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**THE ROLE OF PSYCHOLOGICAL DETERMINANTS OF FREE-
FROM FOOD CONSUMPTION: RESULTS FROM A MIXED
METHODS STUDY ON THE ITALIAN POPULATION**

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“Ut quod ali cibus est aliis fuit acre venenum”

“What is food to one is bitter poison to another”

Lucretius, ca. 96 B.C.–55 B.C. *De Rerum Natura*, Book IV, line 637

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FOREWORD

I'd like to think of the doctoral project as being the result - not linear - of our training path, our research interests, our meetings, our passions and - why not - dreams and desires perhaps hidden even more in depth. I'd like to think about the research object we choose, or that happens to us, or that someone decides for us, as a symbol to which we are somehow connected.

In my case it is.

This PhD project is the result of my past experiences and the starting point for my future, wherever it leads. In fact, it is conceptually positioned on the border between health issues, in which I took my first steps as researcher, in a hesitant exploration, and food, in which I launched myself with confidence. It has gradually built up over these three years when, as a research group, we naively questioned the phenomena that invaded our shopping carts, our tables, our Social Media pages, our WhatsApp groups at 7 am.

Undoubtedly the theme of food intolerances and "free-from" consumptions is at the center of the scientific debate, as will be explained later, and in the nightmares (or dreams) of some actors of the food system. But most of all, this phenomenon is questioning us, the consumers, expressing new ways of thinking and acting different from the past.

This thesis project is born therefore from our irresistible desire to explore what is behind changes, trends, and behaviours; to squeeze to the bottom of our data, to make them talk, to explain the whys of things when are apparently unexplained. This is what I will try to describe in this thesis and that will be of interest - to anyone who will read it - to learn more about this phenomenon or to guide future actions on the topic of food consumption and healthy lifestyle.

THESIS RATIONALE

1. Background

Adverse reactions to foods are not new and have been described for two thousand years. The ancient Greek physician, Hippocrates, described a reaction to milk in the 1st century. Anaphylactic reactions to egg and fish have been described as earlier as the 16th and 17th century.

Food allergies and intolerances are adverse reactions that plague a large number of people. It is estimated as, in the last 2 or 3 decades, food adverse reactions are affecting up to 20% of the global population, with a major incidence in the industrialized countries and in children (Loh & Tang, 2018).

Although symptoms are manifested in only a relatively small segment of the total population, food adverse reactions are perceived as a major health concern for two main reasons. First because, even if solid data are becoming more and more available, their determination remains elusive due to different manifestations, severities and methodologies available to detect them. Second, because self-reported diagnosis rates are substantially higher than those confirmed by the medically supervision.

Among the others, gluten and lactose intolerances are the most diffused (Aizi, 2018; Di Costanzo, Berni Canani, 2019). They are considered one of the newest contribution of food science in developing foods to better fit into modern needs of the last 50 years (Munday & Bagley, 2017). Agricultural and nutritional sciences are focusing their attention to these foods in order to find new ways to innovate food offer in the light of the global environmental, economic and health challenges. Food industries, on their hand, have identified in these foods a potential area of innovation in the food market arena. Consumers, finally, turn to

gluten- and lactose-free foods - regardless their medical condition - to express new values and expectations.

Data from the international and national market, indeed, are confirming a rapid increase of these foods, up to become a real trend rooted in consumption habits. The Italian context, in particular, represents an interesting stage where to observe those market movements. However, evidences are challenging the Italian food scenario. Free-from foods are more expensive compared to the “normal” ones, as they need more industrial investments, bringing also economical and environmental consequences. Moreover those foods move people far from some of those considered cornerstones of Mediterranean culture such as milk and bread, with profound changes in people’s habits. Consequences of this food regimen on a healthy population are under discussion, both from nutritional perspective and broader quality of life (Sicherer & Sampson, 2018). These evidences are still not perceived as a barrier for the spread of “free-from” diets.

However, these structural constraints related to gluten- and lactose-free diets seem not to discourage people from undertaking this choice, thus suggesting that the motivations are strongly rooted in something deeper. In this direction, the psychological and symbolic interpretation of these foods may be a key to understanding consumer conduct.

2. Aims

Having these premises in mind, this dissertation propose a mixed-methods research aimed at exploring to explore the psychological determinants of gluten- and lactose-free diets among Italian consumers, with a main focus on tolerant consumers.

The main objectives can be defined as follow:

- Make a preliminary exploration of the scientific debate in order to provide a conceptual model to understand consumption behaviours of gluten-free and lactose-free food consumption, differentiated between tolerant and intolerant people;
- Track the psychological process characterizing voluntary change of diet from “traditional” to lactose- and gluten-free, conceptualizing it in terms of phases of change, variables involved and levers;
- Propose a first quantitative exploration of the this phenomenon on the Italian population, describing psychological characteristics of “free-from” consumers;
- Discuss preliminary results in terms of practical implications for consumer education in food consumption.

3. Methods

A mixed-methods research design is proposed and structured as follows (Figure 1).

In CHAPTER 1 the author will move through the latest food trends and related challenges, both for the public health sector and for consumers. Moreover, the author will summarize the current knowledge about adverse food reactions related to the consumption of gluten and lactose. Finally, some conclusions will be drawn and urgent research goals defined in order to understand better the consumers’ perspective.

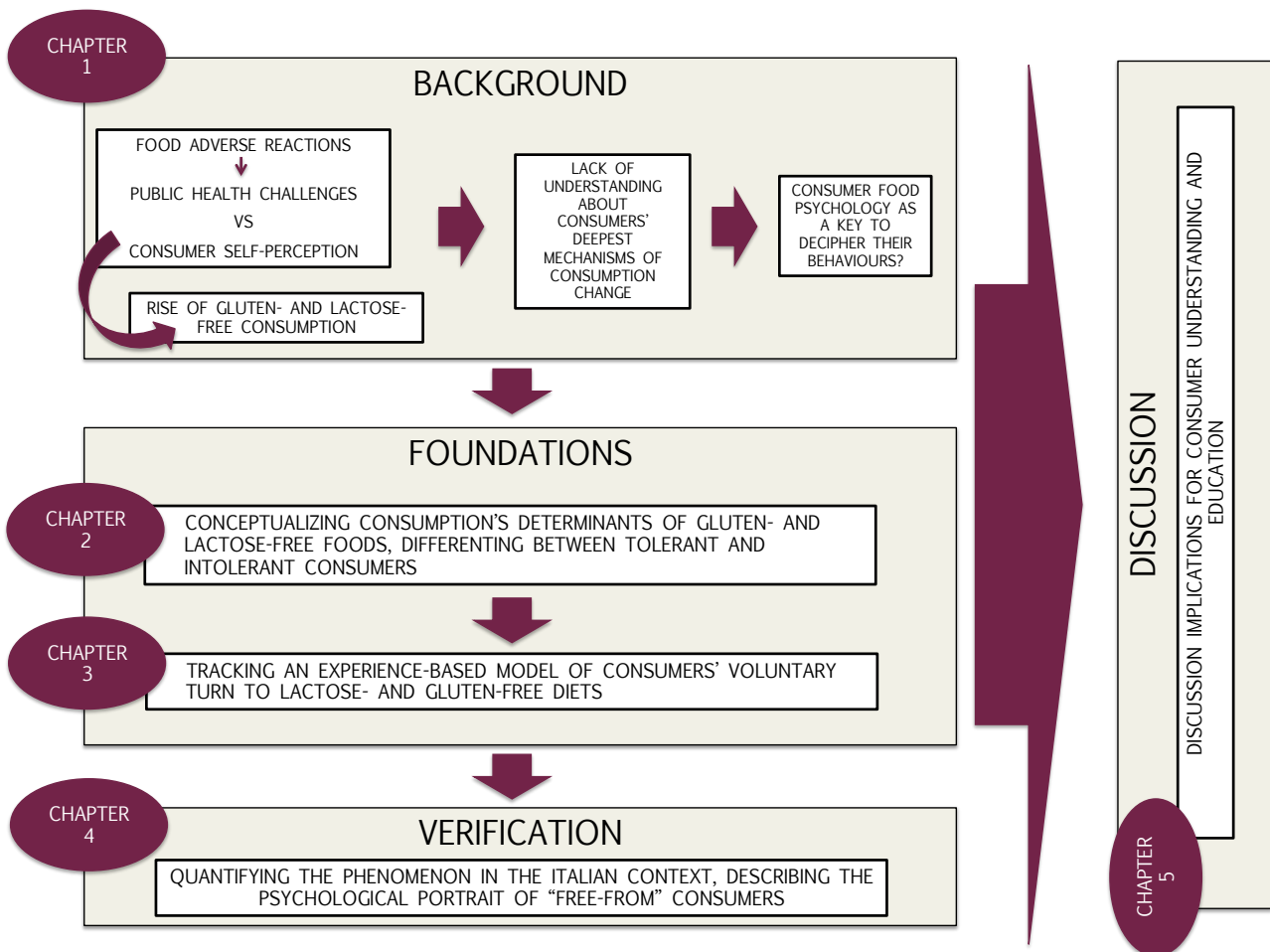
In CHAPTER 2 results of Integrative Systematic Review aimed at mapping the scientific debate around “free-from” products will be described; moreover a conceptual model to understand gluten-free and lactose-free food consumptions’ behaviours, differentiated between tolerant and intolerant people, will be proposed.

In CHAPTER 3 the author will go in depth in exploring consumers' voluntary dietary change towards lactose- and gluten-free foods, through a qualitative study based on the principles of a Grounded Theory approach. An experience-based model of psychological process will be tracked.

In CHAPTER 4 the author will propose a first quantitative exploration of this phenomenon on the Italian population, describing a psychological portrait of “free-from” consumers.

In CHAPTER 5, concluding remarks about the role of consumer health psychology in understanding today's consumers' behaviours in food consumption and related practical implications are discussed.

Figure 1. Thesis rationale



4. References

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CHAPTER ONE

GLUTEN- AND LACTOSE-FREE DIETS, BETWEEN FACTS AND MYTHS: DISENTANGLING THE CURRENT FOOD SCENARIO

Abstract

In the current food situation, the spotlight is on gluten- and lactose-free foods. The estimated increase in the adverse reactions from food, along with consumers' desires to pursue healthier diets, are raising questions for people about the role of gluten and lactose in their food habits.

Food intolerance is today recognized as particularly controversial for the medical community given that there is a lack of univocal guidelines for a proper diagnosis. This makes treatment for food intolerance difficult, thus putting a social and economic burden on the public health sector as well as restrictions on people's lifestyles. Moreover, in a context like Italy, the sudden and deep change in consumer diets is bringing about critical changes economically and culturally. At a structural level, the phenomenon of increasing gluten- and lactose-free diets seems to be inexplicable from an explicit point of view, which highlights the potential role of psychological processes behind the diagnosis of food ailments, some of which need to be explored.

In this chapter, the aim is to disentangle some of the aspects and challenges related to the phenomena of food intolerance and gluten- and lactose-free food consumption, all in order to highlight potential research gaps and opportunities for thinking about consumer psychology.

1. Introduction

Nowadays, we are seeing an increasing attention to gluten- and lactose-free foods, and this appears to be not only a new food trend but also the tip of the iceberg of broader consumers orientations that need to be explored.

In Western countries, an estimated one-fifth of the population believe that they have symptomatic reactions to foods, such as food intolerance, and this has increased in the last few decades (Turnbull, Adams, & Gorard, 2015). However, the determination of food intolerance remains elusive because of the many ways it can manifest itself, because of the difference in severities of these maladies, and because of the complex definitions of them (Sicherer & Sampson, 2018). Given all of this, self-reported food intolerance diagnosis rates are substantially higher than those confirmed by medical tests (Nwaru et al., 2014; Sicherer & Sampson, 2018). Along with that, the greater public awareness around the importance of healthy diets and the broader media coverage and about these topics have contributed to a movement in “free from” foods consumption, in particular gluten- and lactose-free foods (National Academies of Sciences, Engineering, and Medicine, 2017). Indeed, the agency Mordor Intelligence reported that in the last year, the growth of the global “free-from” market will be at a compound annual growth rate (CAGR) of nearly 5% from 2018 through 2023, with gluten-free and lactose-free products dominating the market (Mordor Intelligence, 2018). Countries like the United States, the United Kingdom, Italy, Germany, France, Spain, and Canada are some of the leading markets in the gluten-free category, whereas dairy-free is led by North America (Mordor Intelligence, 2018) (See Figure 1.1).

Figure 1.1 Free From Foods Market size, by Region, Global, 2018 – Source Mordor Intelligence



In this situation, however, scholars have recently pointed out some controversial health-related aspects of the consumption of gluten- and lactose-free foods, both physically and in terms of quality of life (Arias-Gastelum, Cabrera-Chávez, Vergara-Jiménez, & Ontiveros, 2018; Casellas, Aparici, Pérez, & Rodríguez, 2016; Vici, Belli, Biondi, & Polzonetti, 2016; Wünsche, Lambert, Gola, & Biesalski, 2018), in particular, when the target is tolerant consumers (Christoph, Larson, Hootman, Miller, & Neumark-Sztainer, 2018; Gaesser & Angadi, 2012; Niland & Cash, 2018). The unpredictable drift towards some product categories, in conclusion, risks turning people away from what is considered a healthy and adequate diet. For these reasons, it appears important to describe the current food situation in order to clarify some fundamental aspects related to this phenomenon and to frame the aims of this dissertation.

In Chapter 1, in fact, the author will move through the latest food trends and related challenges, both for the public health sector and for consumers. Moreover, the author will summarize the current knowledge about adverse food reactions related to the consumption of gluten and lactose. Finally, some

conclusions will be drawn and urgent research goals defined in order to understand better the consumers' perspective.

2. Consumers, Health institutions, and Companies: the Triad around “Free From” Foods Consumption

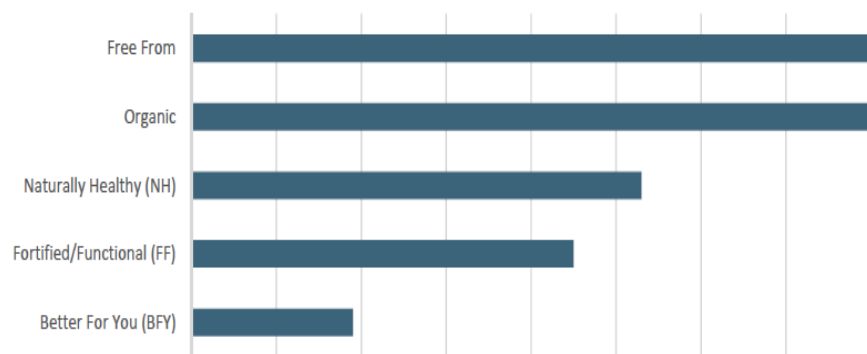
Consumers, food manufacturers, and health professionals are uniquely at the center of the growing phenomenon of “free from” diets. Consumer expectations for healthier diets have moved the food industry to adjust continuously and improve the formulations and processing techniques used in “free from” product manufacturing, all while still maintaining food quality and safety. Health experts have been interested in the nutritional adequacy of these diets as well as their effectiveness in managing food-related disorders and other conditions (El Khoury, Balfour-Ducharme, & Joye, 2018). New frontiers in the nutritional sciences, indeed, have led consumers to move from considering food as something for survival and hunger satisfaction to considering food as a source of global wellbeing and of a healthier lifestyle. The rapid increase in consumer awareness and the great interest in the roles of health improvement for specific foods and physiologically active food components is a trend caused by the convergence of various critical factors. In the following paragraphs, the author will focus on the main challenges related to this phenomenon from the different perspectives of the main actors involved.

2.1 Consumer Demand for “Free From” Products

It is certainly the case that consumers today are looking for healthier foods to satisfy their nutritional needs and meet with their personal values. Recent market trends show that, among the most diffused food choices, the “free from”

market is now the one gaining more attention. A recent analysis by the agency Euromonitor International (2017) shows that “free from” food, in particular those foods “free from” gluten and lactose, is globally the primary market within the health and wellness movement (Figure1.2).

Figure 1.2 Global Health and Wellness food related trends – Source Euromonitor International 2017



In the past ten years, indeed, “free from” foods have slowly become mainstream food products. Once relegated to the market for those with food allergies and other intolerances, modern consumers are turning to “free from” foods for an array of reasons. Not only are consumers becoming increasingly aware about the food they choose, such as what it contains and the processes behind its manufacturing, but there are also wider concerns regarding animal welfare and environmental sustainability and mostly health. Focusing on Europe, the countries with the highest turnover toward “free from diets,” in order, are Italy, the United Kingdom, Germany, and France. As a matter of fact, in recent years, European business in “free from” products has increased 5.1% and obtained a sales volume of 2.022 million euros (Euromonitor, 2017). According to Statista European’s (2019) “free from” market data (2017 to 2027), 68% of consumers have bought dairy/lactose free milk, while 59% have bought gluten-

free pasta. This trend, which is on the uptick, is framed into a change in consumers' attitudes toward the role of food in their broader life, moving from the need to make up for nutrient deficiencies to being a way to prevent chronic diseases and, further, to being an expression of personal and social values. Sustainability, social welfare, and animal welfare drive food choices more than ever before (e.g., fair trade, vegetarian, local, and organic food choices). Health concerns have also changed, together with the concept of health benefits, in relation to food (Woodside et al., 2019). For example, gluten-free or lactose-free products are food choices that go beyond the treatment of coeliac disease or lactose intolerance, since they are more related to having a proper lifestyle. In a recent online article, Schierhorn (2018) explained some reasons why the gluten free diet "is here to stay." Among consumers, millennials in particular, it is possible to find reasons related to energy improvement (34%), naturalness (31%), mood stabilization (13%), or skin treatment (12%), but the data appear similar also in the non-millennial population. These motivations are not simply about self-care or health. Moreover, in a context where consumers claim more and more for their presence and active participation in their own consumption choices, personalized nutrition appears now to be key, and consumers want to have last word into their food choices as a way of empowerment and self-determination (Timmermann, Félix, & Tittonell, 2018). However, along with these new consumer orientations, consumers are more interested in and more exposed than ever before to information about food and nutrition, which does not always lead to proper knowledge or better awareness. Nowadays, due also to the spread of social media to communicate and share information, consumers are highly exposed to misinformation and confusion. An example in the area of gluten- and lactose-free food consumption is related to the proliferation of home test kits for diagnosis, the scientific and medical basis of which is disputable and which nevertheless motivates individual decisions about the avoidance of certain foods. In a recent review (Zečević & Koklic, 2019) discussed the concept of "consumer

confusion” in relation to healthy foods. Consumer confusion is a relatively new area of researcher interest in marketing and consumer psychology. It has been defined as “a state of mind which affects information processing and decision making; the consumer may therefore be aware or unaware of confusion” (Mitchell & Papavassiliou, 1999, p. 327), while it can be also defined “as consumer failure to develop a correct interpretation of various facets of a product/service, during the information processing procedure” (Turnbull, Leek & Ying, 2000, p. 145). In this contribution, in particular, the author highlights the way that the ability of consumers to make genuine healthy food choices may be compromised by confusion arising from information they get from the media, governments, experts, food companies, and their peers in a way that is often misleading or contradictory (Liu et al., 2017). In the case of food consumption, indeed, the amount of information is not sufficient to contribute to adequate and balanced choices, but on the contrary could lead to the opposite result. Another example is the paradoxical impact that food labeling can have on consumer choices. The use of low-fat and low-energy labels or, as in the case of “free from” foods, could lead to over-consumption if these foods are perceived as healthier, even if the nutritional benefits are widely discussed in the medical literature. In this case, healthier foods can be rejected if they are found to be less tasty and more expensive. Moreover, authors have previously argued that food choices are not just about the information one receives since other hidden symbolic and interpretative dimensions are involved (Sütterlin & Siegrist, 2015). It is clear, finally, as the complexity of consumers’ behaviors in food choices is nowadays challenging and that traditional interpretation lenses of information and literacy appear insufficient to establish a dialog with them.

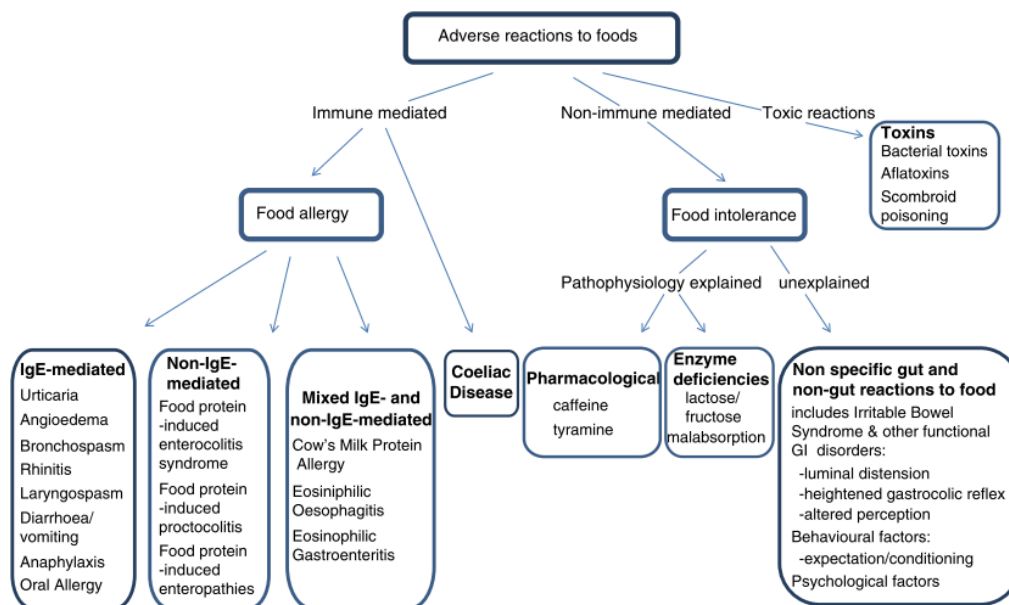
2.2 Public Health Institutions Face a “Free From” Food Pandemic

Although firm data are lacking, there is a strong impression that adverse food reactions have increased in the last two to two decades in up to 20% of the global population, especially in the industrialized and Westernized regions. This consideration carries relevant repercussions about dietary habits, health, and other psychological aspects (De Silva et al., 2014; Turnbull, Adams, & Gorard, 2015), thus becoming a real issue for the public health sector. Adverse reactions to foods may vary in clinical presentation, severity, and underlying etiology. Moreover, factors such as geographic variation; diet exposure effects; ingredients; and differences according to age, race, and ethnicity can contribute to the variation of the perceived symptoms (National Academies of Sciences, Engineering, and Medicine, 2017). Extensive data, in fact, suggest that bodily reactions can manifest themselves in the form of swelling, abdominal tension, discomfort, bloating, belching, altered bowel habits, and diarrhea (Ho, Wong, & Chang, 2014); symptoms that can be signal of the existence of malabsorption syndrome, food allergies, or food intolerance, but can also easily be attributed to functional gastrointestinal diseases, such as irritable bowel syndrome (IBS), or to their co-existence (Litleskare et al., 2015; Sherwin, 2018).

For these reasons, a unique and clear diagnosis can be difficult to obtain but is needed in order to define the most appropriate therapeutic strategy, which may include not only specific drugs, but also—and often mainly—lifestyle changes (healthy nutritional behavior and constant physical activity) (Pasqui, Poli, Colecchia, Marasco, & Festi, 2015). In this fragmented situation, a first distinction can be done in order to clarify some of the conditions included in the broader concept of adverse food reactions. At a broader level, it is possible indeed to differentiate between food intolerance and having a food allergy (Johansson et al., 2001; Sicherer & Sampson, 2018; Turnbull, Adams, & Gorard, 2015). A more comprehensive graphical representation of the different forms of adverse food

reactions is reported in the work of Turnbull and colleagues (2015), here put forth in Figure 1.3

Figure 1.3 Graphical representation of the different forms of Adverse Food Reactions - in Turnbull et al., 2015



Generally, a food allergy can be described in terms of a spectrum of clinic-pathological disorders or adverse immune responses that occur after exposure to a given food and are absent during its avoidance (Boyce et al., 2011; Sampson et al., 2014). The immune response could happen after a food (or a specific protein) has been ingested or inhaled, or through skin penetration (Moore, Stewart, & deShazo, 2017). Countless food allergies have been observed, but generally the most widespread allergies are to wheat, corn, peanuts, chocolate, eggs, shellfish, strawberries, tomatoes, milk, and soy products (Anvari, Miller, Yeh, & Davis, 2018; Sicherer & Sampson, 2018) (Table 1.1). These immune responses can be classified in relation with the role of immunoglobulin E (IgE): IgE-mediated, non-IgE-mediated,

or a mixture of both.

Table 1.1 Prevalence of food allergies in adults and children - in Turnbull et al., 2015

Food	Prevalence (%)
Young children	
Cow's milk	2.5
Egg	1.3
Peanut	0.8
Soy	0.4
Tree nut	0.2
Shellfish	0.1
Adults	
Shellfish	2
Peanut	0.6
Tree nut	0.5
Fish	0.4

“Food intolerance,” on the other hand, is a broader term used to describe all those adverse reactions related to the physiological response to a culprit food component but, contrary to food allergies, that do not involve the immune system since they occur almost entirely in the gastrointestinal tract (Berdanier, 2017; Turnbull, Adams, & Gorard, 2015). Despite the fact that they are reported more frequently in the population than food allergies, their different origins and symptomatology make them harder to detect. Nevertheless, across different data collection, methods, and definitions used, it is estimated that in the modern world, food intolerance affects up to 15 to 20% of the population (Lomer, 2015; Werfel et al., 2015). Food intolerance may occur in response to the pharmacological effects of food or food components, non-coeliac gluten sensitivity, or enzyme/transport defects such as lactose intolerance (Berdanier, 2017; Lomer, 2015). Symptoms are various, including gastrointestinal upset, migraines, fatigue, musculoskeletal problems, and behavioral changes; others can be more similar to food-allergy-related symptoms (respiratory difficulties, rhinitis, urticaria, and angioedema) but they don't appear immediately and have negative immunoglobulin E serology (Boyce et al., 2011). Moreover, often the generalized nature of these

symptoms cause people to have symptoms that overlap with those found in irritable bowel syndrome (Litleskare et al., 2015).

As for food allergies, in the diagnostic process it is important to consider the detailed medical history including a dietary and lifestyle assessment, with a focus on the potential for food intolerance. This assessment follows an investigation through specific tests, which may include blood and fecal tests and endoscopy and/or radiological imaging to exclude any organic disease (Lomer, 2015). Other possibilities for the diagnosis of food intolerance includes a breath test (De Lacy Costello, Ledochowski, & Ratcliffe, 2013), which detects the hydrogen and methane being produced in the digestive system mainly by the bacterial fermentation of carbohydrates (sugars, starches, and vegetable fibers) when they aren't absorbed, and the confocal laser endomicroscopy (CLE), a novel endoscopic imaging technique that facilitates the visualization of changes in the gastrointestinal mucosa, revealing a real-time response to food antigens (Fritscher-Ravens et al., 2014; Lomer, 2015). Along with these recognized tests, a variety of others are commercially available, however, their validity is not confirmed. Following in Table 1.2 is reported Lomer's summary (2015) of these texts with a relatively brief description. It is important to notice that the impact of these tests on a vulnerable target, like the ones affected by gastrointestinal symptoms, can be dangerous. The risk is that these people inappropriately over-restrict their diet, which can lead to poor nutritional diet and quality of life (Lillestøl et al., 2010; Lomer, 2015).

Table 1.2 Unvalidated tests with no scientific evidence to support their use in the diagnosis of food intolerance - in Lomer, 2015

Test	Description
Allergen-specific IgG or IgG4	Serological testing for IgG or IgG4 against several foods can be performed by enzyme-linked immunosorbent assays and radioallergosorbent assays. The presence of IgG or IgG4 against foods represents exposure to that particular food and indicates immunological tolerance. ⁹² Therefore, increases in IgG or IgG4 concentration against food or food components are common and clinically irrelevant. However, these commercially available tests are widely available and may lead to inappropriate dietary over-restriction.
Cytotoxic assays	Cytotoxic food testing involves the addition of whole blood to a food extract and is based on the assumption that leucocytes reacting to food antigen exposure can predict intolerance to food. However, the test is not reproducible and positive cytotoxic effects are frequently obtained with foods that produce no clinical symptoms while negative results are obtained with foods that do produce clinical symptoms. ^{93, 94}
Electrodermal test	A galvanometer is used to measure skin conductivity. The patient holds a negative electrode in one hand and a positive electrode is placed on specific acupressure points. Food extracts in sealed glass vials are put in contact with an aluminium plate within the circuit. Food intolerance is diagnosed when there is a drop in electrical conductivity of the skin. No studies have demonstrated its usefulness to detect food intolerance. ⁹⁴
Hair analysis	Bio-resonance analysis of hair based on the belief that anything living emits electromagnetic waves that can be measured as good or bad. However, there is no explanation of how hair analysis might detect food intolerance. ⁹⁵
Iridology	Iridology involves the analysis of the iris assuming that all organs are represented in the iris and any irregularities in pigmentation represent dysfunction. There is no scientific evidence to support the use of iridology in the diagnosis of food intolerance. ⁹⁶
Kinesiology	The patient holds a sealed glass bottle that contains a test food or food extract while an investigator estimates muscle strength in the other arm. A decrease in muscle power while the food is held is considered to indicate food intolerance. Another method of kinesiology called DRIA measures a change in muscle strength in response to a food extract being placed under the tongue. ⁹³ These tests have no scientific support and have not been validated.
Pulse test	This may be used in combination with provocation-neutralisation or independently. A 16 beats per min change in the pulse rate from baseline indicates food intolerance following sublingual or intradermal exposure to the specific food extract. There is no clinical evidence to support the use of this test. ⁹⁴
Sublingual or intradermal provocation-neutralisation	Aqueous food extract is placed under the tongue or intradermally and observed for symptoms to occur (usually 10 min). If symptoms occur, a neutralising dose (diluted dose of the same food extract) is given in the same way. Symptoms are expected to disappear in about the same time period. Adverse outcomes are rare but these tests have failed to show any usefulness in food intolerance. ⁹⁴

As for food allergies, the management of intolerance includes the exclusion of culprit foods to verify the symptoms disappearing, followed by a subsequent re-introduction to induce a reaction and verify the intolerance (Chey & Whelan, 2016; Lomer, 2015). However, contrary to what happens with an allergy, in the case of intolerance, it is possible to re-introduce again the food in a reduced quantity, instead of excluding it completely from the diet. One of the most successful exclusion diets is the so called low-FODMAP (Gibson, 2017) since it has been shown that a FODMAPs (fermentable, oligosaccharides, disaccharides, monosaccharides and polyols) diet, which restricts a wide variety of foods from different food groups (cereals, fruits and vegetables, milk and milk products) that are poorly absorbed in the small intestine and fermented by bacteria in the colon, can trigger symptoms such as bloating, abdominal pain, altered bowel habits

(diarrhea and/or constipation), and gas in sensitive individuals (Marsh, Eslick, & Eslick, 2016; Staudacher & Whelan, 2017). After three to four weeks of avoidance, the food can be introduced following the expert guide of a professional. However, currently there is no long-term safety data about the efficacy of the application of this diet (Lomer, 2015; Nanayakkara, Skidmore, O'Brien, Wilkinson, & Geary, 2016; Pedersen et al., 2017).

Among the other forms of food intolerances, gluten and lactose sensitivity are the most prominent in relation to their clinical relevance and the consequent consumers' choices.

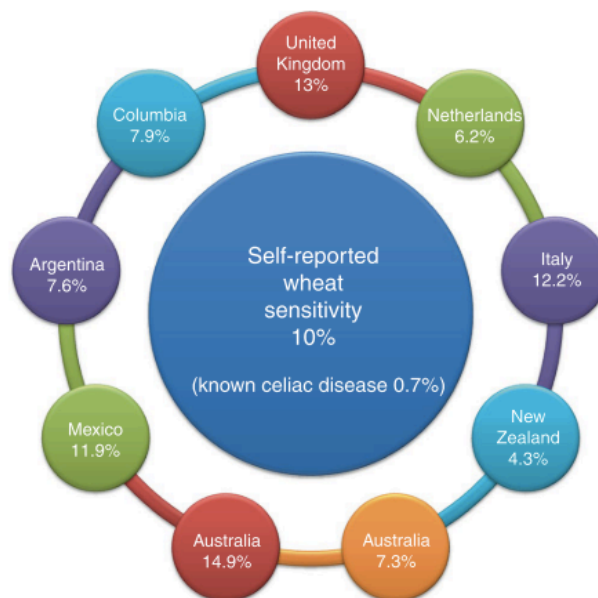
Gluten Sensitivity: Facts and Myths

Wheat is the most widely grown crop worldwide because it can be cultivated in different climates and offers a high nutritional value with good organoleptic characteristics (Catassi et al., 2013; Rathi & Zanwar, 2016). Gluten is the main structural complex protein of wheat and it represents the complex of water-insoluble proteins contained in it, rye, and barley (Lichtenstein, 2018). For its versatility and properties, it is widely processed in many foods, including breads, pasta, pizza, bulgur, and couscous; drinks, such as beer; and some cosmetics. However, the same characteristics that make gluten so unique and desirable for human consumption also lead to disease, whether involving the immune system (wheat allergy and celiac disease) or not (gluten sensitivity) (Anderson et al., 2007; Sapone et al., 2012; Tatham & Shewry, 2008).

In particular, the most controversial and highly debated discussion is about gluten sensitivity, because for this condition the diagnosis appears more challenging. Recent studies have proved, indeed, that after passing a rigorous double-blind placebo-controlled crossover controlled trial, only gluten-per-se

accounts for one in six gluten sensitivity cases (Molina-Infante & Carroccio, 2017), with the remaining majority due to other or nocebo effect (Catassi et al., 2013). To give an overview of the this phenomenon, the author here proposes an editorial published in 2018 in the *American Journal of Gastroenterology* (Aziz, 2018) that collected data from several articles assessing the rate of self-diagnosed wheat sensitivity (Figure 1.4).

Figure 1.4 The general population prevalence of self-reported wheat sensitivity - in Aziz, 2018



The overlapping effect with other conditions and the increase in self-reports of having a gluten free diet lead to the misperception of a global phenomenon (Rathi & Zanwar, 2016), raising some perplexities about the effective healthiness of this diet. A gluten-free diet, in fact, may have unintended consequences because of the related nutritional restrictions. Despite numerous health claims and the exploding popularity of these products, indeed, data to support the health benefits of a gluten free diet are still controversial (Reilly, 2016). Some research has focused on the role of a gluten-free diet on weight loss (Kim et al., 2017;

Marcason, 2011). In particular, the results of several studies of patients with celiac disease suggest that a gluten-free diet may actually worsen Body Mass Index (BMI) status in some overweight and obese individuals. Gluten-free baked goods can be high in fat and total energy, along with a high content of saturated lipids (Melini & Melini, 2019). Moreover, gluten-free diets register remarkable inadequacies in terms of both macro- and micronutrients, leading to low levels of fibers, folate, vitamin B12, vitamin D, calcium, iron, zinc, and magnesium (Raehsler, Choung, Marietta, & Murray, 2018; Wünsche et al., 2018) or, worse, to chronic diseases such as heart disease (Kim et al., 2017) or type 2 diabetes mellitus (El-Chammas & Danner, 2011; Green, 2009). These results highlight some potential risks in following a gluten-restricted diet. It is important in particular to notice that a gluten-free diet can be a well-balanced diet if care is taken in including other ingredients to balance the loss of nutrients, such as eating more legumes and selecting foods with a lower energy density (Gaesser & Angadi, 2012). A restrictive diet indicates that one should obtain regular health checkups in order to sustain a balanced regimen. Finally, along with nutritional deficiencies, scholars have found other socio-economical impairments to following a gluten-free diet for people with celiac disease (Arias-Gastelum et al., 2018). These elements may not be taken into consideration in the first place for consumers who deliberately avoid this ingredient, but they can have collateral effects on their lifestyle in general in the long term.

Lactose Intolerance: Facts and Myths

Historically, dairy products were the predominant source of energy in particular for European and American individuals, but today the declining intake of cow's milk and other products is raising numerous challenges. In addition, scholars have shown that the mechanisms of lactose tolerance and digestion holds an important role also on the understanding of people's broader lifestyle and cultural

characteristics (Ségurel & Bon, 2017; Silanikove, Leitner, & Merin, 2015). For these reasons, the increasing trend in having a dairy-free diet is raising concrete concerns (Misselwitz, Butter, Verbeke, & Fox, 2019). Lactose is the main source of carbohydrates in human milk and in the milk of most of all of the others mammals (Sharif, Khan, Qamar, Naveed, & Ghauri, 2017). Several products contain lactose and so do several prepared foods, such as, for example, gravy or sauce mixes, vegetable or chip dips, soups, as well as chips or snack crackers. Here is a list of foods specifying the content per grams proposed by (Misselwitz et al., 2019) (Table 1.3).

Table 1.3 Lactose content in dairy products and foods (representative values are provided) - in Misselwitz et al., 2019

Food	Lactose content (g) per 100 g	Lactose content per typical serving (g)
Milk (full)	4.7	15
Milk (skimmed)	4.8	15
Lactose-free milk	<0.1	<0.1
Goat's milk	4.5	13
Buttermilk	3.0	9.0
Butter	0.5	0.1
Yoghurt (fresh)	3.0	9.3
Yoghurt (biological)	4.0	9.5
Cream cheese	3.0	0.9
Soft cheese (eg, camembert)	0.3	0.1
Hard cheese (eg, cheddar and gruyere)	0.1	<0.1
Cream	3.6	3.2
Soft ice cream	6.4	5.7
Latte Macchiato	4.3	8.6
Lasagne	1.1	2.6
Cheeseburger	0.9	1.1
Ready sauces	3.6	4.5
Pudding/custard	3.6	4.5
Rice, nut, soy or oat beverages	0.0	0.0

Meat and alternatives contain very little lactose. Products that may include lactose are those prepared with milk or milk products such as some processed meat, sausage, breaded or battered meat or fish, commercial egg substitutes, scrambled eggs, soufflés.

Fats and oils contain very little lactose. Products that may include lactose are those prepared with milk or milk products such as butter or margarine made with milk or whey powder and salad dressings (eg, ranch style or buttermilk).

Prepared foods may include lactose when made with milk or milk products. These include store bought gravy or sauce mixes, vegetable or chip dips, soups, chips or snack crackers (eg, cheese flavoured), artificial whipped toppings, powdered meal replacement supplements and cream-based liqueurs.

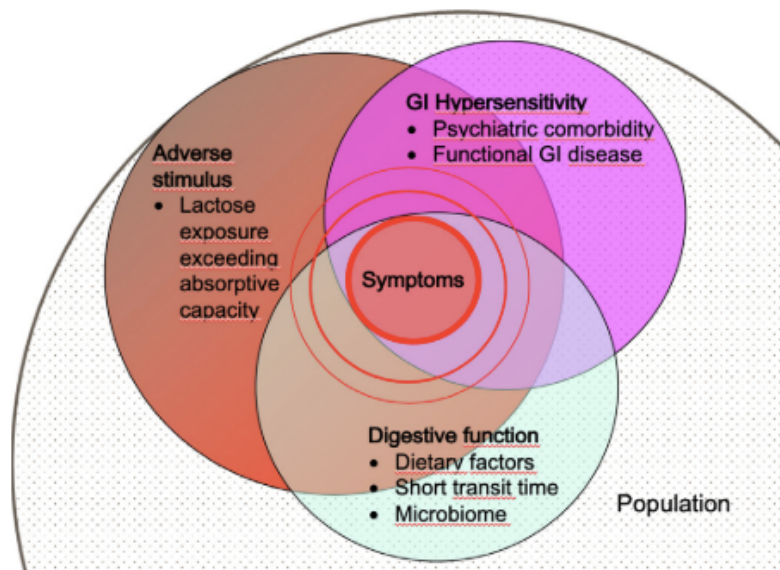
Within the animal world, nonhuman mammals usually lose their ability to digest lactose as they reach adulthood. In human beings, it is possible to refer to different terms to describe the processes related to the general functional or non-functional lactose metabolism, which often leads to confusion in the determination of consequent conditions. (Misselwitz et al., 2019) proposed a glossary with the main terms relating to adverse reactions to lactose ingestion (Table 1.4).

Table 1.4 Glossary with definitions related to lactase deficiency, lactose malabsorption and lactose intolerance - in Misselwitz et al., 2019

Concept		Definition
Congenital lactase deficiency	CLD	Very rare genetic disorder (typically frameshift mutations) leading to lack of expression of lactase and severe symptoms immediately after birth
Lactase non-persistence	LNP	Decrease of intestinal lactase expression in the first two decades of life. Phenotype in most individuals worldwide (biological wildtype)
Lactase persistence	LP	Continued expression of intestinal lactase expression beyond infancy; dominant phenotype in Western countries.
Lactase deficiency	LD	Inability to digest large amounts of lactose due to low lactase expression in the small intestine
Lactose malabsorption	LM	Passage of lactose into the large intestine as a consequence of LD or other pathology (eg, rapid transit)
Primary lactose malabsorption		Lactose malabsorption due to lactase non-persistence (dominant phenotype worldwide).
Secondary lactose malabsorption		Lactose malabsorption due to lower lactase expression, typically in the setting of intestinal inflammation (may be reversible).
Lactose intolerance	LI	Appearance of typical intestinal symptoms such as abdominal pain, bloating, diarrhoea in individuals with LM after lactose ingestion determined by appropriate testing (ideally blinded testing).
Functional lactose intolerance		Symptoms of LI on lactose challenge in individuals without lactose malabsorption.
Self-reported lactose intolerance	SLI	History of LI symptoms without formal testing of either LM or LI.

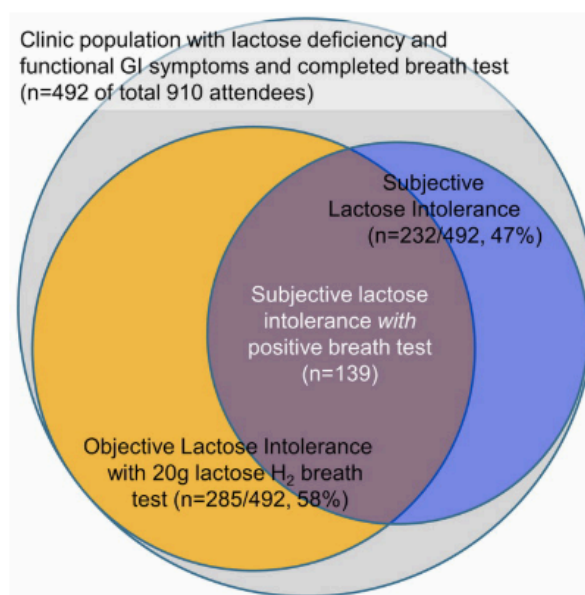
Lactose intolerance is a syndrome having different intestinal or extra-intestinal symptoms after the consumption of foods containing lactose. This derives from an insufficient level of lactase activity in the brush border of the small bowel mucosa (Di Costanzo & Canani, 2018). People mostly naively refer to this umbrella term to express the adverse conditions related to lactose ingestion, because this condition determines the perceived symptoms (Deng, Misselwitz, Dai, & Fox, 2015). The likelihood of developing symptoms after lactose ingestion is indeed multifactorial. Misselwitz and colleagues (2019) described this complexity in the figure here (Figure 1.5).

Figure 1.5 Multifactorial likelihood of developing lactose ingestion symptoms - in Misselwitz et al., 2019



For these reasons, problems with lactose absorption have been described, detected, and diagnosed in several ways, and this can lead to confusion among individuals and health professionals (Deng et al., 2015; Shaukat et al., 2010). Recent studies have provided important new insights into the complex relationship among lactase deficiency, lactose malabsorption, and symptom generation (Misselwitz et al., 2019). Because lactose malabsorption can be mostly be attributed to lactase deficiency, the presence of this condition can be inferred from measurements of lactose malabsorption, such as an increase of glucose in the blood or an increase of hydrogen in the breath (Deng et al., 2015) . Lactose intolerance, instead, is characterized by the presence of different clinical presentations, which make it more considerable disabling from the individuals. However, it is not possible to make a definitive diagnosis based upon clinical presentation alone. (Zheng et al., 2015) have indeed demonstrated that the association of self-reported lactose intolerance and the occurrence of symptoms after lactose ingestion is very poor, even for patients with a lactase deficiency (Figure 1.6).

Figure 1.6 Lack of agreement between objective and subjective assessment of lactose intolerance - in Zheng et al., 2015



As for gluten-related adverse reactions, a limited diet is the only treatment for people suffering from lactose intolerance. The complete avoidance of lactose allows the gut to heal and resolves nutritional deficiencies and other associated symptoms. However, while avoiding lactose and following a lactose-free diet may seem simple, as happens for the gluten-restricted diet, a lactose-free diet can lead to nutritional consequences that need to be considered as part of a broader understanding of this phenomenon. In particular, since most of the dairy products available in the market contain lactose, the avoidance of such products could lead to a complete change in lifestyle that may not be practicable for everyone. Nutritional deficiencies can be assessed in people with a lactose-free diet, since a perceived lactose intolerance may lead to reduced bone density and fragility fractures when accompanied by a decreased intake or avoidance of dairy (Hodges, Cao, Cladis, & Weaver, 2019). Moreover, dairy products are valuable sources of protein and vitamin D (Rozenberg et al., 2016; Wahlqvist, 2015). Moreover, along with nutritional deficiencies, other aspects related to the broader quality of life can be affected by a restrictive diet (Böhn, Störsrud, Törnblom,

Bengtsson, & Simrén, 2013; Zheng et al., 2015). Some of these aspects are related to the development of a sense of social isolation (Suri et al., 2019) due to the difficulty to adopt the diet in the broader context of social reference and the perceived pressure by the others. Moreover, the choice of this diet can be also stressful for people who have to manage different challenges from changes in food shopping to new cooking habits. Finally, as per the available literature, adherence to a lactose-free diet leads to an economic burden on the patients because lactose-free products available in the market have prices much higher when compared to lactose-containing products (Thiele, 2013).

To conclude, food intolerances are a set of complex diseases at the biological level and, although much research data have been accumulated, many fundamental questions still remain with no answers. It is necessary to find a sustainable way to face this pandemic phenomenon, which is made even more urgent by consumers' over-evaluation of "free from" diets as healthier and considering the potential nutritional deficiencies of this restrictive diet. From a medical perspective, multiple hypotheses have been generated about the potential genetic and environmental factors that lead to food allergies and intolerances. However, gaps in knowledge at the mechanistic level as well as individual's own misdiagnoses represent barriers to developing effective strategies for disease prevention and management. Not surprisingly then, recommendations by public health authorities or professional associations for the prevention or management of this phenomenon are limited by the scarce, inconsistent, or contradictory research findings.

In 2017, the National Academies of Sciences, Engineering, and Medicine proposed a consensus report to assess the global burden of food allergies, setting the agenda for future research and intervention activities. Three aspects in particular emerged as major issues for the public health agenda: to reach a

proper and accurate estimate of the phenomenon, to identify scientific and evidence-based methods to diagnose the diverse food adverse reactions, and to find effective interventions for the prevention and/or treatment for these reactions. In other words, the challenge for the health sector is indeed to find ways to target the issue so as to reduce problems related to self-diagnosis and autonomous treatments. As happens for other chronic conditions, food-related pathologies result in numerous organizational, economic, and social burdens. The economic impact of food allergies may be widespread, affecting many sectors of society both directly and indirectly (Miles et al., 2005). From a recent systematic review, it emerged that out-of-pocket costs, including the costs of special diets, are an important component of the economic burden for consumers, as found in several studies worldwide (Bilaver, Chadha, Doshi, O'Dwyer, & Gupta, 2019). But the individual burden is not the only one. The health care system's perspective reflects also on other costs incurred by the health care system for the treatment of these particular diseases. In 2012, McBride and colleagues conducted an economic study within a European Commission framework integrated project, EuroPrevall, which aimed to assess the prevalence, cost, and basis of food allergies in Europe. They in fact demonstrated that food allergies can have a significant impact on health care costs in countries across Europe by providing evidence that the cost of health care is significantly higher for children and adults with food allergies than for those with no food allergies. They also showed that there is a positive relationship between the severity of the symptoms of food allergies and the costs of providing health care. Given these preliminary results, it is clear that the misdiagnosis and perception of food intolerance may contribute to the increasing economic burden on the broader healthcare system as well as the required resources to manage it. All these components, from diagnosis to treatment, are indeed to be considered in order to help the public health sector deal with this problem.

2.3 Industries Challenges for Food Innovation and Safety

According to Euromonitor International (2017), in the last few years, the “free from” market has achieved remarkable results. The gluten-free sector has recorded a revenue of 320 million euros and an increase of 27%. In addition, the lactose-free sector has recorded a turnover of 393 million euro and an increase of 18%. The potential of this market are now more than ever evident and many industries are surfing this wave in order to innovate their offerings and to gain an economic advantage in the market. Along with these positive results, however, it is possible to identify for these companies some of the challenges related to the development of this market. In particular, despite “free from” products being on the list of the most important changes in food and nutritional science development in the last half century (Munday & Bagley, 2017), there are several points to consider about these foods’ production. Apart from consumers’ acceptability (in terms of taste, for example), which is taken for granted here in discussing people’s voluntary turn to the “free from” diet, other challenges faced by the developers of these foods are related to safety of the products, the maintenance of nutritional values, the meeting of legal requirements of industry guarantors such as Food and Drug Administration (FDA), and relative labeling constraints (Suri et al., 2019). With the exception of “gluten free,” which is mostly regulated as a food allergy, there is no specific European legislation covering “free from” claims. “Free from” claims are regulated in accordance with the provisions of the General Food Law to make sure that food is safe for consumption as well as the regulations on food information to make sure product information is not misleading and is accurately communicated (The Food Standards Agency, 2017). A “free from” claim stating the absence of a specific food allergen in any food, including prepackaged and non-prepackaged food (e.g., food sold loose or as a menu item), must be relevant and based on a comprehensive risk assessment accompanied by rigorous controls (which may

include analytical testing) to ensure that the claim is valid (EU Food Information for Consumers Regulation - EU FIC, 2017).

3. Consumer Psychology: Setting the Research Agenda to Face Food Intolerances in the Italian Context

To briefly sum up and bring together what has been discussed above, the last 10 years has seen a drastic societal change with regard to the public awareness of adverse food reactions, in particular those related to gluten and lactose, thus contributing to an increase in the rate of “free from” diets within the world population. While choosing to adopt this lifestyle can alleviate a myriad of physical symptoms for people with special medically diagnosed conditions, the over-estimation of food intolerances and the spread of misdiagnoses highlight numerous criticisms around this phenomenon. As the author has discussed above, several include the constraints related to both nutritional adequacy of these diets and economic challenges for consumers. However, these structural constraints related to gluten- and lactose-free diets seem not to discourage people from undertaking this choice, thus suggesting that the motivations are strongly rooted in something deeper. In this direction, the psychological and symbolic interpretation of these foods may be a key to understanding consumer conduct. In the scientific literature, indeed, scholars have shown that these restrictive diets have counterproductive effects on the psychological wellbeing of individuals, including depression, stress, and a lower quality of life (Knibb, 2018). A relatively recent field of study, starting with the contribution of Bratman (2001), described this new form of eating pathology, Orthorexia Nervosa, which is expressed by an obsession with healthy food consumption (Dunn & Bratman, 2016). Orthorexia nervosa, literally meaning “proper appetite”, is a pathological fixation with healthy food that has aptly been described as “a disease disguised as a virtue” (Bratman & Knight, 2000). Although not yet officially recognized as a psychiatric diagnosis,

orthorexia is often associated with significant impairment, as what starts as an attempt to attain optimum health through attention to diet may lead to malnourishment, loss of relationships, and poor quality of life (Brytek-Matera et al., 2015; Gleaves, Graham, & Ambwani, 2013). Bratman, in particular, describes this phenomenon as composed of two steps, the first of which can be simply described as an innocent choice of healthy diet, mostly in the presence of non-standard dietary ideas that appear irrational, unscientific, or strange (Bratman, 2017).

However, no particular attention has been given to the hidden motivations behind this choice and what these diets mean to consumers. Moreover, in a context like Italy, the increasing development of the “free from” market above its real medical necessity is bringing about profound changes in economic assets. Between 2017 and 2018 in Europe, the estimated per capita consumption of milk has decreased by 0.35% (CLAL, 2019), a phenomenon that in Italy has taken on an even greater dimension, and the same results are found for the consumption of pasta and bread, which have registered a decrease, respectively, of 1.9% and 3% in the last few years (Nielsen, 2017-2019). These trends are consequently and profoundly changing not only the economic assets of a country like Italy, but others as well, given that the consumption of milk, bread, and pasta are a part of the cultural and traditional diet.

Having these premises in mind, the aim of this dissertation is to explore the psychological determinants of gluten- and lactose-free diets among Italian consumers, with a particular focus on tolerant consumers.

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CHAPTER TWO

CONCEPTUALIZING “FREE-FROM” FOOD CONSUMPTION: A SYSTEMATIC INTEGRATIVE LITERATURE REVIEW FOCUSED ON GLUTEN AND LACTOSE

Abstract

Gluten- and lactose-free products are registering a sudden rise in the market due to the increasing spread of adverse food reactions and related health issues. At the same time, the actors within the food system demonstrate increasing interest in these products. Industries, institutions, and policy makers are investing in these special food categories as a possible solution to some of the global challenges related to the environmental detriment, the need for a healthier diet, and social and economical restrictions. In this scenario, however, more and more people are including these special foods in their diets, even if the elimination of these ingredients by the ones who can tolerate them, and consequently the consumption of alternative products, has been proved to cause several medical and nutritional issues.

Scholars from different disciplines have focused on the study of this phenomenon, but the scientific debate appears fragmented and lacks a broader view on consumers' behaviours. In particular, consumers' determinants of gluten-free and lactose-free consumption appear unclear. For these reasons, after having contextualized new trends in “free from” food diffusion in chapter 1, the author will propose a Systematic Integrative Review aimed at organizing the scientific debate around these foods, mapping consumption determinants and proposing a new integrated conceptualization for the understanding of people's behaviours in consumption of these foods. In the proposed model, moreover, differences and similarities between tolerant and intolerant consumers will be highlighted.

The results of this study will be useful to create a first overview of the phenomenon under investigation and to identify research gaps and opportunity for further research.

1. Introduction

As discussed in the previous chapter, in an increasingly complex and challenging scenario, individuals are dramatically concerned about the foods they buy and consume, specifically foods that could prevent health problems before they arise (Sicherer & Sampson, 2018). Moreover, the spread of food adverse reactions (such as intolerances to gluten and lactose) has motivated more and more people to rediscover unprocessed food as medicine, which refers to food as a way to prevent health problems (Martirosyan & Singh, 2015).

According to the latest trends, the number of adults who adhere to some type of special diet – to avoid allergens, such as lactose or gluten – has increased considerably in the last years (Capannolo et al., 2015; Dekker, Koenders, & Bruins, 2019; Schierhorn, 2018), as reported in the first chapter. The presumed health benefits that these diets can bring have extended this trend into a worldwide phenomenon with ever-increasing numbers of followers.

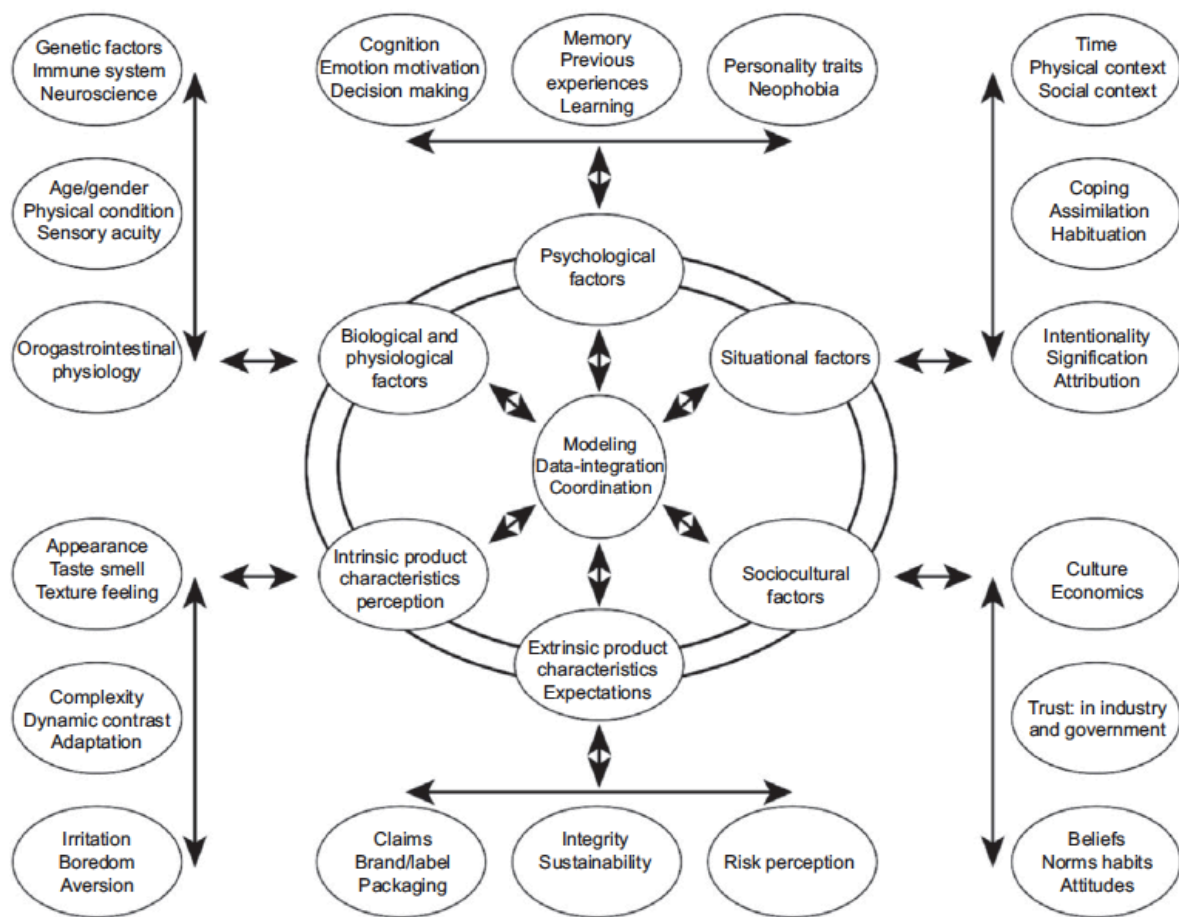
In most cases, people decide to avoid a certain ingredient not on the basis of medical advice but because they feel better without eating it, or they believe it to be hard to digest, as is the case with gluten and lactose (Aziz, 2018; Di Costanzo & Berni Canani, 2019). However, evidence shown in the previous chapter highlighted that adoption of this diet brings some limitations on different levels, from nutritional to economical (Thiele, 2013).

As this phenomenon appears to be potentially interesting for marketers and health policy makers, there is still a need to understand some related controversial aspects and to orient future actions.

In the face of recent and growing interest among consumers in these products, scholars have attempted to decipher this food trend (Asioli et al., 2017; Christoph, Larson, Hootman, Miller, & Neumark-Sztainer, 2018; Dekker et al., 2019). However, to date, the scientific debate appears fragmented and lacks a systematic vision. In fact, the study of this phenomenon appears challenging

because of the complexity of the food choice behaviours involved. In this direction Koster and Mojet (2018) recently suggested a more interdisciplinary perspective to address consumers' behaviours regarding food choice, in an attempt to give reason to the different variables involved. They proposed a six-factor model (Figure 2.1).

Figure 2.1 Theoretical framework of consumers' behavior in food choices – in Koster & Mojet, 2018



In particular, this model addresses the following areas: *psychological factors*, such as cognitive processes, decision making, and personality traits; *situational factors*, such as habits and social signification processes of the context;

sociocultural factors, like culture, beliefs, and norms; *extrinsic product characteristics*, such as brand, labels, and packaging; *intrinsic product characteristics*, such as texture, smell, and contrast adaptation; and finally, *biological factors*, such as variables related to the consumers' demographics and immune system functioning. This model is here used as theoretical framework as it could properly represent the complexity of consumers' choice in food consumption as intended in this dissertation.

Finally, this work will apply an ecological perspective (Stokols, 1992) in an attempt to make a step forward in the conceptualization of this phenomenon. The ecological perspective is well known in the study of health theories and can be applied to complex and the multi-layered phenomena that imply different levels of variables (Golden & Earp, 2012), including individual, relational, cultural, and societal levels. In this study, the author used this approach in an attempt to further the conceptualization of the consumers' behaviours understanding by integrating the 6 areas described above (Köster & Mojet, 2018) into three different levels: *micro* (including all variables related to the individual), *meso* (expressing variables at relational and proximal levels), and *macro* (variables related to the broader environmental and cultural framework), inspired by the original work of Bronfenbrenner (1979).

With these premises in mind, the author will propose a new and integrated conceptualization of consumers' behaviours in consumption of these foods. Moreover, as one of the challenges as previously highlighted is related to the consumption of these products from both tolerant and intolerant consumers, the author will compare the consumption determinants of these two targets to discuss the results, thus proposing new research opportunities.

To sum up, in this chapter the author will critically and deeply discuss the extant literature to provide a conceptual model to understand the consumption behaviours of gluten-free and lactose-free food consumption between tolerant and intolerant people.

In particular, the objectives of this study can be detailed as follows:

- to provide a first overview of the scientific debate around gluten- and lactose-free products;
- to map the main determinants in terms of facilitators and barriers of the consumption, both from tolerant and intolerant consumers;
- to organize this knowledge into an integrated conceptual model;
- to highlight research gaps for future studies.

2. Methods

2.1 Design

The author reviewed the existing literature following the guidelines for systematic and integrative review, which address new or emerging topics that could benefit from a holistic conceptualization and synthesis of the literature to date (Ramdhani, Ramdhani, & Amin, 2014; Torraco, 2005). Because the topic of gluten- and lactose-free food consumption is relatively new, few scholars have yet undergone a comprehensive review of the literature. This work aims to provide a new conceptualization of the topic investigated, starting from the conceptual areas of consumers' behaviour comprehension as proposed by (Köster & Mojet, 2018) from an ecological perspective (Bronfenbrenner, 1979). In doing so, the author undertakes a tandem strategy of critical quantitative analysis and qualitative synthesis, in which data (literature) is used to generate new knowledge to understand consumer behaviour and to create a new perspective on the topic as a whole. In particular, a two-step analysis was implemented: first, within the quantitative phase, the author obtained a first measure of the scientific debate around the concepts of gluten-free and lactose-free consumption, applied to a first pull of selected studies (Section 3.1). The second phase proposed a qualitative synthesis of a more restricted and pertinent number of articles in order

to map of the main determinants of these foods consumption (for each of tolerant and intolerant people), converging into a new conceptual model (Section 3.2).

2.2 Search strategy

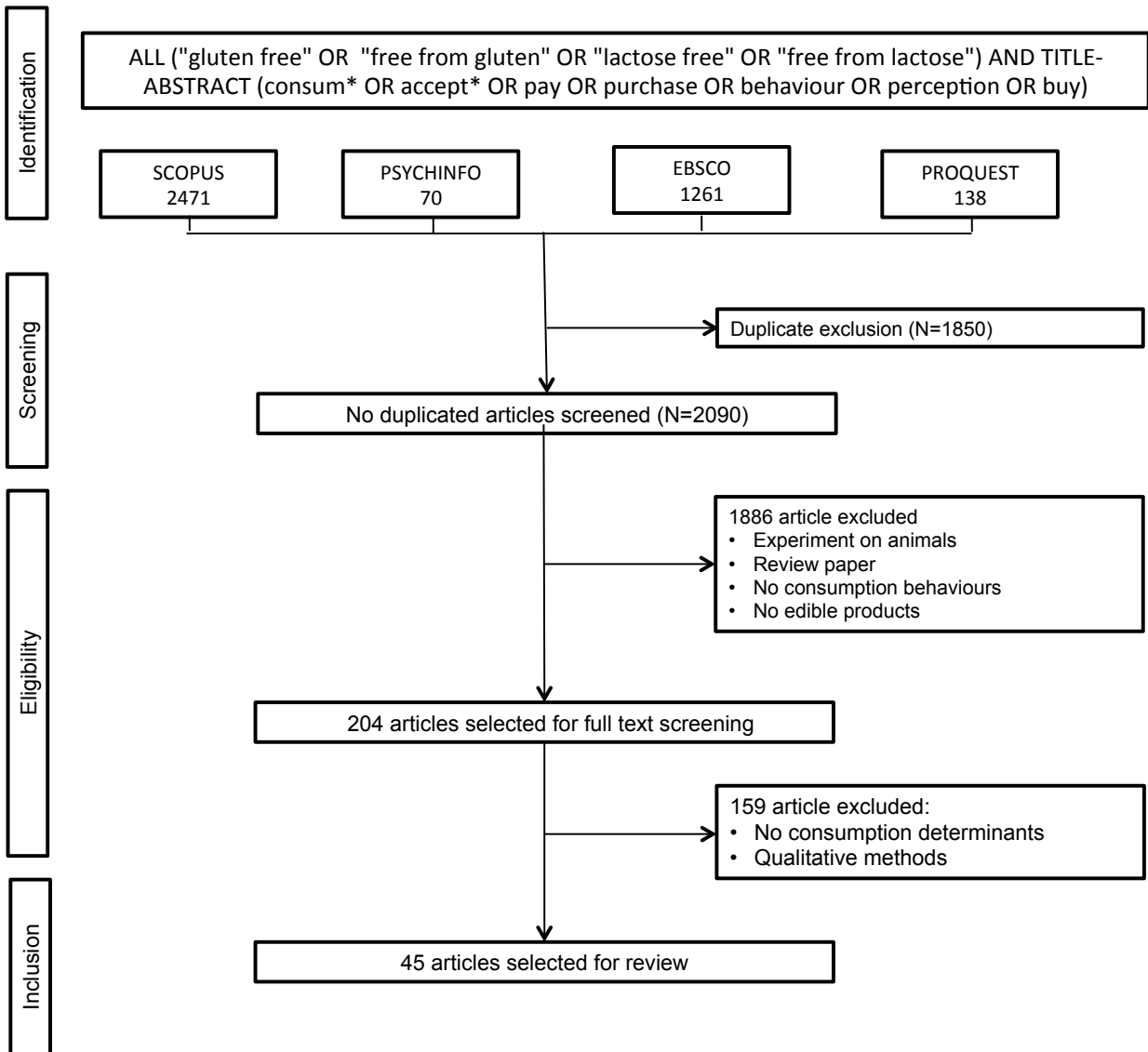
To be included in the review, papers needed to focus on the broad phenomenon of lactose- and gluten-free food consumption. In particular, the following string was developed: ALL TEXT ("gluten free" OR "free-from gluten" OR "lactose free" OR "free-from lactose") AND TITLE and/or ABSTRACT (consum* OR accept* OR pay OR purchase OR behaviour OR perception OR buy) in order to cover the main terms and synonyms used to express the phenomenon under investigation. In particular, the food categories' synonym enabled the reader to catch the point about the food ingredient, meanwhile the words used to describe consumer behaviours were decided to be inclusive of different facets of the phenomenon, but not so broad as to lose the research focus. Four main scientific databases were scanned: SCOPUS, PROQUEST, PSYCHINFO, and EBSCO. Moreover, considering the relative newness of the concept, no time restriction was applied. Multiple rounds of screening were undertaken to derive the final set of studies for the review.

2.3 Selection criteria

After the string launch, a first selection step was applied through the refined tool of the search platforms in order to select English language papers, to focus on the international debate and to understand adequately the contents, and peer-reviewed papers, in order to consider the works evaluated from the scientific community. Through this process, a total of 3940 articles were retrieved among the different databases. A first screening round was applied in order to remove duplicates, producing a total of 2.090 articles. A further round of screening was applied to the abstracts with the following eligibility criteria: no experimentation on

animals; only articles studying edible products (because the aim was to evaluate the variables of food consumption); no consumption behaviours were discarded, because the author wanted to focus explicitly on their determinants; and no reviews, which were instead used to discuss the final results. Finally, a total of 204 articles were included, on which the author undertook a first quantitative analysis. Moreover, due to the focused scope of this review, a further final screening round was implemented to the full text to exclude articles not in line with the study's objectives. To sum up, we selected only the studies useful to frame the consumption of gluten-/lactose-free products and to detect the determinants of this process, both from tolerant and intolerant consumers. Only quantitative studies (cross-sectional and experimental designs) were selected in order to consider the impact of the determinants on the consumption. A final corpus of 45 articles was subjected for the detailed qualitative synthesis to arrive at the conceptual model. The entire selection process is represented in the flow diagram (Figure 2.2).

Figure 2.2 PRISMA systematic review flow diagram



2.4 Analysis process

In line with the aim of the systematic integrative review process, a two-step analysis is proposed here (Torraco, 2005). A first quantitative critical analysis was implemented to profile a first pull of selected studies (N=204); research areas, time trends (Figure 2.3); geographical distribution (Figure 2.4), and studies' methodologies were thus mapped. This phase allowed the author to identify the major trends of publications and to have a first overview of the scientific debate around the phenomenon under investigation, pointing out research gaps and future indications.

Secondly, a phase of qualitative synthesis was conducted on a restricted pull of more focused articles (N=45), with the aim of mapping the variables concurring with consumers' behaviours and determining the similarities and differences between tolerant and intolerant subjects. In doing so, first the author mapped the target of the studies, dividing the articles addressed to tolerant and intolerant consumers. Then, the author mapped in detail the variables with a positive role in consumption (facilitators, graphically represented with a + symbol) and the variables hindering consumption (barriers, graphically represented by - symbol), described by the authors in their original works. Finally, the author grouped and allocated these key variables into a new and integrated conceptual model, highlighting similarities and differences between the two targets (Figure 2.5). The articles' details are moreover summarized in Table 2.1.

3. Results

3.1 Quantitative critical analysis

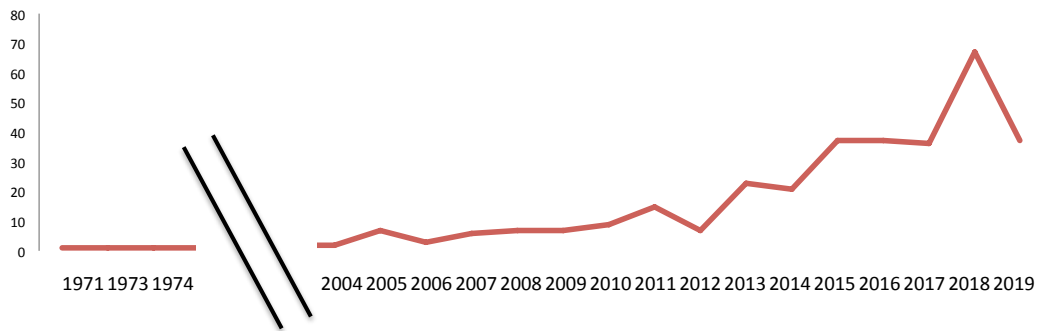
Articles retrieved for the first analytical step ranged from 1971 to June 2019, when the string was launched. A first general quantitative critical analysis was undertaken. In particular, among the articles selected (N=204), nearly half (N=105)

relate to medical areas (related to the gastroenterology, digestive system, allergies, ...), human nutrition, and public health issues. A second group of articles (N=60) is about agriculture, food sciences, and technologies applied to food and biological processes. Another minor group of studies focused on the area of agro-economy considering studies related to the market and the selling of these products (N=9). The rest was focused on miscellaneous areas (N=30).

This first overview highlights as the majority of the literature focuses on the technical aspects related to the food development and analysis, or to health and nutrition, but relatively low attention has been given to the consumer behaviours to buy these products. The disciplines involved refer to medicine and nutrition, agriculture and food science, economy and law; little research has been done by social and psychological disciplines. Moreover, before the last focused screening phases, it was possible to map the studies' methodology in order to understand the research trends in this field. In particular, among the 204 publications retrieved, only 19 reported a qualitative methodology, exclusively or in combination with a quantitative phase. Two main areas of investigation can be identified: one is related to consumers' perceptions of labels, information, and beliefs about "free from" foods (De Morais Sato et al., 2019; Bazhan et al., 2017; Nolan-Clark et al., 2011), while the other refers to life-related aspects and consequences of the adherence to an alternative diet, such as a "free-from" diet (Bege, 2017; Golley Corsini and Mohr, 201; Hallert, Sandlund and Broqvist, 2003).

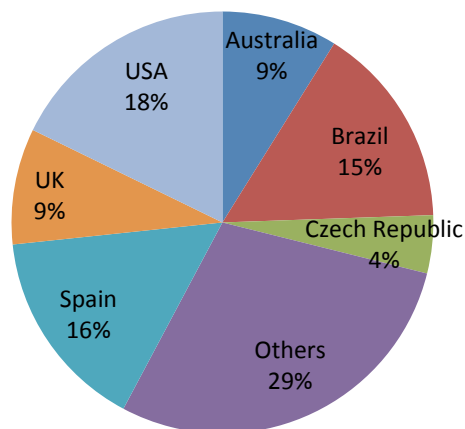
Considering the time development of the research about gluten- and lactose-free consumption focusing on consumer behaviour and decision making, it is possible to affirm that the amount of publications has remained more or less stable from 1971 to the early 2000s, with a rearing of publication in recent years, from 2013 (Figure 2.3).

Figure 2.3 Publications' time distribution



The geographical distribution reflects a general and diffused interest in this topic, with some points of particular attention in America (18%) and particularly South America (Brazil, 15%), Europe, with an increase in Spain (16%) and in Others 29% (among the others: Poland, Hungary, Romania, Italy, and Finland).

Figure 2.4 Publications' geographical distribution



3.2 Qualitative synthesis and conceptualization

The final pull of articles (N=45) was then subjected to qualitative synthesis to collect the determinants of consumers' behaviour of free-from-gluten and -lactose consumption and to allocate them into the reference framework adopted here (Figure 2.5); these articles are relatively new, ranging from 2006 to the present. Before proceeding with the analysis, the author divided the database considering the research target: intolerant and tolerant consumers.

In particular, 25 articles among the 45 reported the study determinants of gluten- and lactose-free food consumption in a population of tolerant consumers. Among them, 16 focused on gluten-free consumption, 5 on lactose-free, and 4 on both of these food categories. On the other hand, 18 publications involved intolerant consumers, mostly studying gluten-free consumption (16), one studying lactose-free, and one both. Finally, two articles focused on both the target to compare the results across various health conditions.

The first results, reinforce that the scientific debate is particularly focused on the study of healthy consumers, even if the numbers describe a substantial comparable subdivision between intolerant and tolerant targets.

The second step, will help to determine in greater depth how authors have focused on studying these two consumers' populations and if it is possible to track the differences and similarities useful to add a dowel to the study of this phenomenon.

3.2.1 Facilitators and barriers of "free-from" consumption with a focus on tolerant consumers

Intrinsic and extrinsic product characteristics

In studying tolerant consumers' behaviours in food choice, the majority of the articles (15 out of 25) explored the role of intrinsic and extrinsic products' characteristics. In particular, for the intrinsic products' characteristics, we address all of those variables related to the product itself, such as consistency, texture,

taste, aroma, visual appearance, colour, and size. Among the studies involved in this review, the product's features have controversial effects on consumer choice due to their strong dependence on the carrier products (bread, biscuits, milk, and beverages, for example), the product to which the ingredient has been removed. A soft texture, for example, could be appreciable in a bread formulation and not in a biscuit's one, which could be more appreciated if crunchy. For this reason, it is difficult to categorise all of these aspects as having a positive or negative effect. However, what is important to discuss is the relevance they have in consumer evaluation and choice of a product. For example, Krupa-Koza and colleagues (2019) evaluated the introduction of broccoli leaf powder on both the nutritional quality and palatability of mini sponge cakes, finding that a moderate amount of this ingredient improves the attractiveness and palatability of gluten-free products. Moreover, Morais and Rodrigues (2018) proposed a new formulation of a lactose-free cashew nut almond beverage, similar to a chocolate milk beverage. They substituted carob powder for cocoa and verified that sucrose concentration has a great influence on the sensory acceptance of the beverage from consumer perspectives. Extrinsic characteristics were also considered. Five articles addressed the role of these variables. The author addressed them within these areas: labelling, nutritional information, and functional claims, which seem to play the role of facilitator in consumption (i.e. Hartmann, et al., 2018; Rebouças et al., 2017), because of their role in supporting consumers in the choice processes. Christoph and colleagues (2018), for example, analysed the positive contribution of nutritional facts and production methods (organic, in particular) in valuing gluten-free consumption.

Consumers' biological and physiological factors

Consumers' biological factors were also discussed: 6 articles out of 25 focused on these factors. In greater details, the role of the age was discussed as having a different impact on consumption: Zingone and colleagues (2017) found

that younger consumers (18-34 years) were keener to consume lactose free products, while other authors instead supported the positive predisposition of older consumers towards gluten-free wafers (De-Magistris, Xhakollari and De Los Rios, 2016). Also considering gender, authors appeared discordant about the role of this variable in segmenting people's behaviours. In particular, some authors asserted that females are more oriented to free-from products (Laheri & Soon, 2018; Zingone et al., 2017). In other contributions, female heads of households emerged as less keen to buy free-from-lactose milk (Gulseven & Wohlgenant, 2017). Within the contributing literature, authors identify a positive predisposition to choice of free-from products in the minorities (Gulseven & Wohlgenant, 2017), particularly towards gluten-free products among Hispanics (Christoph et al., 2018; Priven et al., 2015). Moreover, physical indicators of healthy factors (i.e. fruit and vegetable consumption, specific weight goals, glycaemic index) are demonstrated to play a role in determining consumption of products (Christoph et al., 2018; Hartmann et al., 2018; Rebouças et al., 2017; Cabrera-Chávez et al., 2017; De Magistris, Xhakollari and Munoz, 2015). Thus, gastrointestinal symptoms are perceived as a facilitator for lactose-free consumption (Zingone et al., 2017).

Consumers' psychological factors

Finally, few articles studied the role of psychological factors: Owusu and colleagues (2017) demonstrated the positive impact of product awareness (cassava-blended flour bread) on willingness to pay more for a free-from food. Moreover, Priven and colleagues' research (2015) studied the positive role of familiarity in determining an approach to a free-from product, which means that the more accustomed the consumer is to these products, the more keen he will be to try them. Familiarity is expressed by cognitive-behavioural processes, which orient consumers' decision-making.

Socio-cultural factors

Two articles explored the facilitation of sociocultural factors: trust in actors in the food domain (Hartmann et al., 2018) and religiosity and moral foundation (Minton et al., 2019) were associated with a more positive approach to this consumption.

No situational factors were found.

In summary, the determinants of consumers' behaviours have been identified and mapped according to the 6 areas of the theoretical framework previously described (Section 1). The area of products' characteristics (intrinsic and extrinsic) appears more studied for this target, even if it is difficult to attribute them to a univocal role, as pointed out in the results. Only the nutritional facts and labels emerged as facilitators. Little attention has been given to the consumers' perspective and the psychological, socio-cultural and situational factors. Appearing to be facilitators are the levels of consumer awareness and familiarity, trust, and the religious and moral sphere. Biological and socio-demographic factors have been studied, with findings that confirm the positive predisposition and health condition of minorities. The role of age and gender remains in doubt.

3.2.2 Facilitators and barriers of “free-from” consumption with a focus on intolerant consumers

Eighteen publications have studied the determinants of gluten- and lactose-free consumption on a population of intolerant consumers. As before, in line with our objectives, we first mapped the determinants of consumption of these foods, identifying also their role as facilitators or barriers, and then we attributed these variables to the conceptual areas inspired by the model of (Köster & Mojet, 2018).

Intrinsic and extrinsic product characteristics

Nine articles focused on both the intrinsic and extrinsic product characteristics. More specifically, the intrinsic characteristics for tolerant consumers were also in this case multifaceted and non-univocally attributable as facilitators or barriers. Again, the authors explored the role of aroma, visual appearance, and flavour, which emerged as having different impacts on consumers' food choice behaviours, mostly depending on the carrier product (i.e. Campo et al., 2016; Morais et al., 2014; Potter et al., 2014). Moreover, we identified three main variables related to the positioning of the products in the market, which are the high price and the scarce availability of these products in supermarkets, transversally considered as a barrier (Szucs et al., 2019; Sálková and Hosková, 2016; Do Nascimento, 2014). In contrast, offers and discounts are perceived as positive for consumers (Sálková and Hosková, 2016), like the label, which was perceived as having a positive role in consumer choice (Szucs et al., 2019; Zarkadas et al., 2006).

Consumers' biological and physiological factors

With regard to consumers' biological factors (present in 6 articles), for intolerant consumers, age played a discordant role. Finally, for intolerant consumers, ethnicity seemed to have no impact, contrary to the tolerant target (Palacios, 2010), even if Szucs and colleagues (2019) found differences in Hungarian and Romanian intolerant consumers upon following the gluten-free diet. A particular inclination of the Romanian population is valuation of the internal product factors. Finally, Laheri and Soon found a positive predisposition of woman to follow a gluten-free diet, thus identifying the facilitator role of gender (female).

Consumers' psychological factors

For the intolerant population, moreover, more psychological variables have been studied. In particular, 4 contributions focused on the role of the

psychological status of the consumers' choice. Some authors referred more to the psychopathological aspects, such as Norwood and colleagues (2019), who found that people on a gluten-free regimen (independent from the health condition) have a similar psychological profile to people with follow no diet restrictions. They were described as having low eating disorder scores, low food craving scores, but higher stress levels. In contrast, other authors found that depression symptoms, perceived quality of life, and maladaptive coping strategies have an impact on consumers' adherence to a gluten-free diet (Tokatly Latzer et al., 2018; Sainsbury, Mullan and Sharpe, 2015; 2013). This finding supports the idea that psychological determinants could be a barrier to adherence to a diet that makes relatively profound changes in people lives. This aspect could be potentially neglected by healthy consumers who deliberately decide to change their diets, thus becoming risky for their quality of life and diet management. Other authors focused on the role of learning aspects, such as previous experiences (Sainsbury, Mullan & Sharpe, 2015).

Situational factors

As situational aspects, two articles discussed the positive role of habits in steering actual intolerant consumers towards gluten-free products (Kothe et al., 2015) and the positive influence of familiarity with the personnel of a restaurant on consumer adherence to gluten-free foods (Sálková & Hosková, 2016). These aspects are indeed the results of individual processes in relation to the context elements that could create a supporting or non-supporting condition in the food choice behaviours and play a key role in determining the positive approach of intolerant consumers to free-from products. Particularly for this target, however, appeared consumers' age at the time of diagnosis, even with no concordance among the contributions. Schilling and colleagues (2018) found the positive impact of age at diagnosis, supporting that children diagnosed before 2 years would more probably adhere to the prescribed diet. On the other hand, Tokatly and

colleagues, in the same year, found no correlation between the age at celiac disease diagnosis and adherence to a gluten-free diet, even if the age span considered was different (in this study the age at diagnosis mean was 10,5 years).

Socio-cultural factors

Finally, the area involving the socio-cultural factors: these aspects, in particular, have been studied by scholars in three articles as potential barriers to an adequate consumers' behaviour: social pressure (Do Nascimento et al., 2014) and being discriminated by others (Zarkadas et al., 2006) have been identified as barriers. In contrast, more recently, Schilling and colleagues (2018) reported that children's participation in social events (such as birthday parties) showed no higher transgression to the diet. This contrasting phenomenon probably could be attributed to the fact that the psychological aspects alone could play a different role in orienting consumers' behaviour choice of free-from products, but if considered in relation to the broader and social and cultural environment, they assume the role of barriers for intolerant consumers.

In synthesis, product-intrinsic characteristics have been studied, but no univocal effect was reported. High price and scarce availability of the products in the supermarket, as product-extrinsic characteristics, however, were a barrier to consumption. This appears as a key result, considering the market positioning of these foods. Moreover, when studying the consumption of free-from gluten and lactose products on a target population of intolerant consumers, scholars have focused more on the psychological and socio-cultural aspects than on the products' characteristics (as happened for the target of tolerant consumers). These aspects have a different impact, but all of the authors here mapped these variables as the presence or absence of psychopathological issues related to consumption. Both the psychological and socio-cultural variables have been studied in terms of the potential psychological risk for these consumers. Finally,

generally socio-demographics and product-related factors have different impacts that are non-determinable in terms of facilitators or barriers, as happened in the tolerant target. In this target, gender (woman) has resulted as a facilitator.

A summary of consumers' determinants is reported in Table 2.1.

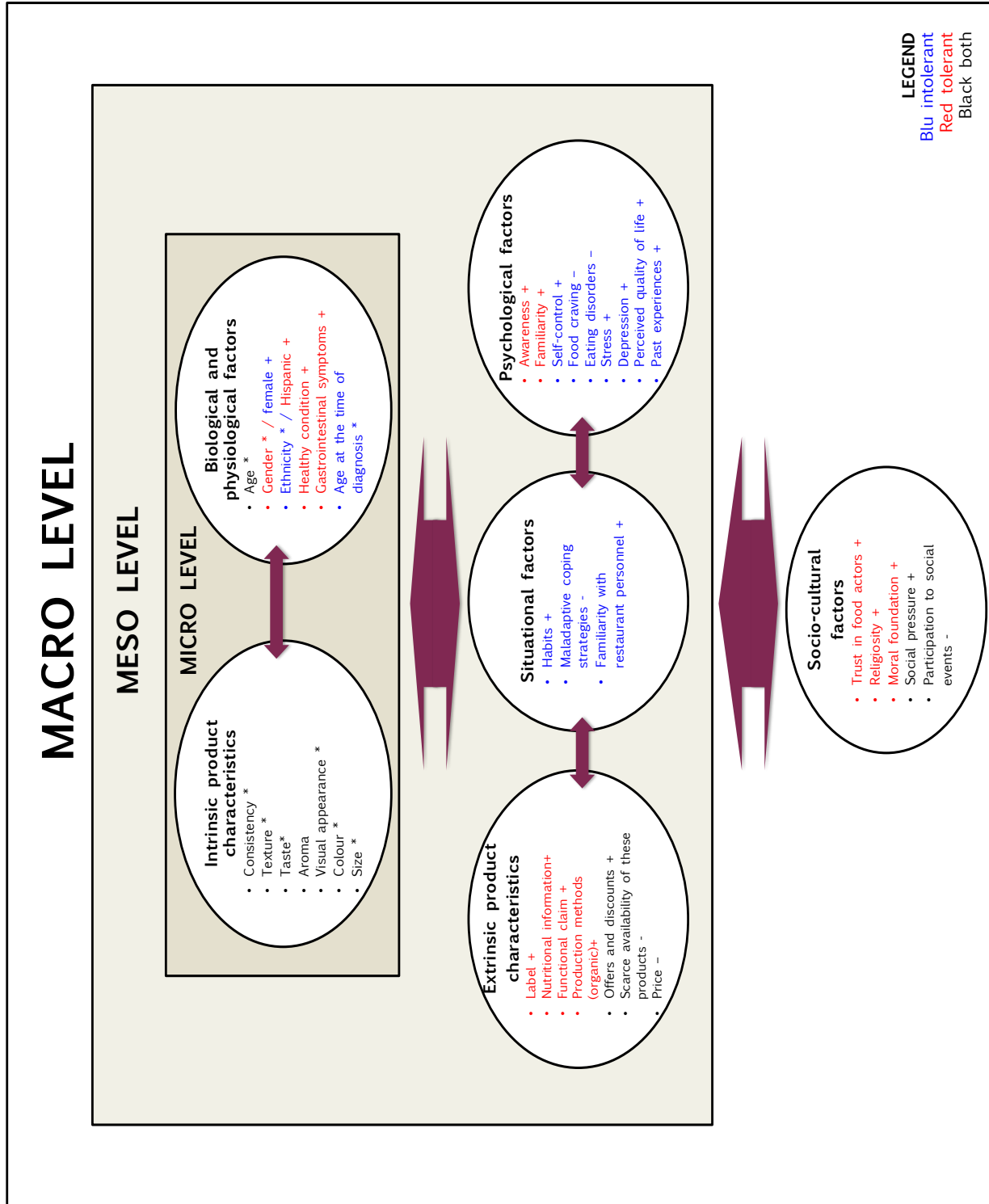
Table 2.1 Determinants' summary and related references

DETERMINANTS	REFERENCE
Intrinsic product characteristics	Ziarno et al., 2019; Szucs et al., 2019; Krupa-Kozak et al., 2019; Morais & Rodrigues, 2018; Owusu et al., 2017; Alvarez et al., 2017; De-Magistris, Xhakollari, & De Los Rios, 2016; Campo et al., 2016; De Magistris, Xhakollari, & Munoz, 2015; Dos Santos et al., 2015; Gil-Humanes et al., 2014; Do Nascimento et al., 2014; Morais et al., 2014, Potter, Stojceska, & Plunkett, 2014; Capriles & Areas, 2013; Hadnadev, Torbica, & Hadnadev, 2013; GuardeÃco et al., 2013; de Morais, Cruz, & Bolini, 2012; Laureati, Giussani, & Pagliarini, 2012; Sae-Eaw et al., 2007
Biological and physiological factors	Szucs et al., 2019; Norwood et al., 2019; Schilling, Yohannessen, & Araya, 2018; Christoph et al., 2018; Hartmann et al., 2018; Laheri & Soon, 2018; Tokatly Latzer et al., 2018; Zingone et al., 2017; Cabrera-ChÃvez et al., 2017; Gulseven & Wohlgenant, 2017; Parviainen et al., 2017; De-Magistris, Xhakollari, & De Los Rios, 2016; Salkova & Hes, 2016; de Magistris, Xhakollari, & Munoz, 2015; Priven et al., 2015; Keith et al., 2011; Palacios et al., 2010
Situational factors	Priven et al., 2015; Sainsbury, Mullan, & Sharpe, 2015; Sainsbury, Mullan, & Sharpe, 2013; SÃlkovÃ & HoskovÃ, 2016
Psychological factors	Szucs et al., 2019; Norwood et al., 2019; Soon, 2019;Owusu et al., 2017; Kothe et al., 2015; Sainsbury, Mullan, & Sharpe, 2015; Sainsbury, Mullan, & Sharpe, 2013
Extrinsic product characteristics	Szucs et al., 2019; Soon, 2019; Laheri & Soon, 2018; SÃlkovÃ & HoskovÃ, 2016; Salkova & Hes, 2016; Do Nascimento et al., 2014; Zarkadas et al., 2006; Christoph et al., 2018; Hartmann et al., 2018; Parker, 2017; Rebouças et al., 2017; Zingone et al., 2017
Socio-cultural factors	Szucs et al., 2019; Schilling, Yohannessen, & Araya, 2018; Do Nascimento et al., 2014; Zarkadas et al., 2006; Minton, Johnson, & Liu, 2019; Hartmann et al., 2018

3.2.3 A new integrated model of free-from-lactose and -gluten consumption

As described in the Introduction, a final step was undertaken, aiming to create a new conceptual model applying an ecological perspective to the variables previously identified and grouped. An additional aim is to highlight in this model eventual differences and similarities between the two targets of tolerant (Section 3.2.1) and intolerant people (Section 3.2.2). A graphical representation of this model is proposed here (Figure 2.5).

Figure 2.5 An integrated model of consumer behaviour determinants in free-from-lactose and -gluten food consumption¹



¹ In the model the symbol + represents a positive effect of the variable in contributing to the consumption; - represents a negative effect; * represents no univocal effects among the selected studies.

4. Discussion and conclusion

4.1. *Expanding the research lens*

In this chapter, we address the need to explore the scientific literature about free-from-gluten and -lactose consumption. The topic appeared to be fragmented and lacked study from a broader perspective that could give reasons for the complexity of this phenomenon. In particular, we opted for a systematic integrative review, which appeared the best method to clarify the boundaries of a phenomenon and to map some key aspects (Torraco, 2016). Framing of the 6 conceptual areas described by Koster and Mojet (2018) into an ecological perspective allowed the author to propose a new conceptualization of the consumers' behaviour determinants here analysed, highlighting the eventual differences and similarities between two targets: tolerant and intolerant consumers. In greater detail, we started with the definition of a search string that was broad enough to capture various aspects of consumer behaviour but still focused on the research objective. In doing so, we included the words related to the two food categories under investigation (gluten and lactose) and the synonyms related to consumers' behaviours in consumption so to include all of those behaviours related to food choice. The articles collected were subjected to a two-step analytical process. In the first database of articles (N=361), the author proposed a first step of the critical analysis of the scientific debate, with the goal of highlighting actual gaps and opportunities for future research. From this first step, we drew some interesting preliminary conclusions here to be discussed. In particular, the first results highlight the primacy of the hard sciences in the analysis of this phenomenon. The majority of the publications belong to the area of agriculture and food science, nutrition and health, and a residual part to the economical aspects and consumer studies. In these works, consumers are relatively present, as we'll discuss later, but still from an objectivized perspective. Similarly, we went through the methodologies adopted by these authors, noting that only a small number (19 articles) used a qualitative strategy, alone or in

combination with a quantitative method. Again, qualitative methods, by nature, can be used to examine phenomena related to the individual and social construction of facts and behaviours and to give voice to the hidden surface of these phenomena (Lewis, 2015). Moreover, the works that applied a qualitative method were aimed at analysing consumers' perceptions, beliefs, and attitudes that are important determinants of the behaviours but don't give reason for the hidden psychological processes.

Briefly, as the consumption of free-from food has transformed itself in the last years, moving from being an offer for people with nutritional needs to being a social and health phenomenon, it becomes necessary to involve other disciplines in the study of its constituent determinants. The inclusion of more social disciplines, such as psychology, sociology, and consumer sciences, for example, could help in finding new important interpretations of consumers' behaviours. Moreover, this will allow us to transform this knowledge into proper and indicated actions to undertake among policy makers in food and health disciplines. To put a first dowel into the understanding of a broader consumers' perspective, in the following paragraph, the author will propose a new conceptualization of consumers' behaviours of free-from-gluten and -lactose choice, divided by the two targets under investigation: tolerant and intolerant consumers.

4.2 Re-conceptualizing free-from-gluten and -lactose consumption

Through the second phase of qualitative synthesis, it was possible to map the concepts used to describe the determinants of consumption and to address them to the six conceptual areas described by Koster and Mojet into their model (2018). This phase allowed the author to address the need to bring together the fragmentation of the actual scientific literature. The author approached this analysis from an ecological perspective, with the aim to propose a new conceptualization of this phenomenon by using a broader model of interpretation

(Stokols, 1992), highlighting similarities and differences between the two targets. Some considerations will follow.

In the two results sections (see Paragraph 3.2.1 and 3.2.2), the author mapped the role of consumers' determinants in free-from-gluten and -lactose consumption. In particular, transversely to the targets, the product-related intrinsic characteristics have been studied with certain variability regarding their impact as facilitators or barriers, because of the complexity of the many elements for verification. As discussed before, the characteristics related to the intrinsic properties of the product are strongly related to the carrier product itself, and with many other variables, such as the context of consumption and the consumers' individual sensory perception (Di Cairano, Galgano, Tolve, Caruso, & Condelli, 2018; Suri et al., 2019). Although these results don't highlight differences between the targets considered here, it is important to notice that these variables play a key role in the orientation of food products, particularly for a peculiar target (such as people with health issues that could alter consumer senses), even if their role is difficult to address regarding only one possible impact. For this reason, research should address these variables in relation to other consumers' factors in order to grasp the complexity of a changeable food consumption.

Extrinsic products characteristics, in contrast, appear to have a different effect on tolerant and intolerant consumers. If for the tolerant people the determinants of the consumption are related to the areas of health (nutritional facts, functional claims) and sustainability (organic production) with a positive impact, the ones having effect on intolerant people are instead more focused on the economical and marketing aspects, such as the high price and scarce availability of these products in supermarket (as barriers) and discounts and offers (as facilitators). These results confirm some of the considerations present in the scientific debate, which have already highlighted the strong connection between consumers' health predisposition and free-from food consumption (Allen, Goddard, & Farmer, 2018; Hartmann, Hieke, Taper, & Siegrist, 2018; Jung, Kim, & Yoon,

2017) among tolerant and intolerant people. Thus, the role of price as a barrier for intolerant consumers to adhere to the special diet (Tomar, 2014; Villafuerte-Galvez et al., 2015). Considering the barriers, it can be approached as both a recent market trend and a topic of scientific debate, as the extrinsic factors for tolerant consumers related to the price have not been taken into consideration as among the determinants here analysed. A hypothesis for this particular aspect could be supported by the fact that, as the consumption of this product from tolerant consumers is increasing in the market trends, it seems not to affect consumers' behaviours among those who still buy these products in any case. It could be potentially interesting, however, for scholars to understand the influences behind consumers' choice to overcome the barrier of price, which for intolerant people is perceived as problematic. It could be that more introspective and psychologically strong motivations could orient this behaviour, but research still needs to be done in order to verify this idea.

Another conceptual area discussed in the model is related to consumers' biological factors, such as age, gender, gastrointestinal function, and genetic factors. In this review, it was possible to map some of these variables, but no univocal impact was found. It was however possible to highlight some differences between the two targets. In particular, if the variables regarding tolerant consumers are more related to gastrointestinal symptoms and negative health conditions were mapped as contributing to the free-from food choice (Christoph et al., 2018; Zingone, Bucci, Iovino, & Ciacci, 2017), the study of the intolerant target could be more focused on the role of age at the time of diagnosis, for example in the case of gluten-free diet adherence (Schilling, Yohannessen, & Araya, 2018). It emerges again as a study of tolerant consumers in choosing free-from-gluten and -lactose food, which is strongly focused on the health condition, but most of the time, these conditions are perceived as not medically defined.

Regarding situational factors affecting consumer decisions toward free-from-gluten and -lactose foods, it is possible to track some differences in the two

targets. For only the intolerant target, it was possible to track some determinants related to the contextual factors that accompany this food experience. Consumers can adopt coping strategies in different situations and find in the restaurant personnel a sense of familiarity; these are considered facilitators of consumption. Moreover, variables related to the socio-cultural sphere were investigated, again on two different levels depending of the target. For tolerant consumers, cultural factors are more related to the capability of consumers to internalize this social influence in terms of trust (Hartmann et al., 2018) and moral values (Minton, Johnson, & Liu, 2019). On the other hand, for intolerant consumers, the variables impacting their behaviours are those connected to social pressure, which also refers to the external environment (Do Nascimento, Fiates, Dos Anjos, & Teixeira, 2014). However, it is possible to assert that the consideration of the social influences analysed here is strongly restricted to the influences indirectly faced by the consumer. This appears to restrict the meaning of these variables that leave behind factors related to social influence such as imitation, group belonging, and social identification, which still can have an impact on food choice (Cornejo Happel, 2012; Hardcastle, Thøgersen-Ntoumani, & Chatzisarantis, 2015). Finally, the psychological variables were more thoroughly studied in relation to intolerant consumers. In particular, the set of variables discussed here express a more pathological perspective on this phenomenon. Authors have focused on the impact of stress, depression, food-deviant behaviours, poor quality of life, and eating disorders, which have been studied in relation to the free-from diet (Conner, Miroso, Bremer, & Peniamina, 2018; Jones, O'Connor, Conner, McMillan, & Ferguson, 2007; Konttinen, Männistö, Sarlio-Lähteenkorva, Silventoinen, & Haukkala, 2010). Less attention has been given to the psychological factors related to the possible role of inner and deeper psychological consumers' processes (self-projectuality, life orientation), particularly for tolerant consumers. These variables could be a key to interpret some of the elements that seem to have no explicit explanation in this target, for example the fact that price doesn't emerge as a

barrier for tolerant consumers or that the health condition has an impact on consumption orientation, but most of the time with no specific medical need.

Finally, inspired by the original ecological theory developed by Bronfenbrenner (1979), the author organized the variables mapped into 3 levels of increasing complexity. The *micro level* includes all variables related to consumers' biological and physiological factors and the intrinsic product characteristics. These variables relate directly to the consumer or the product. The *meso level* includes all extrinsic product characteristics, including the consumers' psychological factors and situational factors. This is because these variables are conceived in relation to other elements; for consumers, in particular, both the psychological and the situational variables can be described only in relation to the close environment of reference. The external product characteristics, moreover, are the results of the relation between the product and its market. The *macro level* includes socio-cultural factors, and it expresses the role of all of these systemic variables, which frame general consumers' behaviours into their context of reference. In this conceptualization, moreover, all levels of influence are considered to have the same importance, and for this reason, the use of multi-level methodologies is here suggested to better explain people's behaviours (Golden & Earp, 2012). Moreover, this approach can enrich the way scholars study consumers' behaviours, including in the same framework different models, because a multilevel ecological framework can lead investigators to select individual, relational, and contextual models that can guide the development of comprehensive studies and interventions. The challenge in the field of free-from food consumption could be to identify from the available literature the theories and models most appropriate and influential for the purpose, behaviour, and population of interest (Glanz, K., Rimer, B.K., & Viswanath, 2015). This appears of particular interest when considering the premises of this study in terms of the complexity and the changeability of the phenomenon of free-from consumption in the modern food scenario.

The re-conceptualization within this study is a first step in the direction of a more integrative and comprehensive study of the free-from-gluten and -lactose consumption. This phenomenon appears complex, and the aspects differ concurring with consumers' choice, product characteristics, and consumers' preferences and psychosocial factors. In the attempt to face and organize this complexity, in this study, the author proposes a new conceptualization of this phenomenon through an ecological perspective, but further research is needed in order to decipher consumers' behaviour. Being aware of the impossibility to apply the conceptualization proposed for future research, a suggestion could be to try to shed new light on some traditional variables (product-related, biological, and socio-demographical variables, for example) with some psychological hints. Moreover, it would be interesting to analyse some of the social variables still not used, in particular when the free-from choice is voluntary.

4.3. Moving towards new theory building

One last point needs further consideration. The author highlighted that, as the current scenario in the field of free-from-gluten and -lactose consumption calls for an extension of the paradigms now used, and in pursuing this objective, a more integrated perspective is needed. This appears particularly relevant upon considering the challenges of understanding some of the consumers' behaviours that seem not to be explicable with objective and extrinsic variables or for a particular target, such as the tolerant consumers. It appears that scholars' attempts to increase and to better qualify food acceptability are still focused on the products. Some insights from this review drive the last consideration to highlight the need for more research to grasp consumer direct experience, in order to determine essential aspects of this phenomenon that have not been explored until now. The free-from food consumption could be more complex than the sum of the variables yet studied. It involves individual behavioural change, intentionally or not, which is related to a deep and rooted element in people's

experiences and identities (Cornejo Happel, 2012; Ogden & Hills, 2008). The complexity of the scenario described in the Chapter 1 moreover claims that new consumer-based paradigms are needed to pursue education and intervention programs towards more conscientious food consumption.

5. References

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CHAPTER 3

UNDERSTANDING THE PSYCHOLOGICAL PROCESS OF DIET CHANGE TOWARDS THE CONSUMPTION OF GLUTEN- AND LACTOSE-FREE PRODUCTS

Abstract

New environmental, social, and economic challenges are shifting the way people approach food consumption. In addition, the increase in food-adverse reactions (such as gluten and lactose sensitivity) is raising the attention of consumers, health institutions, and food companies. The author has addressed in depth these challenges in Chapter 1, with the aim to frame new food consumption trajectories that society is questioning. “Free-from” products, in particular gluten-free and lactose-free foods, became an important trend in recent decades. However, they have brought with them some controversial economic and social issues. In this field, the contribution of the scientific debate around consumers’ behaviours is relatively recent and fragmented and lacks an integrated perspective. For this reason, in Chapter 2, we address the need to systematically read what have been written and to map the determinants of consumers’ behaviours of free-from-lactose and -gluten consumption from an ecological perspective, confronting tolerant and intolerant consumers. The author found that, among tolerant consumers, little attention has been given to the role of psychological and social variables. Moreover, few studies have involved qualitative methods to collect consumers’ experiences and stories regarding their decision to change their diet, and they thus determine the motivations and the influences to make such decisions. Finally, the author highlighted the need to build new theories from tolerant consumers’ perspective.

Is there a psychological dynamic underlining the decision to voluntarily select free-from products even with no medical need? Is it possible to track a common consumer’s journey to explain this phenomenon? What do free-from foods represent for these consumers? Which are the consumption’s practices and routines characterizing this choice?

These are some of the questions the author aims to answer in Chapter 3, describing a Grounded Theory study conducting in-depth interviews with the aim to place a magnifying lens on the process throughout which people decide to change their everyday diet into a “free-from” regimen without any medical necessity, while trying to draw a conceptual model of the psychosocial process behind this choice and mapping the variables involved. The results of this study will offer a deep understanding of these dynamics as a way to dialog with the consumers in the field of free-from food consumption.

1. Introduction

Given the importance of a balanced diet to support healthy lifestyles, the complete elimination of gluten and lactose from the diet of tolerant people could cause nutrition deficiencies and poor quality of life (Zarkadas et al., 2006). However, numerous people today still prefer these products in substitution of traditional ones, in relation to some diffused misperception of more naturalness and healthiness (Schierhorn, 2018; Zysk, Głabska, & Guzek, 2019).

As discussed in the first chapter, despite differences in aetiology and definitional framework, these foods register from a phenomenological perspective the same consumption movements. Both are rapidly increasing in the market offers, and both are gaining the attention of consumers, health institutions, and companies for their promising developments as well as related challenges. Despite this increasing attention, little is known about this phenomenon from the consumer point of view and the reasons for these food consumption movements seems to be opaque in a situation governed by apparent contradictions. In the last decades, the scientific community felt the need to explore this phenomenon, particularly from a technical perspective, with the contribution of disciplines such as agriculture and biology for the understanding of the food composition and improvement (Dekker, Koenders, & Bruins, 2019; Suri et al., 2019). These subjects are examined in addition to medicine and nutrition to understand the health relation of these foods with the human diet (Hodges, Cao, Cladis, & Weaver, 2019; Vici, Belli, Biondi, & Polzonetti, 2016; Wünsche, Lambert, Gola, & Biesalski, 2018). In Chapter 2, the author took a step forward in the scientific debate by mapping basing on a broader theoretical model (Köster & Mojet, 2018) the determinants of consumer purchase behaviours of gluten- and lactose-free foods, comparing tolerant and intolerant consumers. The literature on consumer perspective appears to be fragmented and lacks a broader understanding. In particular, many are the studies that, through a top-down perspective, tried to

analyse consumers' main determinants of free-from-gluten and -lactose product purchase, but few focus on both of these food categories. However, as underlined before during the dissertation, a transversal exploration of this phenomenon could appear innovative in order to understand some consumers' key trajectories. Moreover, from the methodological point of view, most of the studies proposed a quantitative methodology (cross sectional or experimental) (Christoph, Larson, Hootman, Miller, & Neumark-Sztainer, 2018; Norwood, Cruwys, Chachay, & Sheffield, 2019; Soon, 2019), thus providing the power to verify and measure the role of these variables involved, but leaving aside customers' direct experience. The author finally highlighted some research gaps in the understanding of tolerant consumers' behaviours, particularly if considering the psychological perspective.

Having these premises in mind, the aim of the present study is to investigate the experience of people who decide to voluntarily change their diet from a traditional to a gluten-free and/or lactose-free diet. We particularly want to trace the process that characterizes this moment by investigating the phases, the significant influences, the variables involved, and the psychological fallouts of this change on consumers' broader lives. The result will be a conceptual and experience-based model of this process, highlighting the main key points and discussing the relative implications for consumer understanding and education.

2. Methods

Among the various and diversified methodologies available for qualitative research, the Grounded Theory turns out to be the one that best fits with the objectives of this thesis work.

This method turns out to be a powerful tool for the social sciences, since it allows researchers to explain what is happening within a given context or at a particular moment, with reference to the psychosocial process under investigation (Morse et al., 2016). The research questions typically refer to the Grounded

Theory approach and derive from the attention to the processes of change and social construction in order to identify stages and phases. The basic assumption is that, through detailed exploration and guided by theoretical sensitivity, the researcher can construct a theory based on data (Lauridsen & Higginbotton, 2014). Here the aim is to build a theory that explains the psychosocial process leading to a diet change and how it impacts consumers' lives in a broader sense.

The main features of the Grounded Theory relate to the fact that it is "grounded" and "theoretical." This means that the phenomenon should not be simply described, but also involves the development of a theory about it and the construction of a model as an output (Charmaz, 2014). Through this theory, researchers move from a descriptive classification of events and facts to an abstract theory of the phenomenon, which takes into account relationships and processes. "Grounded" refers to the fact that the theory must emerge from the data, and not from a predetermined hypothesis (Murray & Chamberlain, 1999). As a starting point, the facts and events related to that specific phenomenon are considered which progressively develop into increasingly abstract classifications and categories. The type of reasoning used is inductive, which starts from the data to construct theory, instead of using the same data to test the hypotheses previously constructed. This allows us to take a step forward in the study of this phenomenon and to grasp some deep and hidden aspects that cannot be captured with top-down methodologies. The author here adopted a constructivist grounded theory approach (Charmaz, 2014).

2.1 Study setting and participants

To better describe this methodology, it is necessary to consider the entire research path as a process, during which the collection and analysis of data are continuously intertwined; this strategy guarantees that the researcher obtain the necessary density and saturation for the recurring categories, and to keep under control any unexpected results. Cross-referencing data collection and analysis in

this way is also useful for increasing insights and clarifying the parameters of emerging theory (Murray and Chamberlain, 1999).

Grounded Theory does not require a particular source of data, but it must allow the exploration of the phenomenon, constant comparison and reflection, and finally the construction of a theory. Sampling takes place according to the logic of theoretical sampling, which refers to searching and collecting pertinent data to elaborate and redefine the categories underlying the emerging theory (Charmaz, 2014). It begins with a first collection of data followed by the construction of explanatory hypotheses of the information obtained and continues with the verification/falsification of the latter through further empirical research (Dey, 2004). This sampling strategy allows delineating and developing the properties of pivotal categories and their range of variation. In line with this sampling strategy and in tune with the research's objectives, in a first step the author recruited people to apply the following the maximum variability criteria (Morse & Richards, 2002), which includes defining some criteria and trying to diversify the participants. In a first moment, the author decided to apply these inclusion criteria for the participants of the study: 1) had experienced a change to gluten- and/or lactose-free diets at least 6 months before and 2) had no medical diagnosis related to food intolerance. These differences were taken into account to build the conceptual model emerging from this study. Following the theoretical sample guide, in a second recruitment step, we decided to diversify the time span by involving people with long experience with change (at least 5 years), with medium experience (at least 2 years), and short experience (at least 6 months), filling the gaps starting from the people who were already recruited and adding cases where needed. This time schedule was decided based on the first interviews collected and consensualizing it with the participants, with the aim to catch the dynamism of this experience and to facilitate eventual psychological processes. Moreover, according to the emerging results, the author decided to involve some intolerant consumers, who have undergone medical exams to confirm their intolerance, to

corroborate the first results that emerged, in a “critical case” sample logic (Morse & Richards, 2002). The exploration among intolerant consumers was conducted with the aim to discuss preliminary results; consequently data saturation was followed in this case. Demographics (gender, age, profession) were also taken into account.

The author stopped sampling when reached data saturation, that is, when no new emergent themes were generated from the interview data (Morse & Richards, 2002). Consumers were recruited among the network of known people, using leaflets and announcements on social media and out of places related to the topic (supermarkets, restaurants and bars, universities, etc.). The author further selected people who exhibited the inclusion criteria: the ability to speak and understand Italian, aged more than 18 years, and having no cognitive (reading, listening, speaking) impairment in order to complete the interview or the written consent form. All participants completed informed consent after that the purpose of the study was thoroughly explained. The study was approved by the Ethical Commission of Università Cattolica del Sacro Cuore (CERPS).

2.2 Data collection

Interviews took place in a university office, reserved for the time needed, in order to guarantee a silent and comfortable situation for the participants in the period between December 2017 and June 2018. During the fulfillment of the informed consent, the participants were asked to give permission to be audio recorded anonymously, and the recordings were to be kept in a private space in the university office. The interviews were built with a semi-structured track, allowing the researcher to be close to the research aims but also to move with elasticity among the themes spontaneously emerging from participants’ stories. The interviews lasted on average 45 minutes. In line with the iterative nature of Grounded Theory, data collection and analysis occurred concurrently (Charmaz, 2014). Interviews were transcribed verbatim, read/re-read, and analyzed throughout

the course of the study (see Paragraph 2.3). During the data collection process, the interview guide became progressively focused so that concepts constructed from data analysis could be pursued and ideas explored (Table 3.1). The author, expert in qualitative methods, conducted in-depth interviews to elicit consumers' extended narratives about their experience of changing diet, modulated in different conceptual areas. According to the theoretical strategy, interviews from the first recruitment step enabled the researchers to define first the preliminary results that were discussed and validated, with the consumers recruited in the second step.

Table 3.1 Interviews' track

AREA OF INVESTIGATION	QUESTIONS
Opening question	<i>Please tell me how these "free-from" foods have entered your daily life since you started buying them to today.</i>
Time development: crucial phase events of change	<i>When did you start buying these products?</i> <i>Let's try to go over the process in detail, step by step.</i> <i>What do you think are, in your experience, the main steps you took?</i>
Motivation for the choice	<i>Was there in your experience a particular event that led you to buy these products?</i>
Focus on the products	<i>What are the "free-from" products that you buy most often?</i> <i>According to what criteria did you choose these products rather than others?</i> <i>What positive or negative elements did you encounter when buying these products?</i>
Role of "others"	<i>Is there anyone (family, friends) that is involved in these food choices? If so, what role do they play?</i>
Role of the information and media	<i>How do you collect information about these products?</i> <i>Which are in your experience the most used sources of information about food?</i>
Attitudes toward being free-from food consumers	<i>What kind of consumer were you before you started buying these products? What were the factors that guided you in your food choices?</i> <i>And how would you describe yourself as a consumer today? Has something changed? Which are your drivers in your food choices?</i> <i>Have you changed your way of eating in general since you started using these products?</i> <i>Are food consumption choices relevant to you? Do you feel you are the protagonist of these choices, in general and linked to "free-from" products?</i>
Final questions	<i>How would you define your diet choice today?</i> <i>Are you satisfied? Is there anything that you would change or return to?</i>

2.3 Data analysis

The author analyzed the interviews through an iterative process that took place at the moment of data collection. The analytical process in Grounded Theory takes place through successive steps (Charmaz, 2014):

1. *Initial coding*: during this coding phase, the researcher takes into consideration fragments of texts (words, phrases, segments) strictly anchored to their meaning, so as to explore any possibility one can discern from the data. If particularly significant, the terms reported by the participants as in vivo codes are taken into consideration.

2. *Focused coding*: the most significant or most frequent codes are used to sift through a greater amount of data. This step requires the researcher to make decisions about which codes best express the analytical meaning of the text to categorize the data in a complete and incisive manner. The resulting categories are more summarized and conceptualized than the previous ones (Charmaz, & Belgrave, 2007).

3. *Axial coding*: This method allows researchers to link categories and sub-categories, specifying their properties and dimensions, assembling the previously fragmented data during the initial coding to provide consistency to the analysis (Strauss and Corbin, 1997), and synthesizing and organizing a large collection of information. This phase allows us to "create a dense texture of relationships around the axes of the categories" (Glaser & Strauss, 2017).

4. *Theoretical coding*: introduced this coding phase to conceptualize how "the categories are linked together to be integrated later into a theory," specifying possible relationships between categories developed in the previous phases. In this last phase, the core category is identified as the central one, which has the highest frequency of occurrence, creates excellent connections among the others, and has strong implications for the generated theory (Glaser & Strauss, 2017).

Other tools used during this research data collection and analysis were the so-called "memos". Memos were used to collect the thoughts of the researcher, record the comparisons and the connections that are created, and crystallize questions and new directions for the continuation of the work (Glaser & Strauss, 2017; Pandit, 1996). The memos represent an intermediate step between data collection and text writing. They constitute a crucial moment in the Grounded Theory process, because they facilitate the analysis of data and codes during the first moments of the research. During the writing, the author tried to bring out new insights and ideas about the phenomenon by reading and discussing the emerging results; putting everything down on paper makes it manageable and concrete and provides the freedom for the researcher to be engaged in his material. The integration phase allows memos to be put together with empirical data (Lempert, 2007). The right time to stop in the data collection and analysis process is when saturation is reached; that is, when the data do not produce fresh ideas, new insights, or new properties with respect to the identified categories (Charmaz, 2014). Finally, integrative diagrams were also written throughout the process in order to better illuminate the data analysis. The analytical procedures described above were applied to transcripts of the interviews. During this process, the researchers held several meetings to discuss their analytical insights and interpretations (Richard and Morse, 2012; Tarozzi, 2008). Through this analytic process, the author reached a satisfying version of the model proposed.

3. Results

The author collected 30 interviews, both from gluten- and lactose-free food consumers. In Table 3.2 we report all of the sample details.

Table 3.2 Participants' characteristics

PARTICIPANTS = 30		
<i>Gender</i>	Male	11
	Female	19
<i>Age</i>	Under 25	14
	26-35	9
	36+	8
<i>Employment</i>	Student	13
	Workers	17
<i>Time from diet change</i>	6 months to 2 years	12
	From 3 to 5 years	10
	More than 5 years	8
<i>Diagnosis</i>	Tolerant	17
	Intolerant	3

In the next paragraphs, the author will report:

- the description of the multicomponent DNA² of the main process that flows to the definition of the 4 phases (see Paragraph 3.1);
- the description of Phase Zero (see Paragraph 3.2);
- the examination of the breaking event related to the change (see Paragraph 3.3);
- the detailed description of each phase (see Paragraph 3.4, 3.5, 3.6);
- the Core Category, labelled “looking for a perceived balance,” which is

² The acronym DNA is here used to metaphorically express the idea of one pivotal psychological core characterizing consumers' change, as composed by different elements, such as the biological human DNA.

the main crucial variable characterizing all the phases (see Paragraph 3.7).

3.1 “How I Turned Free-From”: The DNA of Diet Change Towards Free-From Products

The interviews had the main aim to describe the moment at which people decided to turn to a free-from-gluten or -lactose diet in order to understand the principal motivations and the main phases. In particular, the author defined 4 phases, which will be described below. Before that, the author will focus on the evolving “DNA” that composes them to highlight how it contributes to consumers’ journey to the diet change. In particular, from the interviews it was possible to identify 3 main conceptual domains of this DNA: one related to food and nutritional information, one related to the perceived proactivity and leadership in food and diet management, and the last related to the centrality of food in the broader emotional sphere.

Food and nutritional information

The first dimension highlighted from the interviewed is related to the informational sphere. The interviewed reported that one of the fundamental dimensions of their experience to turn to a free-from diet was related to this area, which developed during their change experience. The narrations made it possible to trace two underlined aspects: one related to cognitive skills, which means the capabilities to obtain and understand the information found. In this regard, during the process of dietary change, consumers alternate a sense of loss and disorientation in a first moment to an increasing re-appropriation of cognitive categories that allowed them to feel more aware and flexible in their free-from food consumption.

“At the very beginning, I didn’t know how to choose among these products, look a little more at the caloric values, and I rely a lot on that, even if I now realize that it is not

correct, perhaps completely, but yes I rely on that, on the calories because it was easier to understand. Now I look more the nutrients and choose based on that.”
(Woman, 1 year GF diet, tolerant)

“Previously I never read the labels, which in my opinion are instead very important. Now when I go to the supermarket I absolutely read all the labels on the products, both to see the nutritional values and to see precisely how many ingredients there are, where they come from.”
(Woman, 2 years GF diet, tolerant)

“I passed from a period that everything I have used to know about the milk was now useless, I needed to start again from the beginning to understand the nutritional aspects of these products. They say that lactose free products are for example sweeter, so I needed to pay attention to that aspect for my health”
(Man, 8 months LF diet, tolerant)

The other aspect belongs to the social and contextual factors in which the cognitive processes previously described are framed. In particular, as reported by consumers, the progressive acquisition of knowledge related to gluten- and lactose-free consumption was developed in a continuous interaction with the elements coming from the social context, such as the role of the relevant others, the information source, the historical period, and easy access to information.

“Two main factors, my mother and my boyfriend, and the people around me. Thanks to them I passed from passively eating what was available, to active deciding, and I also started to inform myself and research in the magazines, and even talking to some more experienced people”
(Woman, 5 years GF diet, tolerant)

“I read various articles on the Internet, partly after you read them, they influence you, the way you eat, the way you live. I believe that ultimately the theme of health-related nutrition is a much discussed topic in various channels, and therefore it reaches virtually everyone... at the supermarket when you go to choose certain products, the packs guide you in your choice.”
(Woman, 1 years GF diet, tolerant)

“For many things, at first glance I entrust myself to him (the husband) because he maybe gives me the input. Then over time that became my personal interest, and I started to inform through the Internet, we have seen also documentaries, there are also people who tell their experience and it gives me a way to understand more and learn more about these foods.”
(Woman, 6 years GF diet, tolerant)

“It is me who share the newest tendencies among my family and friends; it is me who studies things, then everyone does what I do, even my mother and my sister too now all go without lactose. So they too now try to eliminate it when they can”

(Man, 4 years LF diet, tolerant)

These different examples bring to light how consumers' capabilities to collect and understand information are not confined to cognitive and mental processes; they also extend to a more complex process related to their predisposition to social influence, and their sense of efficacy and confidence with themselves and with the new dietary asset. These elements in some ways modify the way this information is interpreted and used as a guide for consumption behaviours, sometimes leading to possible misinterpretation.

Perceived proactivity and leadership in food and diet management

This dimension is referred to a more behavioural consumer domain, which expresses their increasingly capability to have an active role in food and diet management, from food shopping to meal preparation. A change of diet involves many daily activities related to the food itself (for example, shopping and cooking) and to the diet management, which refers to the effort needed for the meal organization (for example to compose adequate nutritious meals). After an initial moment of disorientation with the new free-from foods, consumers reported how their relation with this diet changed. The increasingly proactivity they experienced was related to the fact that they found it more and more fulfilling to do something on their own and to be responsible and active. The passage from delegation to taking charge of the food preparation was undertaken step by step, and in doing so, the consumers developed a sense of responsibility and pleasure in being the leader of their food management.

“I became a good chef too! It was the occasion to start something on my own. I never went into the kitchen when I used to live with my parents, but now starting this new diet needed my effort in learning how to cook these foods.”

(Woman, 3 years GF diet, tolerant)

“These products are quite expensive, so I started to prepare food at home, like the bread. It was interesting to discover this side of my self, I found it nice at the end.”
(Woman, 2 years GF diet, intolerant)

“I was a passive consumer, my mom used to buy food for all the family, so I eat what was there. Now I like to go shopping and to choose accurately the food I want to eat, I like it.”
(Man, 3 years LF diet, tolerant)

“I often prepare things, especially cakes, to have the same taste, for example for the tart or the donut I just use the free-from-lactose milk to have almost the same taste of the normal ones.”
(Woman, 2 years LF diet, intolerant)

In acquiring this autonomy in relation to their food practices, consumers extended this need for leadership also to other behaviours. In other words, the process of diet change allowed consumers to perceive themselves as more capable of projecting new behavioural patterns in food and lifestyle, which would later become real and proper habits. This shift, for example, in the fact that more and more consumers decide *“to do something for themselves,”* could be practiced through buying new skin products, subscribing to the gym, or taking time for a hobby, for example, within activities in which these individuals could experiment again a sense of protagonism of their own actions. The behavioural dimension assumed in this process a pivotal role, together with the other dimensions, to bring the consumers interviewed here to acquire a perceived proactivity.

“I’m taking care of my self in this period, I like to go to the gym because I feel I’m doing something good for me, and I like to be proactive, even with my friends, I always propose new things to do.”
(Woman, 6 years GF diet, tolerant)

“I felt there was something going on in my life, and I needed to bring everything positively and with all my energies. I started feeling better, and this was a motive to start with new activities, sports... I started a course of yoga.”
(Woman, 8 years LF diet, tolerant)

“Improving my knowledge about nutrition was for me also the occasion to pay more attention to other products, such as body products. Now every evening I take 10 minutes for me, it not much time, but I need it to do something for myself and I really enjoy... I

feel better.”

(Woman, 4 years GF diet, tolerant)

Centrality of food in the broader emotional sphere

This domain could be explained in reference to a more intimate level of consumers' experiences, related to the emotions and mood, and how these elements affect – and are affected – by the new diet. In the case of free-from-gluten and -lactose dietary changes, in particular, it is possible to trace how consumers develop the capability to interpret the food choice in their broader emotional sphere through a process of increasing emotion recognition and adjustment.

In particular, the relation between food and emotions emerges here as a double-edged sword if not assimilated and used by consumers to offer a sense of their diet patterns. In a first moment, the consumers feel overwhelmed by the new food choice, and for this reason, they perceived a sense of disorientation. The emotional relation with the free-from food choice is ambivalent in terms of the alternation of emotional investment and dismissal. In this frame, the emotional investment is more related to the belly, or the hedonic dimension. Consumption of free-from food is indeed an expression of taste preferences and impulse decisions.

“When you change all your habits, it is difficult to start again, and I felt frustrated. So during the week it was easy to remain in the rule, but then in the weekend I just ordered everything I liked, feeling guilty with myself.”

(Man, 2 years LF diet, tolerant)

“The food choice is made basically on what you like, without reasoning too much. Food has to make you happy, so I just tried to follow my preferences.”

(Woman, 9 months GF diet, tolerant)

“It is difficult to give up on what you have eaten all your life, I really like milk and I cannot live without it, I have eaten since I was a child and I miss it really a lot.”

(Woman, 2 years LF diet, intolerant)

Through the process development, the free-from food choice assumed a more and more central role. The more consumers become aware of their emotions, the more these foods assume a central role in their lifestyle. On the one hand, this process allows these consumers to perceive themselves in balance; on the other it risks to bring them to over-invest in this diet as *“the only way to start feeling better again”*.

“I think that body and mind needs to go together, so it is important to have a physical results also to feel better with yourself, don’t perceive it as a restriction but just to balance your diet in a positive way.”

(Woman, 10 years GF diet, tolerant)

“Consuming free-from food was stressful, was like choosing between being happy and healthy at the beginning, but now I am aware that listening to my body is a way to be happy.”

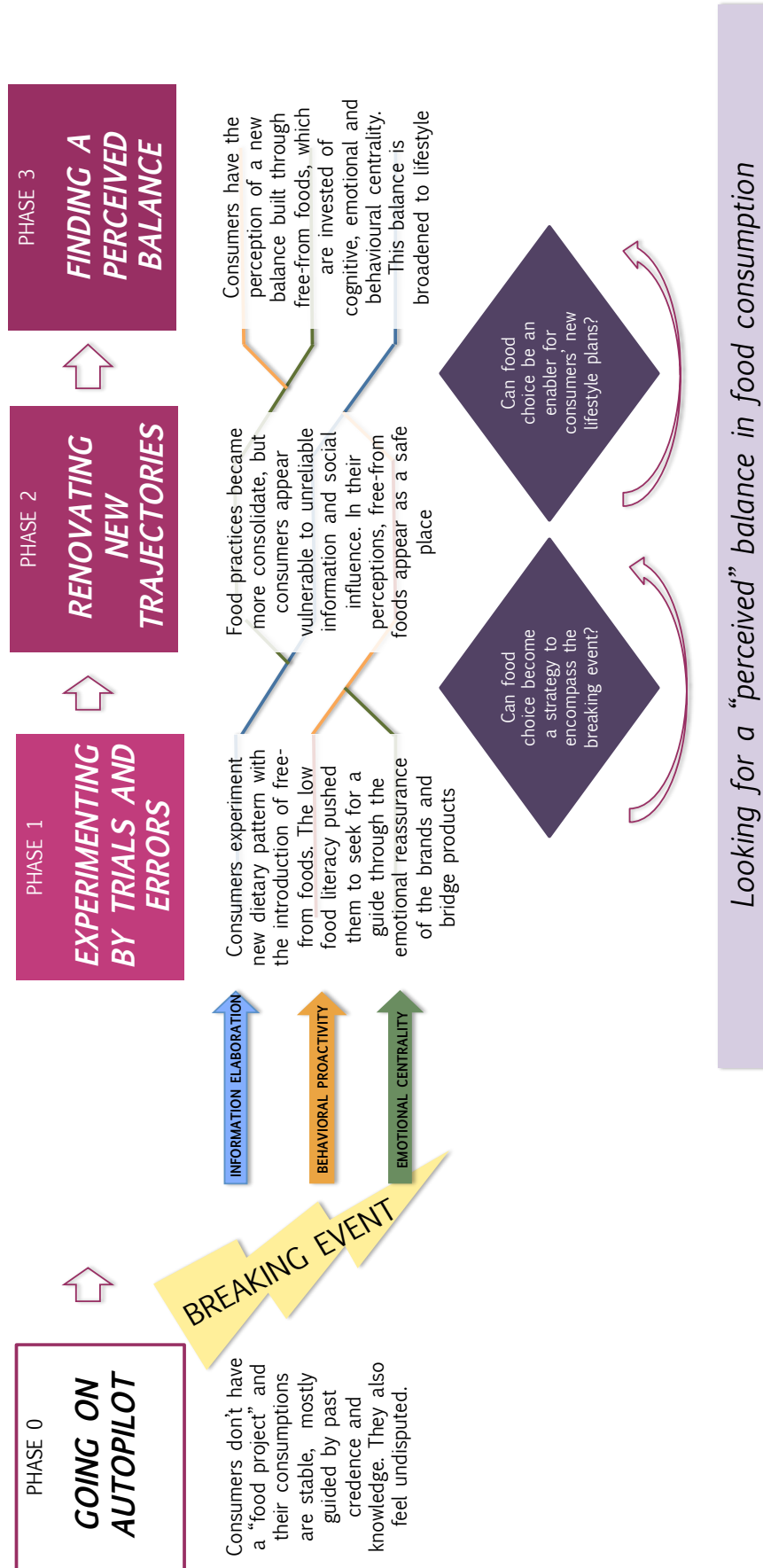
(Man, 7 years GF diet, tolerant)

“I put all myself into this choice, because to feel better it was the only thing worthing for me”

(Man, 5 years GF diet, tolerant)

Using the metaphor of the DNA helix, these three human domains can be described as interlaced and act together for the development of the process, delineating the 4 successive phases. This entire process is represented in the experience-based model in Figure 3.1.

Figure 3.1 The graphical representation of the model of free-from diet adoption



3.2 Going on Autopilot – Back to Phase Zero

With consumers' stories, it was possible to tackle the process of changing one's diet as composed of three phases, characterized by three interlaced dimensions, plus a Phase Zero, describing the consumers' habits before that change (see Figure 3.1).

In particular, Phase Zero was described by consumers as “*living on autopilot.*” Before the change event and before free-from products became part of their eating habits, people followed a consolidated and stable diet in which food consumption was considered just as a way to sustain themselves without a particular plan or project around it. Their consumptions were characterized by stability and guided by pass knowledge, credence, or more by a “belly” emotional and hedonic preference. The consumers in this phase seemed not to have a food goal, but they reported to be more at the mercy of the context and the social environment. Food choices for them didn't represent a way to express their identity in terms of values, attitudes, and emotions. In some cases, for example, they delegated the food choice to others.

“But actually I did the shopping based on what I wanted to eat, I ate anything, really without making any kind of problems, probably because I was younger and my metabolism worked totally differently... I did the shopping more based on desires.”

(Woman, 2 years GF diet, tolerant)

“..I was much less inclined to change, I took foods that I knew, fast things, probably because in charge of the shopping there was someone else and then I ate what was there.”

(Man, 1 year LF diet, tolerant)

They therefore denoted certain stability in their consumption choices that reflected a solid and undisputed self-perception, sometimes defined as “*non-care*” or “*unconsciousness.*”

“I was a bit more unconscious consumer, I ate what was there, I didn't care much about the food spending.”

(Man, 3 years GF diet, tolerant)

“Before maybe I was a little less careful, less attentive to detail, without thinking of my future too much, and about the diet, I was a bit more superficial.”

(Man, 2 years LF diet, tolerant)

“I didn’t plan everything about my life, just what happened day after day, because I was a bit superficial, being younger you think that everything is possible, you don’t think of the consequences of your diet, you eat McDonald’s everyday and then you have cancer, or the same for smoking.”

(Woman, 1 year GF diet, tolerant)

“Before I didn’t even cook, now I cook myself, so I am more interested in the threshold of 20; I am no longer a young girl, then I was okay and I just thought that, that was okay for that moment, I felt well.”

(Woman, 4 years LF diet, tolerant)

3.3. Behind the Change: The Breaking Event

In a life oriented by consolidated food and lifestyle practices, suddenly something interrupted this balance, as a storm came into the consumers’ lives. This storm manifested itself as a *“perception of something changing in their lives,”* *“an alarm bell,”* a disrupting event or series of events interrogating them about their body and mind functioning. In greater detail, as participants stories transpire, it is possible to trace some peculiar events that affected the consumers both on a physical and a psychological level, limiting their daily activities, interrupting their consolidated routines, and finally interrogating their food trajectories and lifestyle projects. The events mentioned here were related to each personal story; for example, a pregnancy, moving into a new city, the loss of a loved one, the beginning of a new work/university experience, a disease, an injury, or a moment of psychological distress; these are not always directly attributable to one’s diet. Anyway, all of these events have in common the ability to interrupt people’s routines, as described below.

“I discovered I had gall bladder disease, they operated on me and removed my gall bladder and told me to eat healthier, while before I didn’t even cook.”

(Woman, 6 years GF diet, tolerant)

“I think it was the transition between adolescence and adulthood, in fact this diet started

when I was 18/19 and I started the university, so I became more independent and I matured.”

(Woman, 5 years GF diet, tolerant)

“Everything started when I was pregnant, I change the way of thinking about the food, and in general about my life”

(Woman, 9 years LF diet, tolerant)

“When I moved to Milan to start the University, it’s when I started to buy the food alone, before my mother was in charge of it, so I didn’t care about it.”

(Man, 4 years GF diet, tolerant)

“I had to try these foods years before, but I didn't succeed, I didn't care about it really, but after the accident, I had stopped for 2 months, stuck at home and I lost all the tonicity, kg by kg. Everyone said to me, look how thin you are, you're not well, you see you're thin, and that was an extra incentive.”

(Woman, 5 years GF diet, tolerant)

“The understanding that I accepted a condition for me that was not good, when I didn’t feel myself anymore, in the moment in which I understand that I wanted to change something. At that point is done, you start doing something.”

(Man, 2 years LF diet, tolerant)

Moreover, in this moment of particular sensitivity, consumers started to pay more attention to their body signals, and they reported some physical symptoms, mostly related to the gastrointestinal system, like abdomen swelling, widespread stomach pain, weight loss, bad digestion, headache, and rashes.

"Physically if I eat bad, I am also sick with stomachache, diarrhoea, those things, gastrointestinal problems. And if I eat badly for a few days together with stress and little sleep I get herpes, this is very disabling both psychologically and physically.”

(Woman, 3 years GF diet, tolerant)

“I was not feeling well in my intestines; I had a lot of problems with abdominal pain and often dysentery, and I could not understand what the cause could be”

(Man, 5 years LF diet, tolerant)

“...it (the change of diet) was mainly because I felt puffiness, I had stains on my face”

(Woman, 3 years GF diet, tolerant)

“I couldn't leave my home because I was always afraid pains would come, even I went away I couldn't take a walk or go to the beach if I ate something that I knew would be dangerous.”

(Woman, 4 years GF diet, tolerant)

“I went to nutritionists who confirmed to me that eliminating lactose from one’s diet only improves health.”

(Woman, 3 years LF diet, tolerant)

In this particular phase of their lives, consumers become more and more attentive to their bodies and to the physical symptoms they perceive. It emerges from the interview that the psychological distress they were experiencing brought them to be more exposed, to be more sensitive. As a consequence, they started to focus on their body that, from their perspective, *“didn’t function as before.”* Consumers describe these breaking events as something that in some ways invalidates their daily routines and brings them to focus on their daily performances and life projects that don’t appear the same anymore. Everything finally converges into a substantial activation, aimed at re-establishing the interrupted balance.

In this process, the food sphere became worthy of attention and more and more considerable. This area is indeed perceived as strongly connected with the body gastrointestinal symptoms that people experienced, and mentally people perceived their nutrition as the most direct and easy way to take charge of their perceived unbalanced condition. In pursuing this process of renovation, consumers look for easier, lighter, and simpler food. As discussed before, the breaking event indeed brought with it a series of consequences the consumers wanted to eliminate, and the adoption of a healthier and lighter diet was perceived as the most immediate solution.

“The change precisely started when I had come to a point in my life where I wanted to change physically, and I said, I don’t want to go back to that point anymore, when I felt so bad. So from there I started to pay attention to my body signals, before the focus was on weight but now it’s on feeling good, feeling light, also inside. For this reason, as I was saying, I avoid things that are too processed, I call them too messy. I’m looking for much simpler things.”

(Man, 6 years GF diet, tolerant)

“(After the critical event), I was psychologically in a more serene condition, this being more serene mentally led me to want health of the body, to eat lighter food, simply

prepared. I started to question that my habits were not healthy but I never did anything, before that moment. There was just the need to create a condition, to look for a better condition for my body, by eating something appropriate, which made me feel good. So my body could match the mental stability I have reached now."

(Woman, 5 years GF diet, tolerant)

"In that period it was as the body didn't respond as I wanted: I felt heavy, with a sense of oppression in my stomach. I wanted to find a solution to feel again better and so I started this diet (free from lactose), to pay attention to the food I ingested. I started to understand that what you eat is what you are, so the diet was the best way to turn back to feel like myself."

(Woman, 4 years LF diet, tolerant)

At this crossing point, when the consumers were looking for easy, light, simple foods, in some ways they entered in contact with the free-from food category. These products, with their intrinsic characteristics, appeared as a solution to the challenges the participants were facing. In the same label as "free-from" products, they elicit in the participants' representations something that could help them to come back to a more natural, clean, and simple way to eat. The consumers interviewed reported on their attitudes, and the representations towards these products were indisputably related to a healthy and natural diet.

"It is known that these products, free from lactose, are healthier than the normal ones. These are ingredients that could be removed because they aren't necessary."

(Man, 2 years LF diet, tolerant)

"I feel more secure for my health in the sense that if I buy a product that I know is gluten-free rather than made with whole wheat flour, I think that when I eat these products they won't give me problems, I'll feel lighter, they won't weigh me down, or rest on my stomach."

(Woman, 3 years GF diet, tolerant)

"I think that in part is about prevention, that a person can have the feeling of feeling better by avoiding eating certain products (gluten free), or the fact that by eating products that are now coming on the market you can have benefit for the health condition."

(Woman, 5 years GF diet, tolerant)

"I have never been lactose intolerant but in fact it makes me feel good not to drink it, as even not eating flour, even if I am not intolerant, it makes me feel better. Is something that you can rid of without any consequence for your health unless to feel better"

(Woman, 2 years GF diet, tolerant)

From consumers' narrations, it appears clear that these products were perceived in people's mind as enablers to regain possession of their previous condition. To eliminate these ingredients (perceived as useless for their diet, if not even unhealthy) allowed them to restore a new balance, perceived by the consumers. Other factors contribute to the building of this representation. With the increasing possibilities through which consumers can be informed today, the participants in this research reported that they felt overwhelmed by what they perceived from the news and the media. These consumers were in a period of their lives that was particularly sensitive, during which they were looking for new solutions to bring back a lost balance. In achieving this attitude, they were more receptive to information. They seemed to be guided by an evolutionary and natural boost to come back to their psychophysical situation, and in pursuing this aim, they were more open (and vulnerable, in some ways) to the information that best could confirm their ideas.

"There have been a number of factors, even just the whole palm oil boom, which actually is dangerous or not, I don't know, maybe hurts the planet more than us... but it lets you think to come back to a more basic diet."

(Man, 2 years LF diet, tolerant)

"I think all the advertisements that are all spread by the big brands that we all buy, that make you change your diet because they tell you things... but the reality is that people don't ask why they basically believe that, people just think that it is better for them so they buy it."

(Woman, 2 years LF diet, intolerant)

"For sure we are more exposed to the information, and among all the news you can find the one that is better for your condition."

(Woman, 8 months GF diet, tolerant)

Another guide factor could be the suggestion of a friend, a trusted person, or a health professional. Also in this case, the suggestion of these people arrives in a moment of consumers' particular receptivity and willingness to find a solution

for their condition, which could confirm and reassure them in their attempt to come back to a more natural and simple diet.

"The information that was emerging also from TV rather than from magazines on these products (free from lactose) played a big role. I have also read some interviews on social media, on Facebook, rather than on the Internet, and our regime has changed a little in our behaviours."

(Man, 1 years LF diet, tolerant)

"One of my dearest friends became vegan, so he started to tell me things about the importance of our food choices, so I began to interrogate myself too."

(Woman, 2 years GF diet, tolerant)

"My mother used to buy these products for many years, and in that period I said, why not? Maybe her diet is better also for me. She suggested to get rid of these products (gluten free) to feel better and so I did."

(Woman, 1 year GF diet, tolerant)

These consumers' stories make apparent that the relevance of free-from foods, which until the breaking event appeared at the same level as others, was invested by the power to immediately fill the gap between their actual condition (after the breaking event) and the condition they want to achieve (a renewed balance). The perceived connection between the psychological and the physical distress is crucial, which emerges from the narrations and to which consumers try to find interpretation, focusing more and more on the role of nutrition. Nutrition connects peoples' internal and external self-representation, and the food we decide to eat is the mirror of where to see whether these two spheres match together or not. Moreover, being active decision makers in their diets allows consumers to feel empowered to start the process of change aimed at re-establishing a balance. With an increasing investigation into their behaviours, moreover, consumers find among the variety of food available the free-from-gluten and -lactose foods, which intrinsically are represented by consumers as "clean, simple, healthy, easy." These are the characteristics people were looking for to start to build new food trajectories. It seems that people even express the need

to “come back to basics” in order to start again with their lives. By eliminating the ingredient, the guilty party, it would be possible to find the balance they feel to have lost during the breaking event. In this process, both the external information perceived and the suggestion of the close social environment function as a containment and support network. In this case, people try to find reassurance of their choices, and in doing so, they look for confirmation. This belongs to the basic human psychological mechanism of looking for something that can confirm our attitudes, projects, and ideas rather than disconfirming them, because it needs less cognitive and emotional effort (Ajzen, 2001; Van Dijk, van Kleef, Owen, & Frewer, 2012). In different ways, finally, these foods serve the function of facilitating new food patterns and life projects. In doing so, through their consumption, they started a process of reconstruction of their food practices, and through them, a reconstruction of their new perceived balance. In particular, three main phases can be delineated to describe this process, all characterized by evolving DNA as an intersection of the three different dimensions previously described (see Paragraph 3.1).

3.4 Experimenting through Trial and Error – Phase One

In the first phase, the consumers interviewed reported initial disorientation related to the fact that they were experimenting with new food consumption, free-from gluten or lactose. While introducing this new food, inevitably they introduced some element of disruption from the past. Starting from the first dimension, they faced new information, and the knowledge they have always been relied on could now not be sufficient anymore. They needed to rebuild new cognitive categories related to the nutritional aspects of these foods, but also related to how to cook and eat them. In some ways, the participants seemed to speak a new language, made of new ingredients and nutritional facts, but giving the idea not to be totally aware of them. In other words, they seem just to reproduce the

information reported on a product label, but not understand in depth the other related aspects.

"The verification that I do is only about the nutritional component, from a label. I know how many calories a woman needs, but I never got too informed, I don't feel like understanding enough about this world."

(Woman, 1 year GF diet, tolerant)

"Initially a bit traumatic, for example going out became a difficulty, an impediment, and it is not easy to avoid products with gluten, especially here, even if the places where they use gluten-free foods are increasing more and more. But of course fried foods, crumbed things are not so easy to adapt, and it is not even easy to have in mind all those foods in which there may be this ingredient."

(Woman, 8 months GF diet, tolerant)

"I tend to buy a product where I can more or less understand how it is if the box is all white with no information, I don't buy it, if the packaging it's not transparent and it gives me little information on what I can find inside, I don't buy it"

(Woman, 2 years GF diet, tolerant)

For this reason, in the first instance, the consumers report buying what the author has defined "bridge products," that means products that were similar to the old ones, but without the ingredients they decided to eliminate.

"I try to take things that I used to eat before, for example, plum cake for breakfast, and make gluten-free plum-cake, I tend to take them because I know that it is similar to the normal."

(Woman, 1 year GF diet, tolerant)

"I tried different alternatives, I started my own classic gluten-free pasta and then I also tried different stuff, like gluten-free legumes, but I started from classic gluten-free pasta."

(Woman, 2 years GF diet, tolerant)

"We have replaced some foods that we used to consider 'normal' with lactose-free foods; for milk now we take Zymil, the yoghurt we take the Greek one, and also for the ricotta cheese we take the one without lactose."

(Man, 2 years LF diet, tolerant)

These products allow consumers to experiment with new diet assets, but not radically, remaining thus anchored to something familiar for them. More specifically, consumers find in the known brand a sort of emotional reassurance

in their choice. The brand indeed speaks on a more immediate and direct level, using colours, symbols, and images to tell stories and express emotions to which the consumers can directly connect. In this phase of disorientation, when the consumers don't want to manage enough information to make a proper choice, the language expressed by the brand could be a warm place in which to find something familiar to them. It must be noted, moreover, that these products (bread, pasta, milk, and dairy products) are considered pillars of the Mediterranean diet, so from a cultural aspect, they remain in some ways essential for the Italian consumers interviewed. A radical abandon of them would be not sustainable in this first phase, because it requires a change in the cultural assets already established and rooted in their diets. In doing so, the interviewed abdicated the centrality of food choice to the brand, which becomes a facilitator of the decision-making process.

"I have experimented with different brands and products. Usually I buy the famous brand as "Le Veneziane," which is the first type of gluten-free pasta I tried, which turned out to be the best, because when I eat that kind of gluten-free pasta it reminds me of the normal pasta."

(Woman, 4 years GF diet, tolerant)

"Before... I didn't really care about the brand or in any case the product itself, because in any case they all seemed the same to me. Now instead, I have become attached to that brand, I let myself be guided by the famous brand to choose."

(Woman, 2 years GF diet, tolerant)

"I prefer a brand already known in the sense that I still can trust it."

(Man, 5 years LF diet, tolerant)

It appears clear, as in a moment of temporary disorientation, a more immediate element could be a guide for these consumers and could do what they aren't prepared to do yet. Consumers decide through mental heuristics, which are cognitive shortcuts that facilitate them in their decisions (Schulte-Mecklenbeck, Sohn, de Bellis, Martin, & Hertwig, 2013). This could include, for example, buying familiar brands because the known brand name is a signal for product quality and

trust, and at the beginning of this process, consumers don't know yet about the new ones. In a new diet orientation, finding shortcuts through the emotional reassurance of a familiar brand could help them to face the uncertainty related to the informational sphere.

Finally, considering their behaviours, consumers reported that, as they proceed in the new diet, they practice by trial and error, experimenting with one product after the other, mostly guided by taste, which again plays the role of emotional reassurance. Their diet regimen is in a phase of experimentation, so the consumers introduce these products in already consolidated practices in order not to feel lost.

“I try different things, and then when I stop on a product it is because there is almost no difference in the taste between the one with lactose and the one without.”

(Man, 6 years LF diet, tolerant)

“We tried soy or rice milk, but we don't like them because they don't taste like milk, so it is difficult to find the product that you like.”

(Woman, 2 years LF diet, tolerant)

3.5 Renovating New Trajectories – Phase Two

In this second phase, free-from gluten and lactose consumption becomes increasingly part of consumers' diets. The products start to become more habitual, as they reported better general management of this new regimen. In particular, from an informational point of view, people reported feeling in a process of “*building a new vocabulary*” related to these foods and their characteristics. They try to find accurate and pertinent information, even if the infinite availability of sources makes it difficult to overcome some of the main barriers. They are increasingly more informed, but in this phase of their experiences, they don't have the necessary skills to manage this information in terms of how to select and elaborate on it for their specific case. Their representation is that these foods

could contribute to their health, but they still don't know how to approach them in a more balanced way.

“Actually I have some information about gluten on what is wrong, I have to learn what celiac disease is, and I'm not celiac, but I don't know many other things relate. Sometimes I feel overwhelmed by this information, don't know what to do exactly.”

(Man, 1 year GF diet, tolerant)

“Using bread substitutes has diminished my headaches, and as I saw that I suffer less, I made myself gain a sort of food education and now the thing is continuing, I read some books.”

(Woman, 2 years GF diet, tolerant)

“I needed to know everything about this world, so I started from the bottom, and now that I a little bit more informed I need to manage new information.”

(Woman, 6 years LF diet, tolerant)

As a consequence, in this moment, consumers appear more vulnerable to unreliable information. In broadening their knowledge to include this new information and in starting to build some personal credence about them, the risk indeed is to fall into incorrect sources of information that populate the Web or to be victims of the social influence dynamics. The Internet appears from these interviews to be the most used source, but the diffusion of accessibility and the difficulty to go back to the origin makes it a possible trap.

“I use almost exclusively the Internet, or books, also because the TV says things that belongs to 10 years ago... like eating a portion of fruit or vegetables, so the TV is very far back, I use the Internet or dedicated books to collect information.”

(Woman, 5 years GF diet, tolerant)

“I am careful to check that the source is true and then an important thing, I always go to check on other sources because on so many things, there are a little bit of conflicting opinions related to many topics on nutrition, it may be confusing.”

(Man, 6 years LF diet, tolerant)

“Everything I read on the Internet I take with pliers, because you never know. So many people who are not sufficiently informed think they know and propose absurd things that are neither in heaven nor on earth, but I know that many people are more vulnerable to this, so the risk is to believe everything.”

(Woman, 6 years LF diet, tolerant)

“I started looking for information about gluten-free products, but it was not easy because the Web is full of information but not always true or scientific.”
(Woman, 2 years GF diet, tolerant)

“People today are extremely influenced by social media, so as soon as they see something truthful, they tend to be very influenced. Clearly the person who influences you must be trustworthy, it’s not that every time I see information about a product I trust it.”
(Man, 2 years LF diet, tolerant)

“Let’s say that, at the beginning, I was very influenced by advertising/presentation of the product after I started to study everything a little better and I went a little bit of my own way, considering if I like the one or the other.”
(Woman, 5 years GF diet, tolerant)

“I am registered on Facebook with different lactose intolerance groups, and those people are there and listening to these people have directed me a bit to tell them these products.”
(Man, 1 years LF diet, tolerant)

In trying to extricate truth from all the information, though, participants evolve also in the behavioural dimension. They reported that the purchases become more regular as the diet management becomes increasingly easier. They moreover report that they started to personalize their diet, although there are some occasions when it becomes difficult to “*follow this new rule*”. These are occasions when people are with others or find themselves in an unusual situation (like vacancy or out of their home). Their newly renovated routine is put under pressure by factors, and they fear losing control of their behaviours.

“At the beginning it was not easy to follow the diet, because of course when you go out with friends to eat pizza, you cannot say no.”
(Man, 1 year GF diet, tolerant)

“Sometimes it happens to me to fail, to follow this diet is not easy, you have to give up your habits, also because in my family I’m the only one to follow a lactose-free diet, so I have to eat differently, my parents don’t understand, and it is not easy at all.”
(Man, 1 years LF diet, tolerant)

This appears also related to the fact that, in this phase of renovation, those interviewed still perceived these new diets as something not completed elaborated from more a emotional level. Consumers still don’t perceive a stable relation with the emotions experienced in relation to food choice. In particular, they alternate

up and down emotions: negative related to the sense of guilt and worry when they aren't able to succeed in their diet, and positive when they succeed and feel satisfied and rewarded.

This is an area in which they are starting to invest part of their lifestyle plans, although they are working to reach a better physical and psychological balance in this regard. After a period of what they call “*deprivation*,” they re-establish an emotional relation with the food, and the free-from foods in particular give them the illusion to feel more confident and safe in the building of a new lifestyle projected.

“But you have found a good substitute in goat's milk, in sheep's milk, the more seasoned cheese so do the same thing that cow's milk does.”

(Woman, 6 years LF diet, tolerant)

“(With these foods) my life goes on quite the same. Before it was easier, but now even if there is this problem, I am confident with my choice.”

(Woman, 4 years GF diet, tolerant)

“After this period of deprivation, now emotionally I did not perceive it as a very difficult phase, but I had to adjust based on the symptoms I was experiencing. In reality I never deepened it from a diagnostic point of view, because I noticed that I was able to manage it anyway.”

(Woman, 3 years GF diet, tolerant)

3.6 Finding a Perceived Balance – Phase Three

In the last phase, the interviewed seem to have renewed a nutrition routine surrounding free-from choices. This is because, relative to the informational dimension, they perceive to have built a broader vocabulary and to be re-appropriated with certain self-confidence in the use of the information related to these foods. Moreover, the people interviewed expressed feeling capable of discerning useful information for their own needs. However, consumers still experience perplexities and trouble navigating the vast amount of information available, both from the Internet and the network of relevant people.

"I'm careful looking at if the source is truthful, and then an important thing, I always check on other sources because there are a little bit of conflicting opinions related to so many topics on free-from-lactose foods, so the important thing is that you may find the information that better fits your case."

(Woman, 6 years LF diet, tolerant)

"There are things that are also true and that are often taken for granted by people without reasoning about, so it is important to make your own reasoning about the food you buy."

(Woman, 6 years GF diet, tolerant)

"I work in the hospital and therefore I am also quite used to following rules, not strictly, but just considering the importance of information about the nutrients in my broader diet. So I try to have a very varied diet, certainly the healthiest possible, so I must say that in the expense I prefer whole grain products, or free from lactose... I try to take the information that makes me feel good."

(Woman, 8 years LF diet, tolerant)

"Now I stop more perhaps to read what is written on the box, because the information is not standard, as these products are a little more particular. When I see a new thing that I do have never seen, I pause to read what it consists of... what's really inside."

(Man, 5 years LF diet, tolerant)

This reflects and is reflected also in the behaviours these consumers put into practice. In particular, consumers started to come in stronger contact with the food itself, finding for example enjoyment in discovering new recipes to cook their free-from foods.

"I have less time but I want to spend time preparing food. I often eat avocado cut into small pieces and a bit of gluten free corn cakes with zucchini, fast things. I don't do delicacies, I never have time, but even if I eat fast in 10 minutes I ate healthy"

(Woman, 4 years GF diet, tolerant)

"As a choice, I started making my own gluten-free bread and cooking things; it becomes a pleasure both because of the taste and to feel pride in yourself."

(Woman, 6 years GF diet, tolerant)

Moreover, the participants perceived that their regimen became introjected. For consumers, the most important judge in this phase is the body itself, to which they rely their choice about how to orient the diet.

"I try to stay in line and so the moment I break I don't feel so guilty because I know I was good anyway and then I can get back in line. I will be more careful next week, I can accompany things better, but yes I sometimes go out of the rule."

(Man, 6 years LF diet, tolerant)

"I do not spend the week to eat badly, I eat well all week, and then if it happens, I do not make problems."

(Woman, 4 years GF diet, tolerant)

This sense of confidence arises because the free-from diet became a new habit, bringing with it a series of related behaviours. Many times, this lifestyle is related to a more active life, through the introduction of a new sport or beauty routines that allowed the consumers to take this time for themselves.

"Definitely yes, in fact if I see the change I made in terms of nutrition I also have a change a little wider than the lifestyle. I have always had a semi-sedentary lifestyle, in the last 2/3 years I am more interested also from this point of view. I go to the gym, I go to it fairly assiduously. For me it was not an important thing before, but now it plays a fundamental role."

(Woman, 4 years GF diet, tolerant)

"I didn't care much about physical activity, I saw myself beautiful regardless, now I also do gymnastics, I buy skin creams, I try to buy good hair products."

(Woman, 8 months GF diet, tolerant)

The change in diet after a breaking event, as described at the beginning, was an occasion for these consumers to take the reins of their life by starting doing something for themselves that made them feel realized and satisfied, through what they perceive to be a healthier lifestyle, as is allowed them to eliminate their condition of physical and psychological instability.

Finally, people stated that this perceived balance became possible because of the role that their new food choices brought to their life. From the necessity to be guided, which characterized the first phase in which these consumers focused on taste as an emotional reassurance, to the centrality of these food choices in their life is described in this last phase. These food were indeed invested by the "salvific power" to bring back people to their lost balance.

“The basic thing in my opinion is that you have to work head on, if you are not aware of what you want, it is difficult to head to the gym and test the power made me move forward, having achieved my goals I went ahead... now all this... now it's routine for me... it's not because I need it, now it's like this is my life.”

(Woman, 6 years LF diet, tolerant)

Moreover, these foods became, in these consumers' representation and perception, a tool to help them pass through the period of change and to start to feel good again. The free-from choice is steeped in emotional involvement, being the centre of a new lifestyle project for the consumers.

“Having a healthy diet with these foods... I mean, if before the model was food to please, the model is now food to feel good... in short, the idea of eating well and at the same time being happy, before it was seen as a paradox, now it is possible.”

(Man, 6 years LF diet, tolerant)

“My attitude towards these free-from foods has shifted from being a purely emotional attitude to a conscious attitude. I now prefer these foods that just make me feel better to a richer taste that makes me sick, makes me feel sick.”

(Woman, 6 years GF diet, tolerant)

3.7 The Core Category: Looking for the (Perceived) Balance in food consumption

Grounded Theory methodology expects the researcher to detect the core category, which means to identify the most meaningful category that brings sense to all the psycho-social processes described. In this research, the author identified as core category “looking for balance”, which in this case the author also has connoted with the adjective “perceived”. This category indeed indicates a continuous research that the consumers undertook through the process, describing their change of diet to free-from food. The breaking event, described previously as a particularly salient event for the consumers, was perceived by consumers as a psychophysical impediment to their lives. In this period, these foods assumed for them salience in the way they were perceived by consumers as a solution to the critical situation. The promise of easy, clean, simple, basic foods that these

products carry, found in consumers' representation a fertile soil in which to start building new food patterns and lifestyle projects. In that key moment, the consumers seem to have lost the compass of their lives, because of the questions this event brought to the surface. It consists of a physical and psychological turnaround that interrogated participants' broader lifestyle trajectories and habits. This pushed them to look for the reconstruction of a balance, in which to realize a new way of being consumers, enabled by the free-from foods. Through this process, the consumers passed from a phase of initial experimentation in which the research of the balance was characterized by initial trial-and-error practises; to the second phase, in which the three dimensions – informative, behavioural, and emotional – contribute to the creation of new food practices; to the perceived balance, which means a new balance, different from the other, but still significant for them. This process could be expressed in terms of psychological elaboration, which allowed the consumers to perceived the free-from diet regimen as the only way through which re-gain back their power in their lifestyle projects. These foods were indeed projected with consumers' expectations, as they felt completely involved (and probably absorbed) by this new world.

"I believe that if you do not analyse yourself and do not listen to your body, you will never take this step, this change, because the body gives you signals anyway. I had hair of another colour, bad and frequent stomachache, I felt heavy and I could go on like this without thinking about it and taking pills. But then I realized that I had to listen to myself and I probably also to the mental level to be more satisfied."

(Woman, 6 years LF diet, tolerant)

"The fact that there is precisely an attitude that, to be more and more aware, you have to abandon your grandparents' knowledge to feel better, this is due to a tendency of the man of evolution. I think this evolution starts from yourself."

(Man, 5 years LF diet, tolerant)

3.8 The Experience of Intolerant Consumers

The comparison with intolerants' interviews gave consistency in some ways of the psychological process of "looking for balance" experienced by the tolerant consumers; however, in this research framework, no data saturation was pursued in relation to these consumers. The turn to free-from diets was perceived by these subjects as a totalizing experience, which involved not only the food regimen, but also the broader lifestyle; not only their habits, but also their family's ones.

"When I had the diagnosis, I was shocked.... this change is really important, you feel so overwhelmed and disoriented"
(Man, 4 years GF diet, intolerant)

"When you change to free from gluten, all the people live with you inevitably feel the change with you"
(Woman, 2 years GF diet, intolerant)

The sudden food restriction was perceived as disabling for them, in some ways similar to what tolerant consumers perceived in the breaking event. All the food plans were involved by this change, which brought consumers to build new ones in order to feel again coherent and balanced with them.

"I had to do a deep work with myself in order to accept the disease, to feel again me, to feel ok with all the restrictions arrived with it"
(Woman, 2 years GF diet, intolerant)

"When I was diagnosed, everything changed, all my habits, everything...I needed to learn again and to give me some new rules. Also my social life changed a lot."
(Woman, 2 years GF diet, intolerant)

Even if different in their starting point (as the tolerant consumers' turn was voluntary, contrarily to what happen to the ones who had an intolerance diagnosis) these experiences have in common the deep psychological process that accompanied these individuals to re-built food plans after the change event. In

this interpretation it could be glimpsed as the roots of this psychological process are deep into people's lives. For intolerant people, the diet change is totalizing, and in some ways this is also what happen to tolerant consumers. They build around their change to free-from diet an entire lifestyle so as the “perceived balance” they acquire.

4. Discussion and Conclusion

This study examined in depth the process underlying the choice to turn to a free-from gluten and lactose diet among tolerant consumers. This specific target was chosen in order to answer some of the questions proposed in Chapter 1 (see Paragraph 4). Moreover, due to the qualitative nature of the method used, the study allowed for a deep exploration of tolerant consumers' direct experiences, collecting and analysing their own stories and filling some gaps in the literature. Finally, the psychological perspective contributes richness to the data by exploring them through the deepest individual mechanisms of self-elaboration involved, thus bringing sense to the complexity of this phenomenon.

From the interviews, it was possible to track an experience-based model reproducing the psychological process through which consumers shift their diet toward gluten- and lactose-free products. The process has been described in 4 phases. The model began with a preliminary phase, which has been conceptualized as *Phase Zero*, describing consumers' routines before their dietary change. This routine was interrupted by a *breaking event*, an event that hit the consumers on both a physical and psychological dimension and triggered in them the need to re-found a new balance, which was interpreted by the author as “perceived”. This event became the trigger for free-from food consumption. Then, the author traced three more phases: the *Experimentation*, a moment in consumers' experiences when they discovered new food practiced through trial

and error; *the Renovation*, when these food practices became more and more consolidated; and *Perceived Balance*, when consumers finally found a new balance. Free-from food consumption was the enabler through which the participants regained the perception of a balance, thus experimenting around it new lifestyle projects.

In line with the past literature, it is possible to find some contributions exploring the role of what the author has been called “breaking events.” In particular, some authors have described them using a number of different terms, including epiphanies (Epiphaniou & Ogden, 2010), medical triggers (Gorin, Phelan, Hill, & Wing, 2004), teachable moments (Lawson & Flocke, 2009; Marks & Ogden, 2017), and life crises (Miller, 2004). In their work, Lawson and Flocke (2009) perform a review of the different conceptualizations of teachable moments, discussing how this concept remains largely untested and under-theorized. They identify three main areas in which it possible to conceptualize this moment as a specific event or context, as an unpredictable opportunity or based on the impact of this moment on the behavioural change (Lawson & Flocke, 2009). Other authors have focused on the role of the medical trigger in contributing to better short- and long-term change in diet maintenance for obese people who have lost weight (Gorin et al., 2004). On the other side, in the field of food intolerance, moreover, Marks and Odgen (2016) found no significant reduction in weight or food intolerance symptoms related to a significant event.

Despite the role of those life-involving events shows no univocal results in impacting on a change, the author focuses here on the fact that, generally, in the area of food consumption, these events are used when people have to change or have changed their behaviours because of medical issues or to increase a better health condition, such in the case of vegetable or fruit intake in children (Papaioannou et al., 2013). In the case discussed here, instead, this breaking event appears to be as something literally “breaking,” “interrupting,” or “disrupting” the individual psychological balance, both on an internal and an external level,

thus bringing them to re-negotiate with themselves their own lifestyle projects. These results echo in some aspects the scientific debate around the psychosomatic theories related to eating patterns (Konttinen, Männistö, Sarlio-Lähteenkorva, Silventoinen, & Haukkala, 2010; Norwood et al., 2019). In particular, if considered in the broader frame of psychosomatic theories, the breaking event that started the process of changing one's diet to free-from could be intended as a distress to ego integrity (Jones, O'Connor, Conner, McMillan, & Ferguson, 2007; O'Connor, Jones, Conner, McMillan, & Ferguson, 2008). These situations, indeed, are described as having the potential to produce negative feelings or challenges to bring awareness of success in a life plan or failure in a life project (Wallis & Hetherington, 2004). Despite the lack of evidence of a direct relation of these psychosomatic dimensions and free-from food consumption in tolerant consumers, it can be discussed as in some ways, the breaking effect analysed here appears to affect an intimate dimension of consumers' self-perception and sense of worthiness. For this reason, consumers could approach such consumption as a way to put their situation back in balance. Moreover, as reported in Chapter 2, it is possible to discuss the free from consumption also in the light of those studies described by Bratman (2001) about the concept of Orthorexia Nervosa. From the interviews, indeed, consumers reported a sense of purity, simplicity, cleanliness in relation to these products, all aspects well described by all researchers who, from Bratman onwards, have dealt with the issue of orthorexia (Dunn & Bratman, 2016). These authors, in particular, discuss the cultural, ideological and value component that underlies the initially harmless and naive attention to healthy food and that can potentially turn into a real eating disorder (Greenhalgh & Wessely, 2004). Most of the behaviors that are described in this chapter, in fact, appear similar to those undertaken by the "innocent orthorexics" (Bratman, 2017). These individuals engage in food regimes very different from those of their culinary traditions (see the case of milk and pasta in Italy) without manifesting a real disturbance, but by giving these foods the "salvific" value in the search for

balance and harmony. Discussing the results proposed in this framework could offer some interesting insights into the direction of a rooted psychological dimension underlining this new food consumption model analysed. This interpretation, however, needs particular attention in the modern context, in which the concept of healthiness is broad and cannot always be framed into precise boundaries (Bratman, 2017) or be adapted for everyone indiscriminately, as for the case of free-from diets.

Still on a psychological dimension can also be described the DNA process found to be at the basis of the 4 phases of dietary change. Specifically, the author discovered that these variables represent three main spheres at the basis of consumer understanding. In particular, the first one is related to the food and nutrition information. The interviews shed light on two underlined aspects related to this area: one describing the cognitive processes of information acquisition and elaboration, and another related to the interpretation and management of this knowledge acquired, in other words to the role of the social and contextual influence in determining consumers' informative background. As the consumers interviewed faced an initial moment of disorientation after the breaking event, they needed to re-create new nutritional and food categories. In doing so, the social context appeared as a frame of reference for them, thus influencing their consumption processes. These results are in line with a critical and integrated conceptualization of nutrition and food literacy, offered by some authors who reflect on the strong connection of food literacy with other human spheres on the personal, interpersonal, and societal levels (Truman, Lane, & Elliott, 2017; Velardo, 2015). These authors assert not only can health, nutritional, and food literacy be considered as three facets of the same concept, but that we must also consider the broader context as scaffolding for choices related to food. From this perspective, it would be possible to consider the important role of information and literacy in orienting food and dietary changes (Sykes, Wills, Rowlands, & Popple, 2013; Worsley, 2002). The second dimension is represented by behavioural

dynamics, which refers to consumers' increasing capability to have a leading role in the management of their diets. Related to this aspect, more research can be found that investigates the importance of diet management in specific conditions, such as celiac disease (Schilling, Yohannessen, & Araya, 2018; Villafuerte-Galvez et al., 2015) or obesity (Tremblay & Lachance, 2017). The proactivity and the increasing leadership appropriation have been studied, moreover, in other field related to chronic disease management (Eaton, Roberts, & Turner, 2015), but still this interpretation applied to the volunteer diet behaviours change appears to be novel. Finally, the third emotional dimension, which refers to how the consumer can emotionally elaborate on food consumption as something relevant to their self-expression. As seen during the discussion, as this psychological process of dietary change appears as a consequence of a breaking and stressful event, the emotional level also needs to be adjusted by the consumers in perceive the new balance. Also in this dimension, it is possible to find in the literature contributions focused on the role of negative or positive emotions on directing food consumption (Köster & Mojet, 2018; Köster & Mojet, 2015).

As previously discussed, in the past literature, authors referred to these three dimensions separately or in combination, but did not consider them as a whole dimension, with three main interconnected levers, as seems to be supported by those interviewed in this study. The theoretical progression that this study wants to bring is related to the fact that, from the narratives collected, it was clear that the process of dietary change was built upon the joint development of these three dimensions. The dynamic and multi-dimensional nature of this process was related to the multiple variables involved; consumers' cognitive, behavioural, and emotional spheres contribute to the development of consumers' capability to zoom in into the breaking event and to find in the free-from products – at least on a representational and perceived level - an enabler for renewed lifestyle projects. This process is made possible by the fact that the consumers' identities are deeply involved in the sudden change that the breaking event brought with it,

a situation in which they try to find new forms and meanings in the adherence to the gluten-free diet, even if it doesn't mean always to undertake the most appropriate food choice from a nutritional perspective.

Moreover, in this study, the author identified two main turning points through which to explain how the free-from foods contribute to this “looking for a perceived balance” process. In particular, the first one is related to the consumers' capability to find in the food product – free-from in this case – an interpretation key through which they can relocate their lost balance. If the food can assume this role, it means that consumers can start gaining back the perception of certain self-confidence in their food literacy and diet management, overcoming the first phase and moving to the second. The second point appears between the second and the third phases, and it represents a further step in the progressive consumers' re-appropriation of balance, where on the representational level the free-from foods can acquire the role of enabler of broader lifestyle projects.

In a recent publication by Kwasnicka and colleagues (2019) underlined the importance of considering the broader lifestyle in diet management for overweight people. In line with these contributions, we support the thesis that basing on the aspects of a broader lifestyle reconfiguration appears to be a way through which these consumers perceive to find a new balance.

These results can be finally discussed in the light of intolerant consumers' perspectives, used as critical case in this research. In particular, it is possible to notice, as this aspect of lifestyle change was perceived as disabling for who needed to adopt this diet for medical reasons. The process was described as long and complex, involving also people around them, forcing them to adopt a new diet for practical aspects (cooking just one meal per family). It is possible to discuss that, because of the profound nature of this change in consumers' lives (as a will for tolerants and a constriction for intolerants), the change to free-from diet appear relevant for them in expressing their values and new psychological

asset. Finally, as emerged from the literature review, also in this research price and taste were perceived as barriers for intolerant consumers (Szucs et al., 2019; Sálková and Hosková, 2016; Do Nascimento, 2014), but not for the sample of tolerant consumers here involved in the research. Also this final result can be considered in the discussion undertaken here in relation to the nature of the psychological process leading to dietary change.

This work highlights that consumers seem to use free-from foods as a key to finding balance that they perceive they have lost after the breaking event. In their representation and conceptualization of free-from products, these foods appear to satisfy this need. During the process described, the consumers increasingly attribute their renewed balance to these foods, and from it they start again to build lifestyle plans. However, a critical perspective on food consumption allows the author to discuss one of its strengths also as a risk of this process: the psychological elaboration. The psychological elaboration, and the increasing consumers' zoom in their inner dynamics, allow them to focus on themselves in order to return to meaningful food and lifestyle projects, facilitated by the free-from foods. The same psychological and well-rooted elaboration of the free-from foods, however, risks becoming a trap leading to possible nutrition biases, and an excessively focused and restricted choice could appear limiting. The ultimate risk is that these consumers choose to focus on a particular aspect of food choice of promising health, thus shifting the focus away from a proper varied and balanced diet.

In summary, this study built an evidence-based model of change of tolerant individuals to free-from gluten and lactose food consumption by highlighting its dynamic and multi-componential nature. The model is composed of four phases and the main levers of this change have been detected in the psychological process resultant from the conjoined action of the behavioural, emotional, and cognitive dimensions. The current agricultural, social, and environmental scenario

calls for new ways to educate consumers about more sustainable and adequate food practices. In this direction, even if the implications of these results are discussed from a critical perspective in relation to the food intolerance complexities and challenges, the study of this phenomenon could provide some insight to help understand what the key levers under consumers' change and to use them for educational programs. However, this study has some limitations that are here discussed. First of all, the sampling was implemented following a snowball strategy, which is a convenience sampling method typically used in qualitative research. This method is applied when the research target is difficult to access, as in the case of this research. In this method, the existing study subjects recruit future subjects among their acquaintances (Naderifar, Goli & Ghaljaie, 2017). A limitation is that could be difficult to find a substantial number of subjects for all the relevant variables. In particular, in this research, in the attempt to give reason of the dynamicity of the consumption process, the author decided to divide the participants based on different time span from when they decided to change their diet, and their age. However, the group of more mature consumers (36 years and over) was less substantial, so the author arranged to include all these participants in the same age class. This was a convenience choice; however, the author is aware of the possible risks involved in it and suggests future research to better focus on this target. Another limit here highlighted is related to the data analysis and interpretation. In particular, the author wants here to critically discuss the proposed interpretation of the so-called "*breaking event*". As discussed along the chapter, the label proposed for this variable that emerged from consumers' stories should be considered more as a series of events and/or conditions that the participants expressed in relation to the moment they turned to free-from diet and which the author tried to group and interpret as part of a process leading to a disruptive change in people's lives. For these reasons, the author opted for a label that was able to express this concept. Moreover, it has to be considered that the participants to this research were invited to focus

particularly on this moment from the interview's guide, with the aim to examine in depth the temporal scan of events leading to the final decision to change their diets.

Finally, this study still leaves some questions unanswered, related to the verification of the role of the variables conceptualized within this work.

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CHAPTER 4

PSYCHOLOGICAL PORTRAIT OF “FREE-FROM” CONSUMERS: INSIGHTS FROM A QUANTITATIVE EXPLORATION OF THE ITALIAN CONTEXT

Abstract

As described in Chapter 1, the turn to gluten- and lactose-free diets affects different populations worldwide with growing popularity in the last few years. In the Italian context, in particular, this phenomenon is changing some of the relevant economic and societal assets, and it is bringing about cultural changes. Moreover, as in other countries, the adoption of a restrictive diet risks having negative consequences for the maintenance of health. If these structural indications are clear, nevertheless the motivations behind these dietary changes in tolerant consumers appear unclear. In particular, the literature about tolerant consumers has focused more on products' characteristics, ignoring individual psychological predispositions, as highlighted in the first study (Chapter 2). To fill this gap, the author undertook a qualitative study in order to map the processes that brought tolerant people to voluntarily turn their diet to gluten- and lactose-free foods (Chapter 3). The results highlighted that the change is characterized by multiple components of a consumers' activation (behavioral, cognitive, and emotional), triggered by a meaningful “breaking event,” which has allowed these consumers to perceive again a sort of balance in their dietary and lifestyle projects enabled by the consumption of “free-from” foods. Given these results, the aim of this last study is to measure the phenomenon of lactose- and gluten-free diets from the point of view of consumption in the Italian population and to explore the relation among the variables identified in the previous studies. In doing so, proposed here is a cross-sectional study of a representative sample of 1004 Italian consumers that tries to bring to the surface a preliminary psychological portrait of “free-from consumers”.

1. Introduction

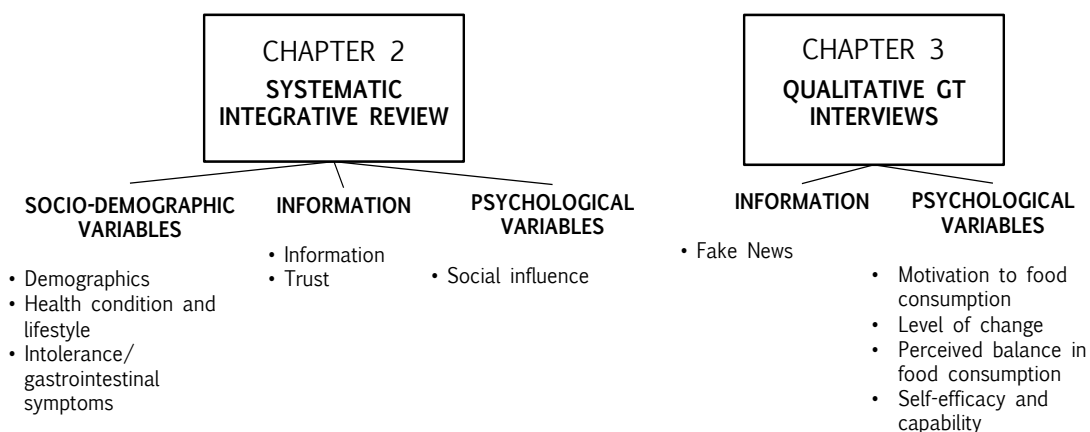
As reported in Chapter 1, in the last few years Italy has been experimenting with some challenges related to food consumption. In particular, dairy products as well as bread and pasta consumption are going through a period of crisis brought about by —among the other aspects— consumers’ choices of lactose- and gluten-free products. The data suggests, indeed, that more and more people are turning away from what was considered a traditional diet. Bread and milk are going through a crisis in consumption, as seen in the market trends (see Chapter 1, Paragraph 3); at the same time, new foods are filling consumers’ carts. More than 13% of the products in the Italian supermarkets have the label “free from gluten or lactose” with a turnover that exceeded 3.4 billion euros in 2018 (Osservatorio Immagino, 2019). Even if in the last year this food trend registered a slight decrease, 1.7%, in 2018 in the face of a 4.4% increase in 2017, these products are nevertheless well-rooted in Italians’ food shopping habits. However, if some of these trends answer to the need for adopting healthier diets and are recognized as an opportunity to face some global challenges, in some cases they can be perceived as far from the traditional and cultural way of taking in food in a country like Italy, with consequences for its social and economic assets. The food industries are indeed suffering from consumers’ dietary changes, and the consumers themselves appear disoriented and risk undertaking nutritionally inadequate diets and poorer lifestyles (see Chapter 1). In previous chapters, what has been discussed is that the turn to a “free-from” diet hides a deep psychological process related to people’s life crisis, a psychological process that allows them to re-acquire what has been called “perceived balance” in food consumption (see Chapter 3, Paragraph 3.7), where “perceived” expresses exactly the controversial consequences potentially involved.

However, to date no studies on the Italian context have explored the phenomenon of gluten- and lactose-free consumption, and in particular in relation with psychological variables related to the change and the perception of balance, and how it characterizes consumers of “free-from” foods.

Given these contextual elements, the goal of this third study is to quantify the phenomenon of “free-from consumption” in the Italian context and to explore the role of psychological dimensions that emerged from the previous studies.

In particular, results from the first and second study allowed the author to identify relevant variables for the understanding of consumer behaviours in “free-from” diets, here used to define the study’s rationale and measures. The following Figure (Figure 4.1) represents a graphical summary of what has been discussed in previous chapters.

Figure 4.1 Scheme of the variables identified from previous studies



In the light of these results, the aims of this study are:

- to describe the consumption of gluten- and lactose-free foods in the Italian context in terms of the frequency, motivations, information, trust, and health and lifestyle behaviors;
- to explore the role of a perceived balance in food consumption, in relation to “free-from consumption” and to other psychological variables;
- to describe “free-from consumers” in terms of their psychological dimensions.

Due to the exploratory nature of this study and considering the lack of previous studies on this specific topic in the Italian population, no hypotheses were previously formulated. The author will comment in the discussion section on the results, highlighting areas of interest and areas that need further study, which may orient in a more structured manner future research.

The results will be so divided: first a description of “free-from” consumption in the Italian context will be reported; after results will be reported related to the use of the perceived balance in food consumption in describing the sub-sample of “free-from” consumers as well as in relation to other psychological variables.

2. Method

2.1 Procedures and Sample

To answer the research aims, the author opted for a cross-sectional study using a structured questionnaire. The research data were collected through a consumer panel provider. The questionnaire was published online on a survey platform and made accessible during the period from January to March 2019.

The survey was filled out by a representative sample of the Italian population, made up of 1004 subjects of which 497 are male and 407 are female, between the ages of 18 and 75 years ($M= 46$; $SD= 14.6$). The sex, age, profession, size of the center, and geographical area have been extracted by means of quota sampling (Moser, 1952). The demographic profile is presented in detail in the results paragraph, Table 1. This study has been performed in accordance with the Declaration of Helsinki and has been approved by an independent ethics committee of Università Cattolica del Sacro Cuore in Milan (CERPS). An electronic consent form preceded the questionnaire and contained an adequate information disclosure regarding the purpose of the study and researcher contact details. Moreover, participants were promised anonymity and were given the option of withdrawing at any time.

2.2 Study Rationale and Measures

The questionnaire was divided into different sections that were presented in fixed order, starting with electronic informed consent and followed by the collection of socio-demographic information. Moreover, ad hoc items on informational aspects, health status, and lifestyle were included. Finally, self-report scales were included in an attempt to detect any possible interaction between the consumption of lactose- and gluten-free foods and some individual psychological variables. Here follows in more detail a description of the measures used in this study.

- **Food Consumption frequency**, measured with the question, “In the last month, how frequently have you consumed the following foods...?” with answers ranging from one to five, where 1 = never and 5 = every day. Other studies have used the same question to assess the frequency of consumption (Chekima, Chekima, & Chekima, 2019). Gluten- and lactose-

free foods were considered. Descriptive analyses were run in order to evaluate the psychometric properties of the items (see Table 4.2).

- **Motivation toward food choice**, measured with the single-item Food Choice Questionnaire (FCQ) (Onwezen, Reinders, Verain, & Snoek, 2019), which is composed of 12 items derived from the revision of Steptoe and colleagues (1995) 36-item original FCQ. All items were assessed on seven-point Likert scales, ranging from 1 = not at all important to 7 = very important. An example of an item is “It is important to me that the food I eat on a typical day is healthy.” This scale allow to explore some of the key motivations to food consumption, covering a broad range of dimensions (health, taste, convenience, ethical concern, ...) emerged also in “free-from” consumption from the previous studies (see Figure 4.1).
- **Information, Fake News and trust in sources**, measured with ad hoc items. As the “free-from” diet is discussed for its controversial nutritional aspects and consumers’ choices, in the literature it is highlighted that the informational sphere and the credence given to fake news appear as a critical area for investigating the relation to the level of psychological elaboration of the dietary change (Szűcs et al., 2019; Zarkadas et al., 2006; see also Chapter 2, Paragraph 3.2.1). Moreover, the interviews highlighted as “free-from “consumers are aware of the role of information and that the nutrition field is today highly exposed to the risk of Fake News (see Chapter 3, Paragraph 3.1; Keselman, Smith, Murcko, & Kaufman, 2019). In particular, the following descriptive items were developed:
 - “In the last month, how frequently have you searched for information related to food?” with answers ranging from one to five, where 1 = never and 5 = always.

- “In the last month how often did you use the following information channels to document you about the food products you purchased?” (television, radio, web sites, social networks, magazines, newspapers, and scientific Papers) with answers ranging from one to five, where 1 = never and 5 = always.
- “How much do you trust these sources in relation to information on nutrition?” (doctors, family and friends, politicians, consumer advocacy associations) with answers ranging from one to five, where 1 = I do not trust at all and 5 = I trust a lot.
- “In the last year, did you happen to believe in a news/story read on the internet or on social networks that turned out to be fake news?” with answers ranging from one to five, where 1 = never, and 5 = always; or 6=I don’t use the internet.
- **Health and Lifestyle**, measured with ad hoc items investigating:
 - *Satisfaction with life, health, and consumption*, measured on a four-point scale, where 1 = not at all satisfied and 4 = very satisfied.
 - *Fitness level*, measured with an ad hoc index of four lifestyle dimensions: Weekly exercise (three options: 0-1 times, 2-3 times, 4 or more times); weekly breakfast (every day, not every day); daily fruit and vegetable intake (two or less; three or more); Smoking behaviors (yes/no) (Christoph et al., 2018; Hartmann et al., 2018).
 - Presence of a *professional diagnosis* of food intolerance (yes/no) with a specific question asking “From which professional has it been diagnosed?” (open answer).

Together with socio-demographic variables, also the health condition and the presence of intolerance emerged as key variables from the literature review and from consumers’ experiences (Christoph et al., 2018; Hartmann et al., 2018; see also Chapter 2, Paragraph 3.2.1). The interviewed

reported indeed how the impairments related to a poor health condition contributed to their decision to change diet (see Chapter 3, Paragraph 3.3).

- **Perceived Balance in Food Consumption** (PB-in Food), measured with three ad hoc items created from the qualitative results (see Chapter 3, Paragraph 3.7) and measuring the individuals' psychological perceived balance that oriented their food consumption ("free-from" in this research) and composed of three conjuncts dimensions (see Chapter 3, Paragraph 3.1). The items formulated are the following:
 - *Cognitive*: "I pay a lot of attention to my diet";
 - *Behavioral*: "My food choices are a way to feel responsible for my life";
 - *Emotional*: "My food choices are a way to express myself."

The psychometric properties of this scale are evaluated here. All items are measured on seven-point Likert scales ranging from 1 = completely disagree to 7 = completely agree.

- **Level of change**, measured using Prochaska and DiClemente's (1983) Transtheoretical Model. This model was used to quantify on a representative sample of "free-from consumers" some of the insights that emerged from the qualitative study about the concept of "breaking event" (see Chapter 3, Paragraph 3.3) that triggered the change of diet. The Transtheoretical Model (TTM) of behavioral change has been beneficial to those interested in enhancing motivation for self-care. In this model, five distinct motivational stages are identified (Prochaska & Velicer, 1997). This model was previously used in the Italian context on different health changes (e.g. Bolognesi, Nigg, Massarini, & Lippke, 2006). The five stages are 1) *Precontemplation*: the individual is not intending to change in the foreseeable future; 2) *Contemplation*: the individual is not

prepared to take action at present, but is intending to within the next six months; 3) *Preparation*: the individual is actively considering changing his or her behavior in the immediate future (e.g., within the next month); 4) *Action*: the individual has actually made an overt behavior change in the recent past, but the changes are not well established; 5) *Maintenance*: the individual has changed his or her behavior for more than six months and is working to sustain that overt change. The items described here were created ad hoc on the basis of these five stages, one for each. Respondents decided to position their answer on the item that better represent their condition among the five.

- **Individual predisposition to social influence**, measured with an ad hoc short version of the Consumer Susceptibility to interpersonal Influence scale (Short Consumer Susceptibility - SCS), from original version by Bearden, Netemeyer, & Teel, 1989. The scale was chosen since it describes an individual need to enhance one's own image in the opinion of significant others through the acquisition and use of products/behavior. It was in fact adapted to be used as a mirror of the psychological predisposition to others' influence, which emerged as a key variable from the literature review (see Chapter 2, Paragraph 3.2.2). In the original form, the scale is composed of 12 items and two factors to be measured: informational and normative interpersonal influence. Due to the length and sustainability of the questionnaire, the author proposed a short version, choosing two items for each dimension, which is more in line with the aim of the study and evaluating their psychometric properties in this sample. All items are measured on five-point Likert scales ranging from 1 = strongly disagree to 5 = strongly agree.

- **Psychological self-evaluation**, measured with the Core Self-Evaluation Scale (CSES) (Italian version by Di Fabio & Busoni, 2006). According to Judge and colleagues (2003), core self-evaluation is a broad, latent, higher-order trait indicated by four well-established traits in the personality literature: 1) *self-esteem*, the overall value that one places on oneself as a person (Harter, 2006); 2) *generalized self-efficacy*, an evaluation of how well one can perform across a variety of situations (Tipton & Worthington, 1984); 3) *neuroticism*, the tendency to have a negativistic cognitive/explanatory style and to focus on negative aspects of the self (Watson & Casillas, 2003); and 4) *locus of control*, beliefs about the cause of events in one's life locus is internal when individuals see events as being contingent on their own behavior (Rotter, 1966). As one can gather from the commonality among these traits, core self-evaluation is a basic and fundamental appraisal of one's worthiness, effectiveness, and capabilities as a person. In the Italian version, this scale has been broadly adopted in studies on career management and work decision-making (e.g., Di Fabio & Palazzeschi, 2010). However, the author finds that this scale could be able to grasp a psychological aspect of worthiness and capability in food consumption, which emerged from the qualitative study (see Chapter 3). Moreover, the choice of this scale appears also as a good compromise to investigate a multi-component psychological core with a relatively few items, taking together the research sustainability and validity. All items are measured on five-point Likert scales ranging from 1 = strongly disagree to 5 = strongly agree.

2.3 Data Analysis

The descriptive analysis was computed on the total sample aimed at describing the consumption of lactose- and gluten-free products: consumption frequency, motivations, information, trust, health, and lifestyle were explored both in the population and for “free-from” consumers (see Paragraph 3.1). Then, the psychometric characteristics of the perceived balance in food consumption (PB-in Food) were evaluated (see Paragraph 3.2.1). In particular, for the PB-in Food asymmetry, kurtosis, mean, median, standard deviation, and normality of the distribution was checked, then factor structure and reliability was assessed with a two-step procedure (Kinicki, Jacobson, Peterson, & Prussia, 2013; Netemeyer, Bearden, & Sharma, 2003). Moreover, as adapted in a short version, for the Consumer Susceptibility to interpersonal Influence Scale (Short Consumer Susceptibility - SCS), the same procedures were undertaken in order to verify the scale reliability (see Paragraph 3.2.2). Finally, as already translated in Italian, only Cronbach’s Alpha was measured for the Core Self-Evaluation Scale (CSES) in order to verify the scale stability in this sample (see Paragraph 3.2.3). Then, the PB-in Food was correlated with the other psychological variables (CSES, and SCS) in order to explore their relations (see Paragraph 3.3); moreover, the position of “free-from consumers” in the change phase was described. An independent sample *t* test was then conducted in order to detect significant differences on the level of perceived balance between the total population and the “free-from” consumers (see Paragraph 3.4). Moreover, the PB-in food was used as a way to discriminate the level of perceived balance in food consumption among “free-from” consumers, dividing the sample with higher and lower scores (see Paragraph 3.4). Then the independent samples *t* test was again conducted to detect differences between these two sub-samples on the main psychological variables considered here (see Paragraph 3.5).

3. Results

3.1 Consumption of “Free-From” Foods in the Italian Context: An Overview

In this section, the author will report the results related to the first aim of this study. Descriptive results of the demographics variables are reported in Table 4.1. The sample includes 1004 Italian consumers, statistically representative of the population.

Table 4.1. Demographic profiles of the sample (N = 1004)

Gender	n	%	Income	n	%
Male	497	49.5	Until 600 €	43	4.3
Female	407	50.5	601-900 €	56	5.6
Age			901-1200 €	91	9.1
18-25	127	12.7	1201-1500 €	144	14.3
26-35	137	13.7	1501-1800 €	127	12.6
36-45	200	19.9	1801-2550 €	174	17.3
46-55	218	21.7	2551-3550 €	152	15.2
56-65	229	22.8	More than 3550 €	78	7.8
66-75	93	9.2	Missing	139	13.8
Education	n	%	Profession	n	%
No qualifications	3	0.3	Employed	663	66.1
Elementary	5	0.5	Unemployed/retired	341	33.9
Junior high	128	12.7	Inhabited center size	n	%
Senior high	561	55.9	Until 10000 inhabitants	478	47.6
College or university	307	30.6	10/30.000 inhabitants	140	14
Main household food purchaser	n	%	30/100.000 inhabitants	149	14.8
Yes, just me	536	53.4	More than 100.000	230	22.9
Yes, with others	439	43.7	Missing	7	0.7
No	29	2.9	Geographic area	n	%
Diagnosed intolerance	n	%	North-West	262	26.1
Yes	949	94.5	North-East	190	19
No	55	5.5	Center	198	19.7
			South and Islands	354	35.2

A “free-from food” consumption frequency variable was created ad hoc: first the author analysed the means, standard deviations, medians, asymmetry, and kurtosis of the items created to measure the frequency of consumption of both “free-from” gluten and lactose items (Table 4.2). The distribution seems to be normal, except for the lactose-free consumption kurtosis. Then the correlation coefficient between the two items was evaluated ($r = .474$, $**p = .0$); finally, a new variable was created (called “free-from food consumption”) as the average of both gluten- and lactose-free foods consumption’s frequency.

Table 4.2 Descriptive statistics for lactose- and gluten-free consumption frequency items

<i>Item</i>	<i>M</i>	<i>SD</i>	<i>Md</i>	<i>A</i>	<i>K</i>
<i>Lactose-free food consumption</i>	2,49	1.39	2.00	-0.51	-1.06
<i>Gluten-free food consumption</i>	2.16	1.26	2.00	-0.73	-0.65

Note: Answering scale from 1 = never and 5 = every day; N = 1004.

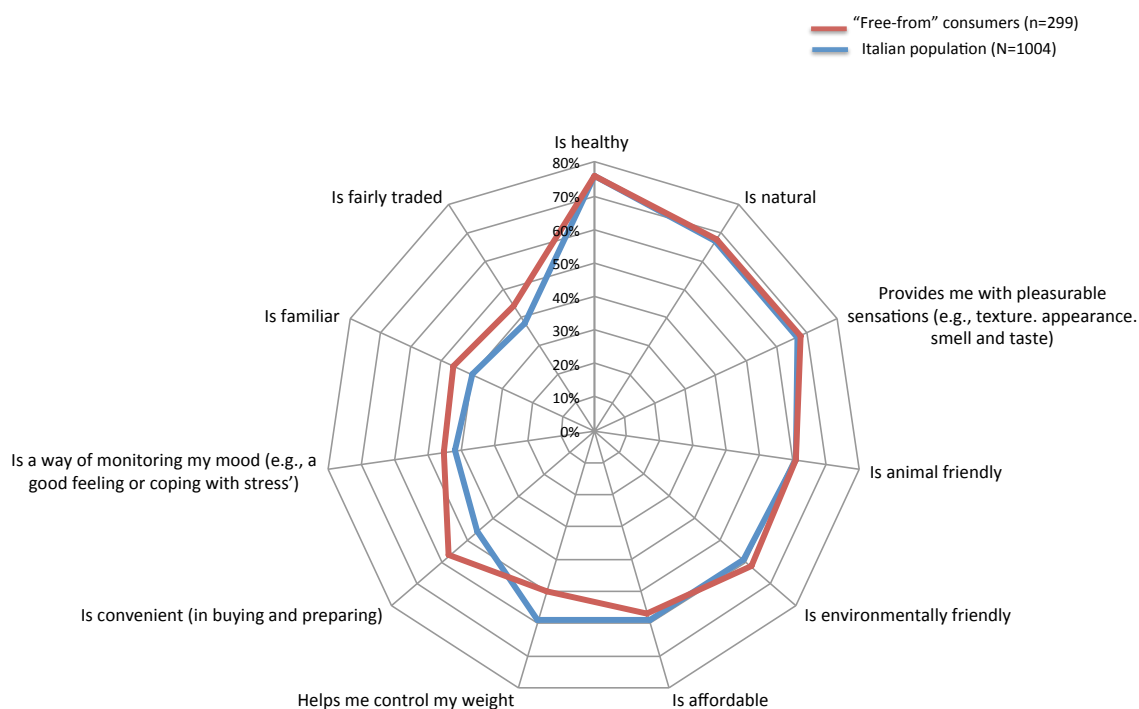
The new variable was also used in a second round of analysis to create a sub-sample of the population defined as “free-from consumers”. In this sub-sample was collapsed all the subjects who reported that they consume “free-from” products “often” or “every day” in the last month. 30% of the population (n = 299) was included in this sub-sample. The demographic profile of “free-from consumers” follows the average of the Italian population, except for age. In particular, “free-from consumers” are significantly more present ($p < .05$) in the age range 29 to 34 years old, (19% vs. 12% in the population), and less ($p < .05$) in the age range 55 to 75 years (29% vs. 37% in the population).

Motivation for Food Consumption

The motivation for food consumption was investigated through the single-item version of the Food Choice Questionnaire (FCQ). The following radar graph

(Figure 4.2) reports the frequency of “important” and “very important” scores on the scale, both for the entire population and the “free-from consumers” sub-sample. The results show that, in choosing their foods, the Italian population is mostly motivated by food healthiness (76%), naturalness (67%), and pleasurable sensations (67%). It is interesting to note that, even if the motivation of health is valued, people don’t renounce pleasure and enjoyment when deciding upon their foods. Compared to the population, the “free-from consumers” appear similar, except for convenience, which emerges significantly more frequent ($p < .05$) in this sub-sample (57% vs. 46% in the population), and for the weight control, which instead is significantly more frequent ($p < .05$) in the Italian population (59% vs. 50% in the sub-sample).

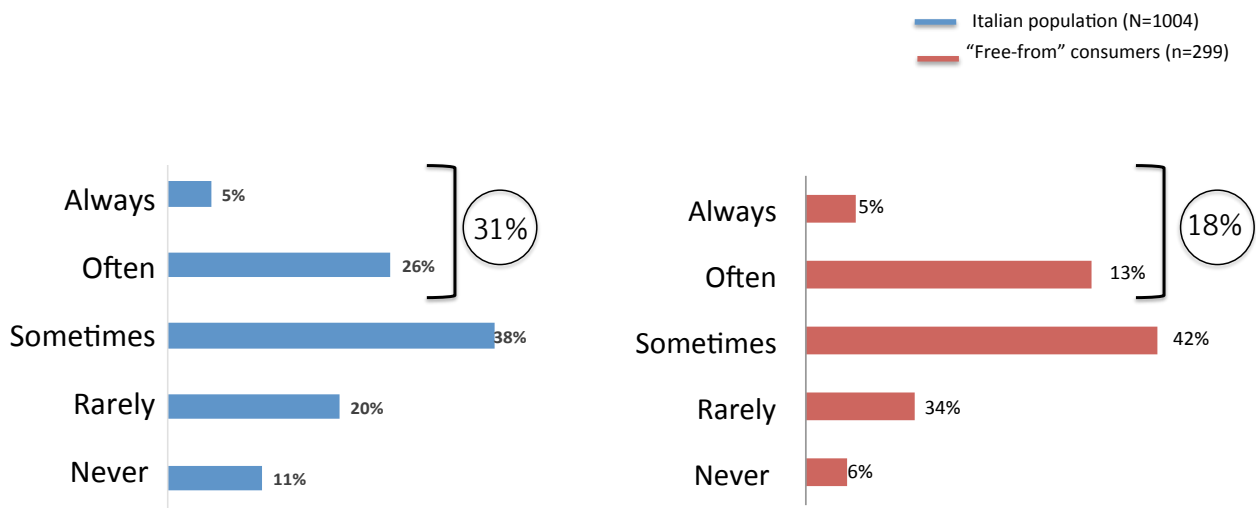
Figure 4.2. Motivations for food consumption



Information, Fake News, and Trust

The frequency of information searched about food, the credence given to fake news, and trust in sources were also explored. In particular, on a monthly base, results show that 31% of the Italian population search for information about foods “often” or “always”.. In general, it can be said that a consistent proportion of Italians is active in searching for information when it comes to the foods that they eat. On the other hand, 18% of the “free-from consumer” sub-sample searches for information “always” or “often”. In relation with the population, in the sub-sample, significantly fewer people search for information ($p < .05$; Figure 4.3).

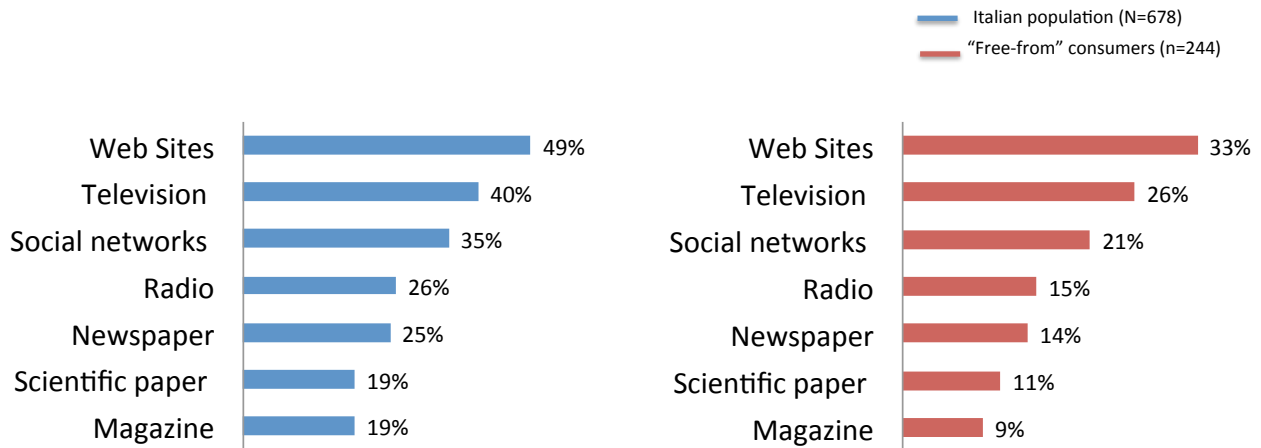
Figure 4.3 Frequency of information searched (Italian population VS “free-from consumers”)



Moreover, among the Italian people who search for information (sometimes, often, and always: N = 678), it was possible to see that web sites, social media, and television are the most used means both in the population (respectively, 49%, 40%, and 35% of the population) and among “free-from

consumers” who search for information (sometimes, often, and always: n = 244) (respectively, 33%, 26%, and 21%). Results are reported in Figure 4.4.

Figure 4.4 Means of information (Italian population VS “free-from consumers”)



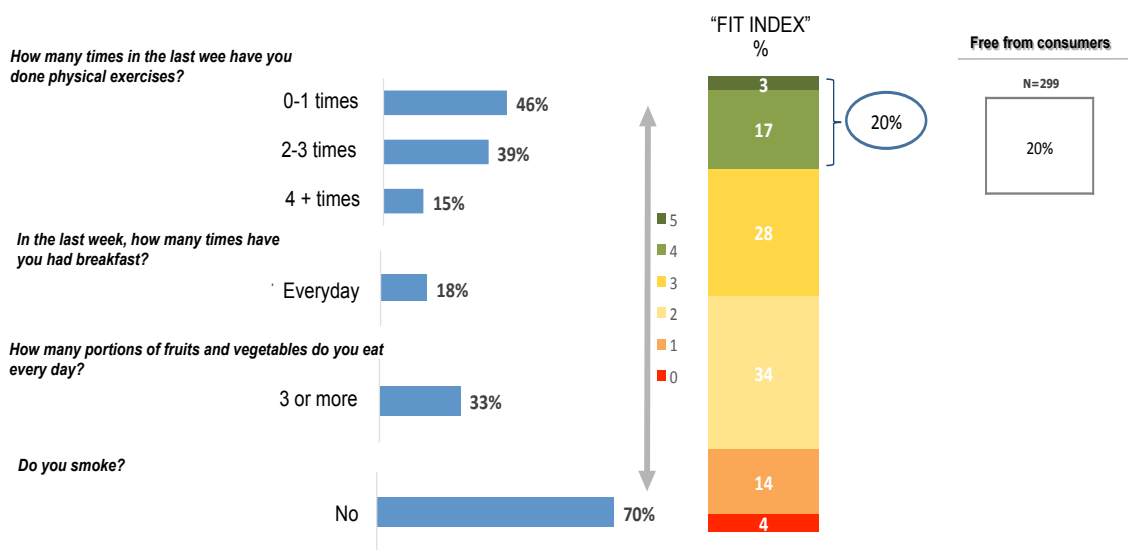
In searching for information, 18% of the population believed information later revealed as fake news; among the “free-from consumers”, the number was 25%, which means significantly more people ($p < .05$).

Finally, the most trusted sources of information (“I trust quite or very”) are professional figures (doctors) for 59% of the population, followed by family and friends (51%) and consumer advocacy groups (41%); the least trusted are politicians (9%). For the sub-sample of “free-from consumers”, professionals are always the most trusted source (for 61% of the sample), followed by family and friends (53%) and groups for consumer advocacy (46%). What is interesting to note is that in this sample, trust in politicians is significantly higher ($p < .05$), as 18% of those interviewed affirmed that they trust them.

Health, Satisfaction, and Lifestyle

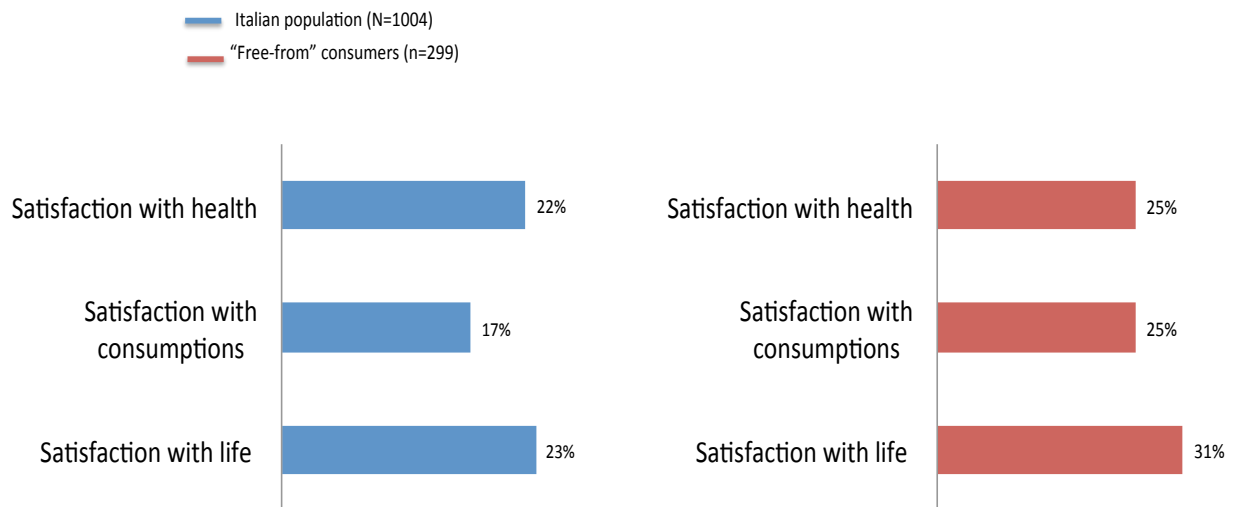
Among the population, 13% suffers from a diagnosed food intolerance, of which the majority has been diagnosed by a professional figure (81%). Among “free-from consumers” 23% reported a food intolerance diagnosis, for the 87% diagnosed from a professional figure. Relevant figures mentioned in the open answer question were, among others, allergists, nutritionists, and general practitioners, but tests for self-diagnosis were also mentioned. Moreover, 20% of Italians appear to be in a healthy condition given the “fit index” that is evaluated here. “Free-from consumers” appear to be in line with these results (Figure 4.5).

Figure 4.5 Fit index (Italian population VS “free-from consumers”)



Moreover, 17% of the population appears satisfied with their consumptions, and 22% are satisfied with their life as a whole. The sub-sample of “free-from consumers” appeared instead significantly more satisfied ($p < .05$) with their consumption (25%) and with their life (31%). In both the samples, nearly a quarter of those interviewed appeared to be satisfied with their health (Figure 4.6).

Figure 4.6 Satisfaction scores (Italian population VS “free-from consumers”)



3.2 Psychometric properties of the selected measures

The following paragraphs report the results of the psychometric evaluation of the PB-in Food and SCS scale. For the CSES, which has already been used in this study in the original validated Italian version, only Cronbach’s Alpha was measured in order to verify its validity in this population.

3.2.1 Psychometric Evaluation of the Perceived Balance in Food Consumption (PB-in Food)

Descriptive Statistics

Descriptive statistics were computed for each item, and the normality of the distribution was checked. Table 4.3 shows the means, standard deviations, medians, and skewness of PB-in Food items under analysis.

Table 4.3 Descriptive statistics for PB-in Food items

<i>Item</i>	<i>SD</i>	<i>Md</i>	<i>A</i>	<i>K</i>	
<i>Le mie scelte alimentari sono un modo per esprimere me stesso (My food choices are a way to express myself) (PB-in Food1)</i>	5.16	1.24	5.00	-0.55	0.66
<i>Le mie scelte alimentari sono un modo per sentirmi responsabile (My food choices are a way to feel responsible for my life) (PB-in Food2)</i>	5.43	1.16	5.00	-0.8	1.52
<i>Presto molta attenzione alla mia dieta (I pay a lot of attention to my diet) (PB-in Food3)</i>	5.46	1.14	5.00	-0.5	0.3

Note: Answering scale from 1 = “completely disagree” to 7 = “completely agree”; N = 1004.

Results revealed good descriptive properties, except for PB-in Food2, which has a non-normal distribution. The inter-item correlations appear good (Table 4.4).

Table 4.4 Inter-item correlations among PB-in Food items

	<i>PB-in Food1</i>	<i>PB-in Food2</i>	<i>PB-in Food3</i>
<i>PB-in Food1</i>	1.00	0.72**	0.52**
<i>PB-in Food2</i>		1.00	0.62**
<i>PB-in Food3</i>			1.00

Note: **p < 0.01; N =1004.

Moreover, in order to evaluate the structure of the PB-in Food items first and subsequently check the adequacy of the items to each dimension, the sample of N = 1004 participants was randomly divided into two sub-samples— one sample of n = 558 for an exploratory factor analysis (approximately 60%

of the total sample) and one sample of $n = 416$ for a confirmatory factor analysis (approximately 40% of total sample) explained in the following.

Exploratory Factor Analysis (EFA)

Factor analysis was performed on a sub-sample ($n = 558$, approximately 60% of the total sample) to estimate the factor loadings, to allow for greater accuracy of variable clustering, and to minimize the covariance among elements of factors (Arbuckle, 2003; Conway & Huffcutt, 2003). The analysis with an unconstrained number of factors yielded eigenvalues of 1,831 with 73% of the variance explained. These results confirmed the mono-factorial structure of this scale, with all three items loading above .7 ($\alpha = .81$).

These results are in line with the qualitative insights, which highlighted the simultaneous individual activation on three psychological dimensions (cognitive, behavioral, and emotional) in contributing to people's reacquisition of the so defined "perceived balance" after a breaking event through "free-from" food consumption (see Chapter 3).

Confirmatory Factor Analysis (CFA)

Next, to check the adequacy of the items for the identified dimensions, a confirmatory factor analysis was run using the second sub-sample of $n = 416$ (approximately 40% of the total sample). The model was estimated using maximum likelihood with robust standard errors and evaluated using the chi-square and approximate fit statistics, based on Hu and Bentler (1999). These included root mean square error of approximation (RMSEA) < 0.05 ; confirmatory fit index (CFI) = 1; and Tucker-Lewis index (TLI) = 1.

Results are reported in Table 4.5.

Table 4.5 PB-in Food: CFA and reliability indexes

	Stand. Factor loadings	SE	P
PB-in Food1	0.86	0.02	***
PB-in Food2	0.88	0.02	***
PB-in Food3	0.68	0.03	***

Note: ***p < 0.001; N = 416

(2) χ^2 0.00; df=0; p=0.000, CFI=1.00; TLI=1.00; RMSEA=0.00 (LO90 = 0.00, HI90 =0 .00).

(3) CR= composite reliability; AVE= average variance extracted.

3.2.2 Psychometric evaluation of the Short Version of Consumer Susceptibility to Interpersonal Influence Scale (Short Consumer Susceptibility Scale)

The same procedures described for the PB-in Food have been applied to the SCS scale. In particular, descriptive analyses, EFA, and CFA were run.

Descriptive Statistics

Descriptive statistics were computed for each item, and the normality of distribution was checked. Table 4.6 shows the means, standard deviations, medians, and skewness of SCS items under analysis.

Table 4.6 Descriptive statistics for Short Consumer Susceptibility items.

<i>Item</i>	<i>M</i>	<i>SD</i>	<i>Md</i>	<i>A</i>	<i>K</i>
<i>Al momento dell'acquisto, scelgo brand che i miei amici apprezzerebbero</i> (When buying products, I generally purchase those brands that I think others will approve of) SCS-1	3.5	1.6	4.00	-0.01	-0.5
<i>È importante che ad altri piacciono i prodotti ed i marchi che acquisto</i> (It is important that others like the products and brands I buy.) SCS-2	3.3	1.7	3.00	0.2	-0.8
<i>Se ho poca esperienza con un prodotto, chiedo spesso ai miei amici un parere</i> (If I have little experience with a product, I often ask my friends about the product) SCS-3	4.3	1.4	5.00	-0.5	0.3
<i>Chiedo spesso informazioni ad amici o familiari su un prodotto prima di acquistarlo</i> (I frequently gather information from friends or family about a product before I buy.) SCS-4	4.1	1.4	4.00	-0.3	-0.6

Note: Answering scale from 1 = "strongly disagree" to 5 = "strongly agree"; N = 1004.

Results revealed good descriptive properties, except for SCS-2, which has a non-normal distribution. The inter-item correlations appear good (Table 4.7).

Table 4.7 Inter-item correlations among SCS items.

	<i>SCS 1</i>	<i>SCS 2</i>	<i>SCS 3</i>	<i>SCS 4</i>
<i>SCS 1</i>	1.00	0.82**	0.43**	0.49**
<i>SCS 2</i>	0.82**	1.00	0.39**	0.47**
<i>SCS 3</i>	0.43**	0.39**	1.00	0.70**
<i>SCS 4</i>	0.49**	0.47**	0.70**	1.00

Note: **p < 0.01; N =1004.

Exploratory Factor Analysis (EFA)

Exploratory factor analysis was performed with the same procedures as for the PB-in Food on a sub-sample of 602 subjects (approximately 60% of the population). Different from the original version, which was composed of two factors, the analysis with an unconstrained number of factors implemented here describe a mono-factorial structure, with yielded eigenvalues of 2,39 and 66% of variance explained; all the four items loading are above .8 ($\alpha = .83$).

Confirmatory Factor Analysis (CFA)

A confirmatory factor analysis was run using the same procedures as for the PB-in Food on a sub-sample of 402 subjects. (approximately 40% of the population). The model was estimated using maximum likelihood with robust standard errors and evaluated using the chi-square and approximate fit statistics, based on Hu and Bentler (1999). These included root mean square error of approximation (RMSEA) < 0.05; confirmatory fit index (CFI) = 1; and Tucker-Lewis index (TLI) =1. Values are reported in table 4.8.

Table 4.8 SCS Scale: CFA and reliability indexes

	Stand. Factor loadings	SE	P
SCS 1	0.99	0.03	***
SCS 2	0.83	0.03	***
SCS 3	0.97	0.04	***
SCS 4	0.89	0.04	***

Note: ***p < 0.001; N = 402

(2) χ^2 0.00; df=0; p=0.01, CFI=0.99; TLI=0.90; RMSEA=0.61 (LO90 = 0.00, HI90 =0.16).

(3) CR= composite reliability; AVE= average variance extracted.

3.2.3 Psychometric evaluation of the Core Self Evaluation Scale (CSES)

Finally, for the CSES, the author referred to the Italian validation, which confirmed the original factorial mono-factorial structure as in the original Judge et al., 2003. In this sample, the core self-evaluation scale showed an acceptable Cronbach's Alpha of 0.67 (Loewenthal, K. M., 2001).

3.3 Exploring the relation among the psychological dimensions

After being evaluated for their psychometric properties, the above-mentioned measures (PB-in Food, CSES, and SCS) were correlated in order to explore their relations. Results of the correlation analysis are reported in Table 4.9.

Table 4.9 Correlations among psychological measures here adopted.

	<i>PB-in Food</i>	<i>CSES</i>	<i>SCS</i>
<i>PB-in Food</i>	1.00	,181**	,144**
<i>CSES</i>		1.00	-,135**
<i>SCS</i>			1.00

Note: ** $p < 0.01$; $N = 1004$.

The results show that the psychological variables studied here are significantly correlated. In particular, PB-in Food has a discrete positive correlation coefficient both with CSES and the SCS. That means that the individual perceived balance in food consumption grows together with the perceived self-efficacy and sense of worthiness and with susceptibility to social influence, thus confirming some of the insights of the qualitative study (Chapter 3). CSES and SCS scale have instead a discrete negative correlation coefficient, which means that the perceived self-efficacy and susceptibility to social influence have an inverse relation. Also, these results appear in line with some

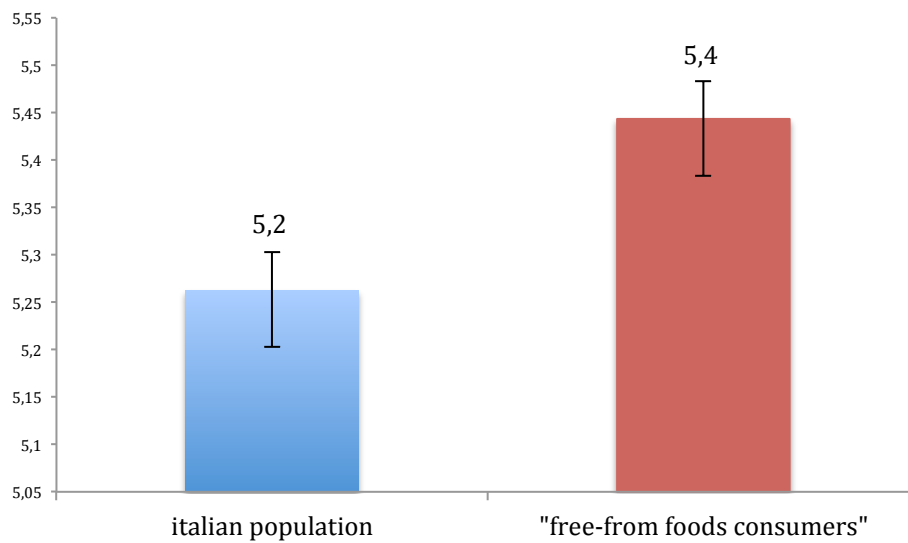
insights from the qualitative study, related to the fact that the more the consumers perceive to be in charge of their food consumption, the less they can be influenced by others' opinions.

3.4 The role of Perceived Balance in “free-from” food consumption

In order to identify the role of “perceived balance” in determining gluten- and lactose-free consumption, the author first verified the differences on this variable between the population and the “free-from consumers” sub-sample. In doing so, due to the results of the psychometric evaluation of these items (see Paragraph 3.2.1, Table 4.2), the author here decided to divide the “free-from consumers” sub-sample into two levels: the lower includes the answers below the average ($M = 5,3$; scores from 1 to 5 were included; $n = 146$), the higher includes the answers above the average (scores 6 and 7; $n = 165$). This decision was taken in order to give relevance to the data since the medium score was relatively high, but the limits of this decision are further discussed in the last paragraph. An independent sample t test was implemented in order to explore eventual differences of PB-in Food levels between the two samples.

A significant, even if low, difference between the level of perceived balance in food consumption was found ($t = 2,56$; $p < .05$). In fact, the sub-sample of “free-from consumers” has a significantly higher score in the PB-in Food (see Figure 4.7).

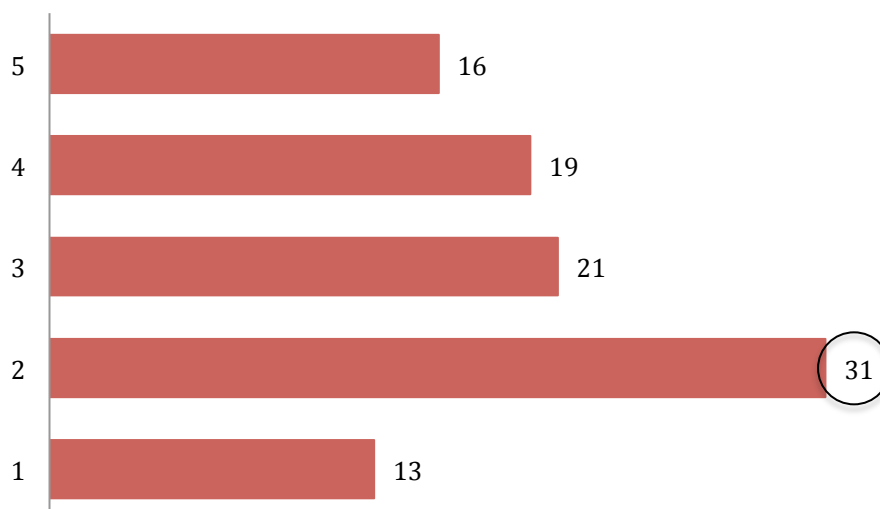
Figure 4.7 Differences on the PB-in Food between the population and “free-from consumers” sub-sample



Note: The PB-in Food score is significantly different in the two samples considered at the .05 level.

Moreover, descriptive analyses highlighted as the sub-sample of “free-from consumers” is positioned in the 2nd phase of change (*Contemplation*; $p < .05$), which means that the individual is actively considering changing his or her behavior in the future (within the next 6 months) in order to achieve a healthier lifestyle (Figure 4.8).

Figure 4.8 “Free-from consumers” stage of change

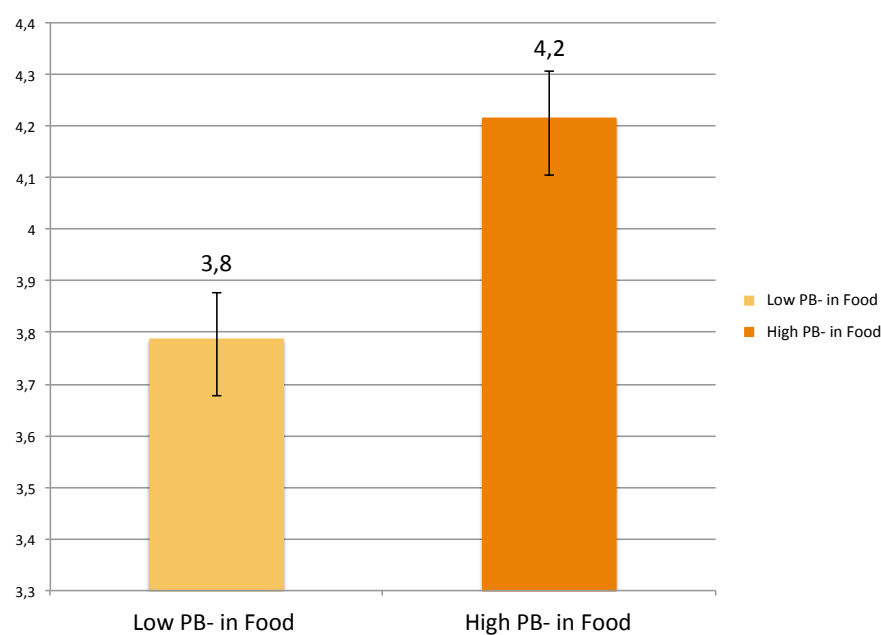


Having these results in mind, the author used the PB-in Food to discriminate two sub-samples of “free-from consumers” considering their level of perceived balance, since it was found to have a role in determining this consumption.

3.5 A psychological portrait of “free-from consumers”: differences between high and low PB-in Food scores

A series of independent sample *t* tests were implemented in order to explore possible differences between people with high and low scores of perceived balance in food consumption in the sub-sample of “free-from consumers”. This allowed the author to describe the psychological profiles of these individuals. In more detail, the differences were evaluated on the CSES and the SCS. A significant difference between the CSES and the level of PB-in Food was found ($t = 2,94$; $p < .05$) (Figure 4.9).

Figure 4.9 Differences on the level of self-evaluation (CSES) between “free-from consumers” with low and high perceived balance in food consumption (PB-in Food)

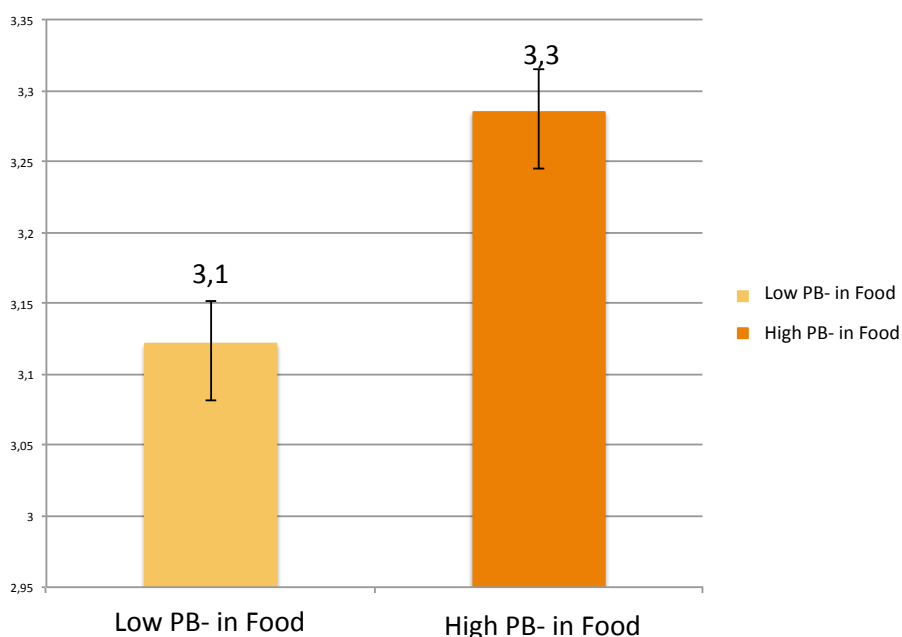


Note: The CSES score is significantly different in the two samples considered at the .05 level.

In particular, individuals with higher levels of perceived balance in food consumption have significantly higher scores of self-efficacy and perceived worthiness, which is in line with the preliminary qualitative insights (see Chapter 3, Paragraph 4).

A significant difference was also found in relation to the consumer susceptibility to social influence, as consumers with higher PB-in Food scores have also higher scores on the SCS (Figure 4.10).

Figure 4.10 Differences on the level of susceptibility to social influence (SCS) between “free-from consumers” with low and high perceived balance in food consumption (PB-in Food)



Note: The SCS score is significantly different in the two samples considered at the .05 level.

To sum up briefly, the psychological dimensions considered here appear related to the concept of perceived balance in food consumption.

4. Discussion and Conclusion

The study presented here appears as a first attempt to study the phenomenon of gluten- and lactose-free food in the Italian context, with a particular focus on its psychological determinants. To the best of our knowledge, and from the results of the systematic analysis of the scientific literature (see Chapter 2), no previous studies focused on both of these food categories in order to understand what brings people to change their diets and which psychological variables have a role in this process. Moreover, the results of the second study on the prototypical case of tolerant consumers (see Chapter 3) suggested the potential role of psychological elaboration as a key variable in describing this phenomenon.

Having these results in mind, this study proposes a quantitative exploration of this consumption trend in the Italian context with the aim of describing the psychological portrait of “free-from consumers”.

Going through the main results, the self-reported consumption data suggest that in the Italian context, “free-from” consumption involves a remarkable portion on the population (30%), thus confirming some market trends remarked on here in the premises. Moreover, with regard to their motivations for food consumption, even if the most important motivation is health, people seem not to renounce satisfying their senses, since they look for pleasantness and satisfaction in their food choices. For “free-from consumers”, in addition, the motivation of controlling their weight is significantly lower, highlighting the fact that these consumers see foods not as a “reparation food” to remedy a health status that is perceived as not good. In line with these results, other studies highlighted the role of health in driving consumer food choices, in particular in the last few decades (e.g. Apaolaza, Hartmann, D'Souza, & López, 2018; Barauskaite et al, 2018), and in particular towards these new foods trends (Norwood et al., 2019; Christoph et al., 2018). At the

same time, these results also suggest that the cultural framework of Italian cuisine still is one of the most important drivers for consumers, and this can potentially be a key for understanding the Italian food situation, as reported in other articles (e.g. Poli et al., 2019). These authors, indeed, proposed a narrative review underlying the role of the cultural and social dimensions in contributing to healthy eating among Mediterranean populations, such as Italians.

With the use of the perceived balance in food consumption variable, developed here from the results of the second study, it is possible to explore in the broader population some of other insights. Considering the psychometric analysis, the scale appears to be a good tool to detect the “perceived balance” that emerged as a core category in the qualitative study, working with three items on the three main DNA dimensions of this psychological process: cognitive, behavioral, and emotional; however, some critical methodological aspects will be further discussed. With regard to the role of this psychological process in gluten- and lactose-free food consumption, the data confirmed that the look for a new (perceived) balance can be a key element in the turn to “free-from” diets. In particular, as the sub-sample of “free-from consumers” registered a significantly higher level of PB-in Food when compared to the entire population, it can be said that this dimension appears as a psychological “gateway” that consumers enter in response to a period of change. In fact, the results on the use of Transtheoretical Model (Prochaska & DiClemente, 1983) confirmed that these consumers are looking for a healthier lifestyle and are ready to change for it in the near period of time. In the scientific literature, scholars have used this model in the field of food consumption, but more in relation with dietary changes (Nakabayashi, Melo, & Toral, 2019; Hashemzadeh, Rahimi, Zare-Farashbandi, Alavi-Naeini, & Daei, 2019) as a way to segment people and to adapt eventual interventions, but never in relation to “normal” consumers who change voluntary their diet to lactose- and gluten-free

products. In this study, the author followed up on the idea to segment consumers on the basis of their intention to change in the future and to identify at which stage “free-from consumers” are to be found. As Grounded Theory interviews highlighted in the “breaking event” —and in the subsequent consumers’ willingness to re-acquire a psychological balance— the trigger for starting a “free-from” diet in tolerant consumers, finding these consumers in the 2nd phase (*Contemplation*) can be considered here as a confirmation. In particular, from these results it is possible to say that people who are in the second phase are willing to undertake a change in their life and lifestyle in the next future, as they have already elaborated the psychological necessity to do something to move from their present condition. Even if from these results it is not possible to verify the presence of a specific “breaking event,” it is possible to say that in some ways the sub-sample of “free-from consumers” in the Italian population perceive themselves in this condition of change, which may have triggered —in the broader framework— a reconfiguration of their diets.

Having said that, further analysis allowed the author to propose a first and deeper portrait of “free-from consumers”, with a specific focus on their psychosocial dimensions. In taking together various results previously discussed in detail, it is possible to say that – in comparison to the Italian population – less of “free-from consumers” search for information, mostly on Websites, but they believe more Fake News; in parallel, they are more satisfied with their consumptions and life, and they scored higher level of perceived balance (PB-in Food) always compared to the population. Moreover, when “free-from consumers” sub-sample is divided in higher and lower scores of perceived balance, the ones with higher scores of perceived balance have also higher levels of self-efficacy and sense of worthiness and higher level of susceptibility to interpersonal and social influence.

To sum up, it appears that this psychological sense of stability, reported by the scores on the psychological scales adopted here, may be apparent and

that the choice of a “free-from” diet may be susceptible to the willingness of these consumers to find again a balance they have lost consequently to a “breaking event.” In doing so, they may be looking for an elusive balance, which emerged both from the interviews and the quantitative exploration proposed here. In this direction, in addition, it has to be noticed that if the CSES is negatively correlated to the measure of consumer susceptibility to social influence, thus underlying a negative relation between these variables, the PB-in Food results are positively correlated with that, highlighting that the level of perceived balance and social susceptibility grow together. That could be interpreted, indeed, as a first confirmation of the qualitative results that describe the outcome of the process of dietary change as an “elusive”, “perceived” balance, which consumers may look for as a way to re-establish their food projects in a period of change (destabilization) through “free-from” diets. These foods in fact are in the consumers’ opinions strongly and symbolically related to an immediate sense of cleanliness and purity (see Chapter 3, Paragraph 4). Together with that, the fact that “free-from” foods are nowadays under the light of the public opinion, as described in Chapter 1, could contribute to increasing their perceived “resolutive” value through social influences and a not-always-appropriate-and-effective informational background.

To sum up, the quantitative study allowed us to give statistical relevance to some of the insights that emerged from the qualitative research proposed in Chapter 2 and 3, giving the first confirmation of the role of the psychological dimension in lactose- and gluten-free food consumption. In particular, through the use of the perceived balance in food consumption variable, it was possible to detail a psychological portrait of these consumers in the Italian context, which was lacking in the scientific literature.

However, some limitations and indications for future studies are here highlighted. In particular, one first element of discussion is the fact that the analysis was not conducted while dividing intolerant and tolerant consumers. As

reported in the previous chapters, indeed, the differentiation between effective tolerant and intolerant consumers is hard to detect, as the multifaceted nature of this intolerance doesn't allow one to have a real snapshot of the phenomenon. In this research, in line with the epidemiological statistics, only 5% of the Italian representative sample reported a diagnosed intolerance, not exclusively in relation to lactose or gluten. As a consequence, no comparison between these two groups was possible. Moreover, as many individuals (and sometimes professional figures) often rely just on physical symptoms to eliminate (or suggest to eliminate) these foods from one's diet, the presence of medically diagnosed intolerance appears difficult to detect with precision. Moreover, due to the means (CAWI) and self-reported nature of this study, even if the author measured the prevalence of the gap between diagnosed and non-diagnosed intolerance, the data were incomparable, as the frequency of reported non-diagnosed intolerance was really low. The author suggests in fact for future studies to find a way to detect this discrepancy with appropriate methods and to use it to discriminate between these types of consumers. In addition, another consistent point of discussion is the psychometric evaluation of the PB-in Food, which was here built on the qualitative insights and tested in the Italian population. This measure, indeed, scored in this study a relatively high mean ($M=5.3$ on a seven-point scale) and this can be discussed as a possible consequence of the items' formulation. It appeared, indeed, that these items elicit social desirability in the way they have been formulated, so as to score higher levels in the sample. This result had consequences on the way that the people were divided into two levels, which did not perfectly correspond to the theoretical scale formulation. Moreover, even if the scale behaved quite well in the explorative factor analysis, some issues related to the distribution have been found for the second item. In addition, the model that emerged from the confirmatory factor analysis was described as "just identified" with no freedom grades, thus putting in discussion the future validation of this

measure. In this direction, even if this first version of the scale appears interesting in discriminating some consumers' psychological orientations, from the strict psychometric perspective, it appears not completely ready to be validated and used in other contexts. For these reasons, on the basis of these preliminary results, future studies will need to be undertaken to improve the formulation of the scale and its validation. Moreover, future studies should also consider other information not included in this questionnaire for its sustainability, which are still discussed in literature as relevant in determining different type of consumption, such as the place of purchase (Lee et al., 2007). To conclude, a similar discussion is proposed here in relation to the other psychological variables involved in this study. Due to the lack of translated validated measures, sustainability, and environmental constraints of this study, some of the scales have not been used in their original version. Even if the author assessed their psychometric properties, it is suggested that there be a further exploration of the psychological variables involved in the study of this phenomenon. The author thus suggests with further studied to overcome these limitations here described.

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CHAPTER FIVE

CONSUMER PSYCHOLOGY TO DISENTANGLE NEW DIETARY TRENDS: WHAT TO LEARN FROM THE STUDY OF “FREE-FROM” CONSUMPTIONS IN THE ITALIAN CONTEXT

Food intolerance is a complicated phenomenon, which requires many different disciplines to be understood, and this is particularly relevant in a context like the Italian. In our country, indeed, food has a central role in determining not only our diets, but also our lifestyles. One element among the others is the Mediterranean diet, which is still recognized in the world as one of the cornerstones of the healthy living. However, due to new consumers' orientations towards “free from” foods, many are the challenges rising. Public health and nutritional sciences are working to find effective ways to deal with people's intolerance diagnoses, in the face of an increasing pandemic; economists and marketers are focusing on the rise of new food trends and possible negative consequences on national's industrial assets; food scientists are evaluating new foods formulations in response to nutritional needs with an eye to their sensory appeal. However, to date, there are many light and dark sides related to this phenomenon and a psychological contribution seems to be lacking.

Within this scenario, the aim of this dissertation was to explore the consumption of lactose- and gluten-free foods in the Italian context, from a psychological perspective, in order to shed a light on this controversial phenomenon. Despite the free from trend is claimed to be one of the most

promising food innovations, the complete elimination of gluten and lactose from diets of tolerant consumers brings with it several nutritional, economic, medical and psychological challenges. To answer this research question, a mixed-methods study was implemented, combining both qualitative and quantitative approaches. In more detail, three studies were conducted.

In Chapter 1, an overview of the main actors in this phenomenon has been offered, with the aim of better describing the framework of this dissertation and to highlight the background from which results could be interpreted. The complexity of this background called, first, for an exploration of the scientific literature in order to set the scene for empirical works.

In Chapter 2, with the aim of deeply discussing the extant literature and to provide a conceptual model of understanding of lactose- and gluten-free food consumption, a systematic integrative literature review has been proposed. This study sought to map consumer-related determinants of this consumption, to organize this knowledge into an integrated conceptual model, and to highlight differences between tolerant and intolerant consumers. Along with that, research gaps have been identified related to the psychological motivations of tolerant consumers who change their diets.

According to that, Chapter 3 mainly focused on this target in order to detail their experiences in voluntary turning to “free-from” diet, while exploring the psychological processes that characterized this change. A qualitative study with 30 individual interviews - conducted according to the principles of Grounded Theory - was developed. In brief, results show that the decision of turning to lactose- and gluten-free diets was triggered by a “breaking event” that interrupted consumers’ lives. A multi-componential DNA of this psycho-social phenomenon made of behavioral, cognitive, and emotional consumers’ activation concurred to the process of changing diet. People found in the “free-from” foods a symbolic and representational way to re-establish a new “perceived balance” in their lives.

Finally, since a snapshot of this phenomenon in the Italian context was lacking, in Chapter 4 a cross-sectional study was undertaken in order to describe a psychological portrait of “free from” consumers by exploring the role of the psychological dimensions identified in previous studies. This quantitative investigation gave consistency to some of the insights from the qualitative exploration by highlighting the role of perceived balance in food consumption (PB-in Food) in opening the way to “free from” diet adoption and in detailing the different psychological profiles of those consumers. Moreover, as it was possible to glimpse from the interviews, people with higher PB-in Food scores appear to have an “illusive” —perceived, exactly— psychological balance, still subject to social and informational influences, when compared to the others.

Even if further research is needed in order to give consistency to these results, it is possible here to trace some opportunities related to the role of psychological factors in the study of these new food orientations.

One simple but key result is that behind this food trend, there is a psychological process of life change and consequent search for balance. These consumers, indeed, appear involved in a deep psychological change, and they are trying to rebuild themselves through new food (and lifestyle) plans. This has to be framed in the socio-cultural and economic period our country is facing, which surely is leaving deep marks on consumers’ lives. Economic and work uncertainty, confusion and disorientation in health issues, consumers’ needs to be at the center of their lives... are just some of the characteristics of the modern situation in which consumers are living today, which are impacting also on their perceptions about consumptions (Lozza, Bonanomi, Castiglioni, & Bosio, 2016³). In this sense, the “breaking event” conceptualized in Chapter 3 may be interpreted not only as a special or peculiar event, but more as a general and diffuse sense of uncertainty, a psychological disorientation, and a

³ Lozza, E., Bonanomi, A., Castiglioni, C., & Bosio, A. C. (2016). Consumer sentiment after the global financial crisis. *International Journal of Market Research*, 58(5), 671-691.

lack of balancing pillars, all of which are characteristic of our historic milieu. From this perspective, some inexplicable or apparently contradictory phenomena, such as the “free from” diets, can be framed as an attempt to regain lifestyle projects and plans, even if it does not always come with the expected or effective results.

In supporting this way to look at food phenomenon, health and food psychology can offer a key to understanding these deep symbolic processes that drive people’s orientations.

Further, the author here discuss the potential role of this approach to food consumption in helping public and private stakeholders to understand these changing consumers to promote sustainable food lifestyles. As clearly defined by World Health Organization: *“Diet evolves over time, being influenced by many social and economic factors that interact in a complex manner to shape individual dietary patterns. These factors include income, food prices (which will affect the availability and affordability of healthy foods), individual preferences and beliefs, cultural traditions, and geographical and environmental aspects (including climate change). Therefore, promoting a healthy food environment – including food systems that promote a diversified, balanced and healthy diet – requires the involvement of multiple sectors and stakeholders, including government, and the public and private sectors”* (WHO, 2018⁴).

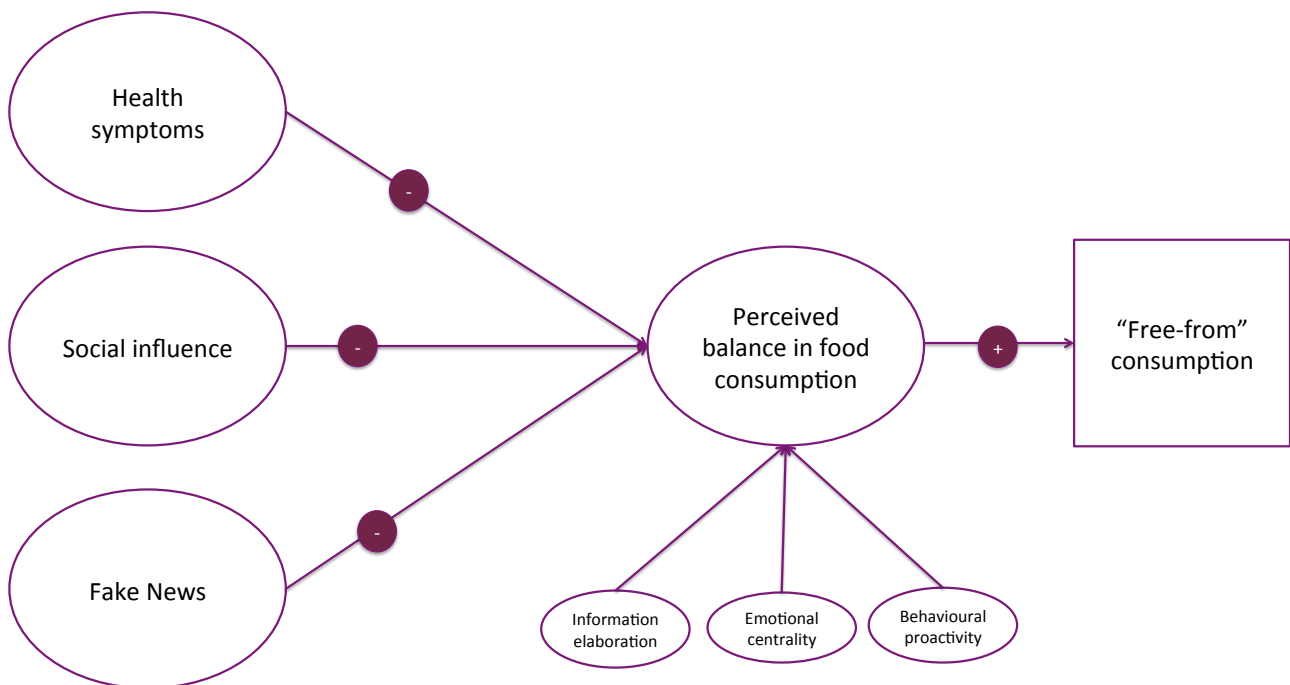
Focusing on the last sentence, in particular, it appears clear as the goal of healthy diets is to have a balanced and diversified regimen, with the help of influential but authoritative actors. The rise of gluten- and lactose-free diets, however, risks moving people away from this goal, for several reasons (as extensively described in the previous paragraphs), which don’t always appear explicable. In this case, consumers can become the key of interpretation if understood and involved. To understand consumers perspectives, a

⁴ <https://www.who.int/news-room/fact-sheets/detail/healthy-diet>

psychological approach is essentially needed, because able to go over the surface of the phenomenon and to explore deep meaning-making processes.

In particular, in Figure 5.1 the author presents an attempt to synthesize results of the three studies described in this dissertation. In this model, indeed, the role of the psychological dimension (defined as the individual capability to perceive a balance in food consumption) is highlighted, in mediating the impact of some of the most relevant consumers' motivations (but also potential pitfalls) to "free-from diets": the perception of health symptoms, which impacts the broader individual's psychosomatic level; the information, which appear as one of the pillars for consumers to fill their uncertainty, not without risks to fall into fake news; and social influence, which can support, but also disorient more and more consumers who already feel in an moment of life crisis.

Figure 5.1 Proposed model to be verified



Consumers' need to find a psychological balance in their food consumptions emerged here as having the essential role of being the "gate" for consumers to engage in "free from" diets. It can be discussed, moreover, that this variable could have the role in mediating the influence between consumers' more explicit motivations and the consumptions' behaviors, by working on a deeper and more elaborative level.

In line with this discussion, this dissertation provides a preliminary attempt to understand the lever for consumers' dietary education and potential change. The case of food intolerance, being on the boundary between medical need and a consumer's lifestyle, between proper and improper food choices, is here considered as a critical stage for studying these dimension that, if confirmed, could be applied also to others diets. Future studies will have the goal to verify the theoretical assumptions proposed in this model and to eventually apply them to other food consumption's settings.

To conclude, this dissertation appears as a first attempt that, reflecting on the critical case of lactose- and gluten-free diets, would underline potentialities for psychology to intervene in this field and to promote consumer health and wellbeing through food consumptions.