 2012 with data from a survey of 309 observations carried out in Madrid, Barcelona and Valencia. The table 2 shows the demographic variables and their breakdown among the respondents.

Demographic variables and their breakdown among respondents (n = 309).					
Characteristic	Breakdown	Total sample	Madrid	Barcelona	Valencia
Gender	Male	136 (44%)	64 (48%)	37 (39%)	35 (43%)
	Female	173 (55%)	69 (52%)	58 (61%)	46 (57%)
Age Groups	1: <25	50	41	2	7
	2: 25–36	70	24	16	30
	3: 37–48	82	22	38	22
	4: 49–60	64	30	19	15
	5: >60	43	16	20	7
Total of participants		309	133	95	81

Table 2: Demographic variables and their breakdown among the respondents (n=309)
Source: Fernandez-Ruiz et al., 2012

This paper will use the proposed Spanish version of the FNS.

Hypotheses

The Theory of Planned Behavior, with the introduction of food neophobia as an extension, has been applied in the past to establish food consumption intention in the past, but it has mainly been applied to the adoption of organic food or green food (Mcdermott et al., 2015) or to the intention to consume traditional food products of one's province (Visintin et al., 2012).

Using the Theory of Planned Behavior, the following directional hypotheses can be proposed to test the effect of attitude, subjective norm and perceived behavioral control towards consuming insect-based products:

Hypothesis 1

Attitude towards consuming insect-based products has positive effect on intention towards adopting insect-based products.

Hypothesis 2

Subjective norm towards consuming insect-based products has positive effect on intention towards adopting insect-based products.

Hypothesis 3

Perceived behavioral control towards consuming insect-based products has positive effect on intention towards adopting insect-based products.

On the other hand, introducing food neophobia can assess its moderating effect on the consumption intention of insect-based products.

It is not known how food neophobia would affect the relationships under investigation. Hence, the following 3 hypotheses will be introduced, to assess each one of the relationships.

Hypothesis 4

The relationship between attitude and intention towards consuming insect-based products is moderated by food neophobia.

Hypothesis 5

The relationship between subjective norm and intention towards consuming insect-based products is moderated by food neophobia.

Hypothesis 6

The relationship between perceived behavioral control and intention towards consuming insect-based products is moderated by food neophobia.

The relationship between the proposed hypotheses can be seen in figure 3:

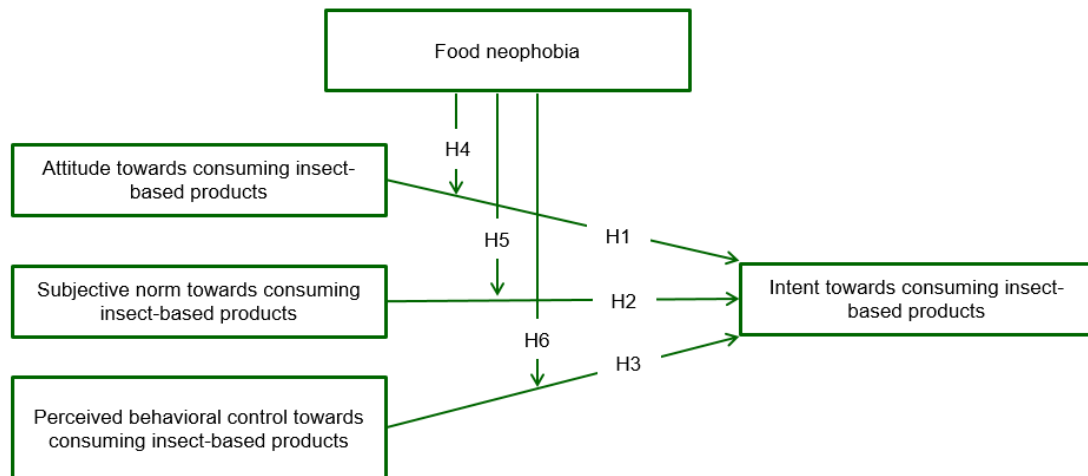


Figure 3: Illustration of the Hypotheses
Source: Own elaboration

3. Methodology

Sample and data collection

During the last decade, the Theory of Planned Behavior has been applied to many studies regarding human food consumption. One of the most researched areas has been the prediction of organic food consumption (Scalco et al., 2017).

In 2016 Scalco et al. conducted a meta-analysis of papers that had applied the Theory of Planned Behavior as a theoretical framework to understand and predict consumers' motivation to buy organic food. The results suggested the robustness of the application of the Theory of Planned Behavior model to the prediction of organic food consumption.

To survey the studies Scalco et al. queried the databases Scopus, Web of Science, and PsychINFO during March 2016, using the following terms and combinations as research keys in titles, keywords and abstracts: ("theory of planned behav*" OR "planned behav*" OR "Ajzen") AND ("purchas*" OR "recycled" OR "nontoxic" OR "eating" OR "organic" OR "green food" OR "sustainable").

From this survey Scalco et al. identified 1174 records in the databases. Through a process of elimination of duplicates, exclusion of irrelevant papers and inclusion of new records from the review of the selected references, 17 relevant papers were included in the meta-analytic process. Since some studies had multiple samples, the number of studies added up to a total of 23 different studies.

From the sample size of the 23 studies shown in Table 3, the upper fence was calculated (949.5) and the outlier observations were eliminated (Zagata, 2012 and Vassallo et al., 2016).

From the remaining 21 observations, the average was found to be 352 observations while the median was found to be 270 observations.

Research ID	Sample size
01. Al-Swidi et al., 2014	184
02. Arvola et al., 2008 (study a/sample from IT)	202
03. Arvola et al., 2008 (study a/sample from UK)	270
04. Arvola et al., 2008 (study a/sample from FI)	200
05. Arvola et al., 2008 (study b/sample from IT)	202
06. Arvola et al., 2008 (study b/sample from UK)	270
07. Arvola et al., 2008 (study b/sample from FI)	200
08. Bamberg, 2002	320
09. Dean, Raats, & Shepherd, 2012 (study a)	501
10. Dean et al., 2012 (study b)	499
11. Dowd & Burke, 2013	137
12. Guido et al., 2010	207
13. Honkanen & Young, 2015	755
14. Lee, Bonn, & Cho, 2015	482
15. Lodorfos & Dennis, 2008	144
16. Onwezen et al., 2014 (study a)	944
17. Robinson & Smith, 2002	547
18. Sparks & Shepherd, 2002	261
19. Vassallo, Scalvedi, & Saba, 2016	2905
20. Vermeir & Verbeke, 2008	456
21. Yadav & Pathak, 2016	220
22. Yazdanpanah & Forouzani, 2015	389
23. Zagata, 2012	1054

Table 3: Sample size from meta-analysis study (Scalco et al., 2017)
Source: Own elaboration with data from Scalco et al., 2017

Additionally, a priori power analysis has been used to determine minimum sample size to ensure adequate statistical capacity to investigate and explain the variables under investigation. Alpha was set to 0.05 and power to 0.80. Due to the impossibility to conduct pilot studies, the effect size was extrapolated from published findings from similar studies with a value of 0.3 (medium). The total sample size applying a priori power analysis is 64, which is a smaller sample size than the one calculated from the 21 observations from the meta-analysis conducted by Scalco et al.

t tests – Correlation: Point biserial model		
Analysis:	A priori: Compute required sample size	
Input:	Tail(s)	= One
	Effect size ρ	= 0.3
	α err prob	= 0.05
	Power (1- β err prob)	= 0.80
Output:	Noncentrality parameter δ	= 2.5158836
	Critical t	= 1.6698042
	Df	= 62
	Total sample size	= 64
	Actual power	= 0.8005036

Table 4 Sample size determination with Power analysis
Source: Own elaboration using G*Power software

Based on the priori power analysis calculated and on the sample size of the most relevant papers that have applied the Theory of Planned Behavior as a theoretical framework to understand and predict consumers' motivation to buy organic food during the last decade in the meta-analysis research carried out by Scalco et al., the sample in this paper aims to be 300 observations.

The respondents must be, at least, partially responsible for the family's grocery shopping, and over the age of 18, as adolescents are still establishing their personal identity, so their moral and belief systems and their motivations behind food consumption may vary significantly compared to adults (Visintin et al. 2012).

The Survey is expected to be carried out in the metropolitan Area of Barcelona from the 4th September 2017 until the 22nd September 2017. The exact locations where the survey will be carried out has not yet been determined. The respondents will be given a paper-based survey by the researcher and will be given a maximum of 30 minutes to complete the survey. Participation in the survey will be optional and the respondents will not be compensated for the participation. Respondents will be asked to write the exact starting time and ending time. Surveys which are completed in less than 10 minutes will be disregarded.

A pilot study was carried out during the last week of May 2017 with 5 respondents at the Faculty of Economics and Business of the University of Barcelona. The socio-demographic characteristics of the pilot study (n = 5) can be seen in the table 5:

Socio-demographic characteristics				
Gender				
Male	40%			
Female	60%			
Age				
Age of respondents	mean	median	s.d.	
	27.0	25.0	3.81	
Place of birth				
European Union	60%			
Sout America	40%			
Years living in the province of Barcelona				
< than 1 year	60%			
> than 1 year	40%			
Education				
Has been enrolled at a university	100%			
Has not been enrolled at a university	0%			
Food constraints caused by religion				
Yes	0%			
No	100%			
Food constraints caused by medical condition				
Yes	0%			
No	100%			

Table 5: Sample socio-demographic characteristics (n = 5)
Source: Own elaboration

The complete replies of the 5 respondents is provided in Appendix 2.

Questionnaire

A paper-based questionnaire will be used (Arvola et al., 2008). To establish the representativeness of the surveyed sample, demographic information from the questionnaire will be compared with census information of the population in the province of Barcelona (Scalco et al., 2017).

The survey will be elaborated in English and then translated into Spanish by the author to be administered to the participants, to maximize the accuracy of the answers. The participants will anonymously complete the questionnaire and will be assured that all responses will remain confidential.

All the 3 variables measured (attitude, subjective norm and perceived behavioral control) and the moderation effect of food neophobia will be adapted from past literature (Kim et al., 2014), and will be analyzed by means of the Structural Equation Modelling, using partial least squares approach.

In previous studies, all key variables have been measured by multiple statements questionnaires. Except for demographic information, a seven-point Likert scale will be used (1 indicating strongly disagree to 7 indicating strongly agree) to measure the statements (Maloney et al., 2014).

Those previous studies measured the intention towards consuming organic food (Maloney et al., 2014), halal food (Alam and Sayuti, 2011), green food (Liobikienė et al., 2016) and local food (Shin et al., 2016).

All key variables will be measured by multiple statements, as this would afford greater degrees of freedom when partitioning the data into groups. It would also allow for adjustment of measurement error, thus increasing their reliability and predictive validity (Hair et al., 2012).

Except for demographic information, a seven-point Likert scale with 1 indicating strongly disagree to 7 indicating strongly agree will be adopted to measure the statements.

There is no standard Theory of Planned Behavior questionnaire. All the Theory of Planned Behavior components (attitude, subjective norm and perceived behavioral control), will be measured according to item development recommendations outlined by Fishbein and Ajzen (2010).

All the Food Neophobia components will be measured according to the Food Neophobia Scale (FNS) outlined by Pliner and Salvy (2006) and adapted to the Spanish language and customers by Fernandez-Ruiz et al. (2012).

Statistical analysis

All key variables will be measured by multiple statements, as this will provide greater degrees of freedom when partitioning the data into groups. It would also allow for adjustment of measurement error, thus increasing their reliability and predictive validity (Hair et al., 2014).

Structural equation modelling (SEM) using Partial Least Squares approach will be utilized to assess the relationships of variables under investigation and the moderation effect of food neophobia.

SEM is a multivariate statistical analysis technique that is used to analyze structural relationships.

SEM is an appropriate analysis technique to provide an understanding of the individual constructs and the cause–effect relations among all the constructs when a study has a predictive research goal and a relatively complex model (Hair et al., 2012).

Partial Least Squares (PLS-SEM) is a useful instrument to explain complex consumer behavior (Hair et al., 2012).

PLS-SEM is more suited for the present analysis instead of covariance-based SEM because food neophobia is not part of Theory of Planned Behavior and is adopted as the key construct to assess consumption intention in a relatively unfamiliar context (Hair et al., 2014).

Confirmatory factor analysis and scale validation

Although the chi-square test is the most common method for evaluating the goodness-of-fit of a model, this test is highly sensitive to sample size, especially with 300 observations. In these cases, it is recommended to evaluate the model by observing more than one indicator (Hair et al., 2012).

Thus, two different goodness-of-fit indices will be adopted. The first one is the chi-squared to d.f. ratio, in which a ratio smaller than 3 can be considered a reasonably good indicator of model fit. The second one is the root mean squared error approximation and the root mean square residual in which a result of less than 0.08 would indicate an acceptable level (Hair et al., 2012).

4. Provisional Results

It is expected that attitude, subjective norm and perceived behavioral control all will have a positive effect on consumption intention of new food items (Kim et al., 2014).

On the other hand, it is also expected that food neophobia will have just a moderation effect on the relationship between subjective norm and consumption intention (Kim et al., 2014).

The results presented here have a temporary and tentative nature and are subjected to change. The results are based on the data from the first 5 surveys carried out.

The pilot study did not only help in getting insight into the model proposed, but also to get feedback about the questions included in the survey, which allowed for some rewording and modifications of the questionnaire.

Table 6 shows the assessment of construct reliability and the convergent validity for the variables of the study. The composite reliability (CR) values of 0.816 (ATT), 0.886 (PBC), 0.861 (SN), 0.729 (FN) and 0.897 (INT) demonstrate that these constructs have high levels of internal consistency. Additionally, the variables in this study demonstrate good convergent validity.

All the constructs achieve a minimum threshold value of 0.5 for average variance extracted (AVE) which is an indication that the items explain more than 50 per cent of the construct's variances (Hair et al., 2014).

Construct	Item	Loading	CR	AVE
Attitude	ATT1	0.879	0.816	0.685
	ATT2	0.845		
	ATT3	0.810		
	ATT4	0.745		
	ATT5	0.803		
Subjective norm	SN1	0.901	0.861	0.796
	SN2	0.815		
	SN3	0.868		
	SN4	0.809		
	SN5	0.896		
Perceived behavioural control	PBC1	0.856	0.886	0.812
	PBC2	0.912		
	PBC3	0.890		
Food neophobia	FN1	0.790	0.729	0.562
	FN2	0.082		
	FN3	0.702		
	FN4	0.836		
	FN5	0.698		
	FN6	0.841		
	FN7	0.887		
	FN8	0.825		
	FN9	0.829		
	FN10	0.798		
Intention	INT1	0.925	0.897	0.786
	INT2	0.917		
	INT3	0.849		

Table 6: Internal consistency and convergent validity
Source: Own elaboration

Table 7 shows the assessment of discriminant validity. The diagonal elements represent the square root of the AVE. Off diagonal elements are simple bivariate correlations between the constructs and were not included in the table. Off diagonal elements values are lower than diagonal element values.

	ATT	INT	FN	PBC	SN
ATT	0.828				
INT		0.887			
FN			0.750		
PBC				0.901	
SN					0.892

Table 7: Assessment of discriminant validity
Source: Own elaboration

The square root of AVE of each construct is larger than the correlation estimates of the constructs. This indicates that all the constructs are distinctly different from one another,

implying that each construct is unique and captures phenomena not represented by other constructs in the model (Hair et al., 2014).

It is important to ensure that there is no collinearity in the structural model. Table 8 shows the outcome of the collinearity test. The VIF value for each of the constructs is much lower than 10 (which would indicate extremely high collinearity) and even lower than 4 (which would warrant further investigation). The values are not particularly close to 1 (which would mean no collinearity issues), so we can conclude that there's shallow multicollinearity which at the moment does not warrant further investigation.

	INT
ATT	2.214
FN	1.954
PBC	1.830
SN	1.527

Table 8: Collinearity assessment
Source: Own elaboration

According to the schedule for the completion of the study, the surveys will be carry out from the 4th September until the 22nd September.

From the 25th September until the 13th October the data collected will be analyzed by the researcher with the supervision of the director assigned.

With the outcome of that analysis, the Results section will be expanded and completed. It is expected that by the 27th October the Results sections will be completed and, therefore, the research will be completed.

5. Conclusions

The Theory of Planned Behavior is useful to explaining the effects of attitude, subjective norm and perceived behavioral control in understanding the intention of consuming new food items (Mcdermott et al., 2015).

The effects of attitude, subjective norm and perceived behavioral control on the intention towards consuming novel foods in general, and insect-based products in particular, is expected to be significant (Kim et al., 2014).

The moderating effect of food neophobia on the relationship between subjective norm and consumption intention is also expected to be significant, although with a different magnitude depending on the group age (Arvola et al., 2008).

Research implications

To understand the consumers' specific beliefs about consuming insect-based products will advance the academic knowledge regarding the consumer's consumption intention and the moderating effect of food neophobia as an antecedent included in the theory of planned behavior.

Practical implications

The food producers and distributors, as well as the service industry would benefit from the understanding about how people decide to adopt new foods. A clear understanding of this process could help these industries adapt to the new food tastes and even to anticipate them.

The farming industry could also benefit from this study, especially the insect farm start-ups which have been increasing in number during the last years.

Finally, this study could also contribute to the legislation of insect-based products in the European Union, and to the research which is currently being carried out to include insect-based products in the list of approved novel foods.

Contribution

This study will introduce a deepening of the Theory of Planned Behavior by incorporating food neophobia as a moderator in the model to provide additional theoretical explanation to the consumer intention to adopt insect-based products.

Research limitations

Future research should be done in less cosmopolitan areas of Catalonia, to understand whether the same willingness to try unfamiliar foods is found in those areas.

On the other hand, the research could be extended to different countries to gain a global understanding on the subject matter.

Another limitation of this study is that the correspondence between self-reported behavioral intention and actual or observed behavior is not always perfect (Belk, 1985). Future studies should further investigate actual behaviors through observation or interviews.

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Appendix 1: Questionnaire development

The questionnaire has 33 questions divided into 3 main categories (Demographics, Theory of Planned Behavior and Food Neophobia).

The questions in the Demographics section have been adapted from previous literature applying the Theory of Planned Behavior on the consumption of organic food.

The questions in the Theory of Planned Behavior section have been adapted from previous literature and will be measured according to item development recommendations outlined by Fishbein and Ajzen (2010).

The questions in the Food Neophobia section follow the Food Neophobia Scale developed by Pliner and Salvy, (2006) and the adapted version of the Food Neophobia Scale to the Spanish consumers by Fernandez-Ruiz et al. (2012).

The questionnaire development was a long and arduous undertaking. Multiple versions were developed, examined and fine-tuned during the process.

The initial version had 45 questions (5 questions for the Demographics section, 40 questions for the Theory of Planned Behavior section and 10 questions for the Food Neophobia section).

Two of the five participants who replied to the final version of the questionnaire (hereby called Participant 1 and Participant 2) also provided feedback about the structure of this early version of the questionnaire.

Below the final version of the questionnaire will be included. It will include comments about how certain questions looked like in the initial version, and how and why they were modified, as well as an explanation regarding why some questions were removed and yet other questions added to the final version of the questionnaire. It also includes the code for each question and the how it is measured, including the scale and range.

Demographics

Construct	Question #	Code	Question text	Scale
Demographics	1	DEM1	What was your age on your last birthday?	It must be 2 digits, from 18 to 99
	2	DEM2	Are you a male, female or Agender?	(1) male (2) female (3) agender
	3	DEM3	What's your place of birth?	(1) EU (2) Asia (3) Africa (4) S. America (5) Other
	4	DEM4	Have you been living in the province of Barcelona for more than one year?	(1) yes (2) no
	5	DEM5	Have you ever been enrolled at a university?	(1) yes (2) no
	6	DEM6	Does your religion or spiritual beliefs prevent you from eating of insect-based food?	(1) yes (2) no
	7	DEM7	Do you have a medical condition which prevents you from eating of insect-based food?	(1) yes (2) no

Table 9: Questionnaire (Demographics Section)
Source: Own elaboration

The demographics section in the initial version had 5 questions (DEM1 to DEM5). DEM6 and DEM7 were included thanks to a remark by Participant 2 which draw my attention to what would happen if a Participant was vegetarian or vegan.

Initially DEM1 was formulated differently (How old are you?). However, this question might have been answered incorrectly due to the tendency of some participants to round-up or round-down their age.

Theory of Planned Behavior: Intent

Construct	Question #	Code	Question text	Scale (worst)	Scale (best)	Range
INT	8	INT1	For sure I will try to eat insect-based products when they are available	strongly disagree	strongly agree	(1 to 7)
	9	INT2	I would try insect-based products if I visit a place where they are available	strongly disagree	strongly agree	(1 to 7)
	10	INT3	If at a dinner party all guests are trying insect-based products, how likely are you to try it?	extremely unlikely	extremely likely	(1 to 7)

Theory of Planned Behavior: Attitude

Construct	Question #	Code	Question text	Scale (worst)	Scale (best)	Range
ATT	11	ATT1	Overall, consuming insect-based products would be	bad	good	(1 to 7)
	12	ATT2	Overall, consuming insect-based products would be	unsafe	safe	(1 to 7)
	13	ATT3	Overall, consuming insect-based products would be	undesirable	desirable	(1 to 7)
	14	ATT4	Overall, consuming insect-based products would be	detrimental	beneficial	(1 to 7)
	15	ATT5	Overall, consuming insect-based products would be	unpleasant	pleasant	(1 to 7)

Theory of Planned Behavior: Subjective Norm

Construct	Question #	Code	Question text	Scale (worst)	Scale (best)	Range
SN	16	SN1	Most people who are important to me think that I should eat insect-based products	strongly disagree	strongly agree	(1 to 7)
	17	SN2	My friends would approve of me eating insect-based products	extremely unlikely	extremely likely	(1 to 7)
	18	SN3	My family think that I should try insect-based products	strongly disagree	strongly agree	(1 to 7)
	19	SN4	Generally speaking, how relevant is the opinion of your friends?	extremely irrelevant	extremely relevant	(1 to 7)
	20	SN5	Generally speaking, how relevant is the opinion of your family?	extremely irrelevant	extremely relevant	(1 to 7)

Theory of Planned Behavior: Perceived Behavioral Control

Construct	Question #	Code	Question text	Scale (worst)	Scale (best)	Range
PBC	21	PBC1	The decision to eat insect-based products is under my complete control	strongly disagree	strongly agree	(1 to 7)
	22	PBC2	Having insect-based products in the supermarket would make it easier eat these products	strongly disagree	strongly agree	(1 to 7)
	23	PBC3	Eating insect-based products is compatible with the local food culture	strongly disagree	strongly agree	(1 to 7)

Table 10: Questionnaire (Theory of Planned Behavior Section)
Source: Own elaboration

The Theory of Planned Behavior section in the initial version had 40 questions. Participant 2 draw my attention to the fact that it was time-consuming and repetitive. When asked about this, Participant 1 agreed about the section being too long and time-consuming to complete.

Another difference in the initial version of the questionnaire was with the order of the scale. In the final version, we can see that the worst case is always on the left, while the best case is always on the right, this implies that it's measured from worst (1) to best (7).

In the initial version, however, the questions were formulated in a way that the answer was measure the other way around, that is from best (1) to worst (7).

This inconsistent measurement system was criticized by both Participants.

Food Neophobia						
Construct	Question #	Code	Question text	Scale (worst)	Scale (best)	Range
FN	24	FN1	I am constantly sampling new and different foods	strongly disagree	strongly agree	(1 to 7)
	25	FN2	I trust new foods	strongly disagree	strongly agree	(1 to 7)
	26	FN3	I can try a food only if I know well what it is	strongly disagree	strongly agree	(1 to 7)
	27	FN4	I like foods from different cultures	strongly disagree	strongly agree	(1 to 7)
	28	FN5	Ethnic food looks weird to eat	strongly disagree	strongly agree	(1 to 7)
	29	FN6	At dinner parties, I will try new foods	strongly disagree	strongly agree	(1 to 7)
	30	FN7	I am afraid to eat things I have never had before	strongly disagree	strongly agree	(1 to 7)
	31	FN8	I am very particular about the foods I eat	strongly disagree	strongly agree	(1 to 7)
	32	FN9	I will eat almost everything	strongly disagree	strongly agree	(1 to 7)
	33	FN10	I like to try ethnic restaurants	strongly disagree	strongly agree	(1 to 7)

Table 11: Questionnaire (Food Neophobia Section)
Source: Own elaboration

The Food Neophobia section didn't undergo major changes through the whole process. This is due to the fact that it follows the Food Neophobia Scale developed by Pliner and Salvy.

Appendix 2: Questionnaire responses (n = 5)

In table 12 the final questionnaire is shown, with all the answers from the 5 Participants.

Demographics

Construct	Question #	Code	Question text	Scale	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Demographics	1	DEM1	What was your age on your last birthday?	It must be 2 digits, from 18 to 99	25	32	25	30	23
	2	DEM2	Are you a male, female or Agender?	(1) male (2) female (3) agender	1	2	2	2	1
	3	DEM3	What's your place of birth?	(1) EU (2) Asia (3) Africa (4) S. America (5) Other	1	4	4	1	1
	4	DEM4	Have you been living in the province of Barcelona for more than one year?	(1) yes (2) no	2	2	2	2	1
	5	DEM5	Have you ever been enrolled at a university?	(1) yes (2) no	1	1	1	1	1
	6	DEM6	Does your religion or spiritual beliefs prevent you from eating of insect-based food?	(1) yes (2) no	2	2	2	2	2
	7	DEM7	Do you have a medical condition which prevents you from eating of insect-based food?	(1) yes (2) no	2	2	2	2	2

Theory of Planned Behavior: Intent

Construct	Question #	Code	Question text	Scale (worst)	Scale (best)	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
INT	8	INT1	For sure I will try to eat insect-based products when they are available	strongly disagree	strongly agree	2	1	1	2	2
	9	INT2	I would try insect-based products if I visit a place where they are available	strongly disagree	strongly agree	2	1	2	2	2
	10	INT3	If at a dinner party all guests are trying insect-based products, how likely are you to try it?	extremely unlikely	extremely likely	4	1	2	3	2

Theory of Planned Behavior: Attitude

Construct	Question #	Code	Question text	Scale (worst)	Scale (best)	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
ATT	11	ATT1	Overall, consuming insect-based products would be	bad	good	3	2	5	4	3
	12	ATT2	Overall, consuming insect-based products would be	unsafe	safe	4	2	6	4	4
	13	ATT3	Overall, consuming insect-based products would be	undesirable	desirable	1	1	2	2	1
	14	ATT4	Overall, consuming insect-based products would be	detrimental	beneficial	3	1	5	2	3
	15	ATT5	Overall, consuming insect-based products would be	unpleasant	pleasant	1	1	1	2	2

Theory of Planned Behavior: Subjective Norm

Construct	Question #	Code	Question text	Scale (worst)	Scale (best)	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
SN	16	SN1	Most people who are important to me think that I should eat insect-based products	strongly disagree	strongly agree	1	3	2	3	2
	17	SN2	My friends would approve of me eating insect-based products	extremely unlikely	extremely likely	4	6	3	3	4
	18	SN3	My family think that I should try insect-based products	strongly disagree	strongly agree	1	2	1	2	2
	19	SN4	Generally speaking, how relevant is the opinion of your friends?	extremely irrelevant	extremely relevant	5	4	3	3	4
	20	SN5	Generally speaking, how relevant is the opinion of your family?	extremely irrelevant	extremely relevant	6	4	4	5	5

Theory of Planned Behavior: Perceived Behavioral Control

Construct	Question #	Code	Question text	Scale (worst)	Scale (best)	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
PC	21	PBC1	The decision to eat insect-based products is under my complete control	strongly disagree	strongly agree	6	7	3	6	3
	22	PBC2	Having insect-based products in the supermarket would make it easier eat these products	strongly disagree	strongly agree	2	5	3	4	2
	23	PBC3	Eating insect-based products is compatible with the local food culture	strongly disagree	strongly agree	4	2	2	4	4

Food Neophobia

Construct	Question #	Code	Question text	Scale (worst)	Scale (best)	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
FN	24	FN1	I am constantly sampling new and different foods	strongly disagree	strongly agree	5	1	3	4	4
	25	FN2	I trust new foods	strongly disagree	strongly agree	4	5	3	6	4
	26	FN3	I can try a food only if I know well what it is	strongly disagree	strongly agree	6	6	3	3	4
	27	FN4	I like foods from different cultures	strongly disagree	strongly agree	3	3	3	4	6
	28	FN5	Ethnic food looks weird to eat	strongly disagree	strongly agree	4	4	4	3	3
	29	FN6	At dinner parties, I will try new foods	strongly disagree	strongly agree	2	5	3	1	5
	30	FN7	I am afraid to eat things I have never had before	strongly disagree	strongly agree	3	2	3	5	2
	31	FN8	I am very particular about the foods I eat	strongly disagree	strongly agree	4	3	3	6	4
	32	FN9	I will eat almost everything	strongly disagree	strongly agree	5	6	3	6	5
	33	FN10	I like to try ethnic restaurants	strongly disagree	strongly agree	6	4	3	4	6

Table 12: Questionnaire responses (n = 5)
Source: Own elaboration

Appendix 3: Forecast for the completion of the study

SEPTEMBER 2017											
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday					
				1	2	3					
4	Carry out the paper-based survey	5	Carry out the paper-based survey	6	Carry out the paper-based survey	7	Carry out the paper-based survey	8	Carry out the paper-based survey	9	10
11	Carry out the paper-based survey	12	Carry out the paper-based survey	13	Carry out the paper-based survey	14	Carry out the paper-based survey	15	Carry out the paper-based survey	16	17
18	Carry out the paper-based survey	19	Carry out the paper-based survey	20	Carry out the paper-based survey	21	Carry out the paper-based survey	22	Carry out the paper-based survey	23	24
25	Analyze the results from the survey	26	Analyze the results from the survey	27	Analyze the results from the survey	28	Analyze the results from the survey	29	Analyze the results from the survey	30	

OCTOBER 2017											
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday					
						1					
2	Analyze the results from the survey	3	Analyze the results from the survey	4	Analyze the results from the survey	5	Analyze the results from the survey	6	Analyze the results from the survey	7	8
9	Analyze the results from the survey	10	Analyze the results from the survey	11	Analyze the results from the survey	12	Analyze the results from the survey	13	Analyze the results from the survey	14	15
16	Complete the Results Section	17	Complete the Results Section	18	Complete the Results Section	19	Complete the Results Section	20	Complete the Results Section	21	22
23	Complete the Results Section	24	Complete the Results Section	25	Complete the Results Section	26	Complete the Results Section	27	Complete the Results Section	28	29

Table 13: Forecast for the completion of the study
Source: Own elaboration