Nutritional information as a source of consumer power and psychological empowerment

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Abstract

The aim of this research is to determine the extent to which the use of the Internet and web technologies can enhance consumer power and psychological empowerment. Based on theories of power and empowerment, a model is proposed to improve the understanding of consumers' attitudes towards their food choices. The results show that the model tested among 300 Moroccan consumers using the structural equation method PLS explains a positive and direct effect between the use of the Internet and web technologies and the power of consumers in terms of food, and consequently their psychological empowerment in their food decision-making.

***Keywords**: Internet, Web technology, Power, Psychological empowerment, Food.*

1. Introduction

In the context of the producer-consumer relationship, the use of the Internet and the development of connected objects, social media, and nutrition applications promote the effect of consumer empowerment (Pires *et al.*, 2006; DiFilippo *et al.*, 2015). These technologies give consumers easy access to a lot of information about food, its composition, and its origin (Adamski *et al.*, 2020). Consumers can also compare prices, opinions of other consumers, and nutritional information by having direct access to a wide range of alternatives (Davies and Elliott, 2006).

In addition, the boom of social media and nutrition apps has greatly expanded the scope of consumer information about food and contributed to the emergence of new practices of sharing culinary and nutritional information that has led to changes in attitudes, behaviors and food culture (Lee *et al.*, 2014).

These new forms of interaction promote the creation and sharing of information within virtual networks and communities, and therefore strengthen the power of consumers in their relationships with brands (Labrecque *et al.*, 2013).

According to several researchers (Wathieu *et al.*, 2002; Harrison *et al.*, 2006), the rise of technology and the Internet has given consumers more control over their purchasing and consumption decisions. This shift in power has resulted in the transformation of the balance of power in favour of consumers (Kucuk and Krishnamurthy, 2007).

Thanks to the information provided by digital devices, consumers no longer accept the role of

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passive consumers but are increasingly empowered and seek equal relationships with brands (Rual, 2019). They are no longer passive consumers who are unaware of their consumption; instead, they want to play an active role in their consumption and dietary choices, and they have become "consum-actors" or more precisely, "empowered" consumers (Fayn *et al.*, 2019).

Therefore, consumer empowerment in food refers to the process by which consumers acquire the knowledge, skills and tools to make wise and autonomous food choices that empower them in their decision-making process (Nam, 2019).

This study aims to answer the following research question: To what extent does the use of Internet and web technologies influence consumers' power over food and their psychological empowerment in food choices? To answer this question, we propose the following plan: a literature review that includes the main theories related to the research question, then a research methodology appropriate to the research question, data analysis, discussion of the results, and finally theoretical and economic implications, accompanied by limitations and new research avenues.

2. Literature review

2.1. *Internet use and the psychological empowerment of consumers*

Rappaport and Zimmerman's empowerment theory is a theoretical model that focuses on the process by which individuals and communities gain and retain power, control and influence over their lives and environments (Rappaport, 1987; Zimmerman, 1995). This theory is introduced to examine the impact of the use of the Internet and web technologies on consumers' power over food and thus on their psychological empowerment in making food decisions.

In marketing, the concept of consumer empowerment accompanies the rise of the Internet: it refers to the consumer's gain in skills, autonomy, and control (Wathieu *et al.*, 2002; Davies and Elliott, 2006). Some authors see empowerment as a psychological state of gaining power through the use of the Internet (Wright *et al.*, 2006; Davies and Elliott, 2006). Other authors, however, see empowerment as a process of delegation of power that is voluntarily initiated by a company in the context of co-creation activities (Füller *et al.*, 2009). Both concepts, psychological empowerment on one hand, and empowerment strategy on the other, share the idea of gaining skills, but differ greatly in their scope of application (Pruche, 2015). Therefore, empowerment can arise from the customer's initiative in using digital technology, but also from the actions of brands and other actors (Cases, 2017).

The approach used in this study is referred to as the "psychological approach," which focuses on the extent to which individuals or consumers actually experience a sense of empowerment based on their individual perceptions of self-awareness, self-determination, and self-efficacy in their food decision-making (Ben Ayed and El Aoud, 2016).

Referring to the conceptualization of (Ben Ayed and El Aoud, 2016), psychological empowerment of the consumer in the domain of food is associated with three dimensions:

Self-awareness: This refers to the consumer's ability to be aware of their food preferences, beliefs and values (Ben Ayed and El Aoud, 2016). This ability enables the consumer to better understand their food choices and make more conscious decisions (Nam, 2019).

Self-determination: This refers to the consumer's ability to make autonomous food choices based on their own values and preferences (Ben Ayed and El Aoud, 2016). This ability allows consumers to take control of their food choices and feel more confident in their decisions (Nam, 2019).

Self-efficacy: This refers to the consumer's ability to apply their knowledge and skills in relation to food, as well as their ability to deal with the obstacles and challenges they may encounter (Ben Ayed and El Aoud, 2016). This competence enables the consumer to feel competent and capable of making healthy food choices and maintaining healthy eating behavior in the long term (Nam, 2019).

According to Pitt *et al.* (2002); Davies and Elliott (2006), the use of the Internet and digital technology is the most important source of consumer empowerment. Indeed, the literature review revealed that the idea that the use of the

Internet and web technology has an "empowering effect" on consumers has long been held in the literature, especially since the introduction of the Internet in the 1990s (Pitt *et al.*, 2002; Davies and Elliott, 2006; Harrison *et al.*, 2006; Kucuk and Krishnamurthy, 2007). In general, empowered consumers are able to make appropriate choices from a range of goods and/or services (Harrison *et al.*, 2006). A consumer who uses the Internet to learn about the nutritional values of the products he consumes contributes to the development of a sense of individual or psychological empowerment (Wright *et al.*, 2006). This developed competence makes the consumer more autonomous in his decision-making process (Pruche, 2015).

As confirmed by (Nam, 2019), consumer empowerment in the food sector is a process that enables consumers to make more informed and autonomous decisions about their food choices. Indeed, the Internet has long been seen by various experts as one of the ways in which individuals can take responsibility for their health (Lemire *et al.*, 2007; Hardey, 2001).

Some authors believe that the use of the Internet would encourage users to take responsibility for their own health through their food choices (Hardey, 2001). This technological use can encourage consumers to adopt healthier food choices and take measures to prevent chronic diet-related diseases through direct access to a wide range of health and nutrition information provided by the Internet (Banti *et al.*, 2016). Consequently, this empowerment effect reinforced by successive developments in digital technologies (Labrecque *et al.*, 2013) gives rise to a self-aware consumer in his consumption, self-effective in his choices, and self-determined in his food decisions (Nam, 2019; Ben Ayed and El Aoud, 2016). A strong relationship is therefore observed between the use of the Internet and web technologies and the psychological empowerment of consumers in their food decision-making. Hence, the following hypothesis is retained:

H1: The use of the Internet and web technology positively impacts the psychological empowerment of consumers in their food decision-making.

2.2. *The use of the Internet and the power of the consumer*

The focus has been placed on French *et al.*'s (1959) theory of sources of power to understand the antecedents of psychological empowerment. This theoretical framework is particularly fundamental to clearly understand the impact of the Internet and web technologies on consumer power. The theory has been used several times in conceptual work in marketing to assess consumer (perceived) power (Rucker and Galinsky, 2008), specifically in the context of purchase decisions (Rezabakhsh *et al.*, 2006).

Indeed, some authors explicitly rely on the power theory of (French *et al.*, 1959) to justify the thesis that the use of the Internet would favor a gain in consumer power (Rezabakhsh *et al.*, 2006; Moati, 2009).

French *et al.* (1959) identified five sources of power: reward power, coercive power, legitimate power, referent power, and finally, expert power. The theory of power sources by French *et al.* (1959) has been put into practice in marketing to particularly clarify the impact of the Internet and web technologies on the power of the consumers in their purchasing decisions (Harrison *et al.*, 2006). Three sources of power are appropriate for explaining consumer power in the sphere of commercial relationships, starting with expert power, followed by voice power (including reward power and coercive power) and finally legitimate power (Pruche, 2015). This study focuses on three sources of power (French *et al.*, 1959) perceived through the use of the Internet and web technology in the context of a purchase decision (Rezabakhsh *et al.*, 2006).

The power of expertise is a power derived from a person's knowledge or expertise in a particular field (French *et al.*, 1959). It refers to an individual's ability to influence others due to their knowledge or expertise in a particular field and varies depending on the degree of expertise that P attributes to O in a given domain (Pruche, 2015).

Pitt *et al.* (2002) have shown that the use of the Internet and web technologies would in-

crease consumer power by helping to reduce information asymmetry in market relations between producers and consumers.

In the context of food, consumer expert power refers to the consumer's ability to use available online information to make informed food decisions (Banti *et al.*, 2016). Consumers can access a large amount of information online, including product reviews and nutritional evaluations (Pollard *et al.*, 2015). By using this information, consumers can become experts in their own food choices, able to select the foods that best fit their dietary needs and preferences (Nam, 2019).

As (Li *et al.*, 2022) confirmed, consumers today have a growing food expertise, and are increasingly aware of food safety issues, sustainability and the environmental impact of food production, and expect food products to meet these criteria.

As noted by (Rezabakhsh *et al.*, 2006), before the Internet, consumers lacked 'expert power' due to information asymmetries since brands deliberately withheld information. However, web technologies have enabled consumers to search and compare nutritional information on different foods, allowing them to make more rational food choices (Pires *et al.*, 2006). The spread of the Internet has helped to reduce information asymmetries and improve market transparency for consumers (Grewal *et al.*, 2003). Therefore, the following hypothesis, which posits a strong relationship between Internet use and expert power in the field of food information, is retained:

H1a: The use of the Internet and web technology positively impacts consumers' expertise power over food.

The power of the voice, which includes both reward and coercive power, is strengthened by the Internet (Pruch, 2015). This is because it allows communication and dissemination of positive and/or negative opinions to a wider audience, as well as the ability to reward or punish a brand (Labrecque *et al.*, 2013).

The power of reward refers to one person's ability to reward another for their actions or behavior (French *et al.*, 1959). In the context of food brands, consumers can exercise their power of reward by purchasing products from a particular brand via electronic word-of-mouth on the Internet (eBAO) (Hennig-Thurau *et al.*, 2004). However, the digital age has provided consumers with unprecedented access to nutrition information, enabling them to develop their relational skills by sharing their opinions and preferences with other consumers (Pruch, 2015).

Coercive power is the ability of a person to punish in order to achieve a desired behavior (French *et al.*, 1959). In the context of the brand-consumer relationship, consumers can exercise their power by choosing not to buy a product (coercive power), using their expertise to evaluate the quality of that product (expert power) (Pruche, 2015). Thus, if consumers are satisfied with the product quality of a food brand, they may decide to reward it by buying more products from that brand. If, on the other hand, consumers are dissatisfied with the quality of that food brand, they may decide not to buy more products from that brand (Hirschman, 1970).

As a result, through the opportunities offered by these technologies, consumers may reward or sanction the brand by accepting a loyalty reward and/or negative sanctions such as 'exit' and 'voice' (Hirschman, 1970). Therefore, a strong relationship is observed between Internet use and consumer voice. Hence, the following hypothesis is proposed:

H1b: Internet use and web technology have a positive impact on consumer voice in food.

Legitimate power is the power derived from a person's status or hierarchical position (French *et al.*, 1959). The Internet would give legitimate power to the customer by challenging the traditional division of roles within the business relationship between producer and consumer (Moati, 2009).

The producer traditionally determines the characteristics of the product and is perceived as legitimate for doing so (Pruche, 2015). The consumer's decisions are mainly about whether or not to buy the product, but not about the definition of the product itself (Hirschman, 1970). However, with the advent of the Internet, consumers can participate in the co-creation of products with brands, reversing the

balance of power between brands and consumers and rebalancing exchange relationships (Fayn *et al.*, 2019). This collaborative approach allows brands to have an open dialogue with consumers about food ingredients (Belharar and Chakor, 2022) and involve their customers or consumers more in the product development process, while giving consumers a sense of involvement and satisfaction in their shopping experience (Fernandes and Remelhe, 2016).

The brand « c'est qui le patron ? » is an example of empowerment campaigns that involve consumers in the development of healthy, responsible and ethical products and give them a sense of participation (Renault, 2019).

Consumers can influence the practices of food brands by exercising their decision-making power through information available online and helping to promote more sustainable and ethical practices in the food sector (Levkoe and Blay-Palmer, 2018). By exerting social pressure on brands, consumers can promote more sustainable and ethical practices that respect farmers and animals and ensure transparency of ingredients and production methods (Sen and Bhattacharya, 2001). There is thus a strong link between Internet use and consumers' legitimate power over food. This leads to the following hypothesis:

H1c: Internet use and web technology have a positive impact on consumers' legitimate power over food.

Consequently, empowering consumers in terms of their expertise, voice and legitimacy can help them to have a greater say in food decisions, i.e. make healthy food choices and improve public health in general (Wang *et al.*, 2020). These authors argue that feelings of power can influence food choices in two ways: by influencing perceptions of the relevance of food choices and by influencing perceptions of the ability to make healthy food choices, i.e. a psychological state of empowerment in food decisions (Wang *et al.*, 2020).

These three sources of perceived power through the use of the Internet and web technologies promote, thus the emergence of an "empowered" consumer (Pruche, 2015). Similarly, consumers' power over food contributes to their psychological empowerment and their ability to make rational decisions that can influence their perception of food risks and their satisfaction with their food consumption (Nam, 2019).

As Pruche (2015) notes, variation in any of these three sources of power – expert power, voice power and legitimate power – should lead to variation in the same direction of the consumer's perceived sense of power or psychological empowerment. In relation to this topic, variations in each of these three sources of power – expert power, voice power and consumer legitimate power in relation to food – should lead to variation in the same direction of consumers' perceived sense of power or psychological empowerment in their decisions about food (Pruche, 2015). In other words, expert power, voice power and consumers' legitimate power in relation to food are antecedents to consumers' psychological empowerment in food decisions, according to (Pruche, 2015; Nam, 2019; Wang *et al.*, 2020). Thus, a positive relationship is found between expert power, voice power and legitimate power in food issues and the general psychological empowerment of consumers in their food choices. Therefore, the following hypotheses are retained:

H1d: The expert power of consumers in food matters positively impacts their psychological empowerment in their food choices.

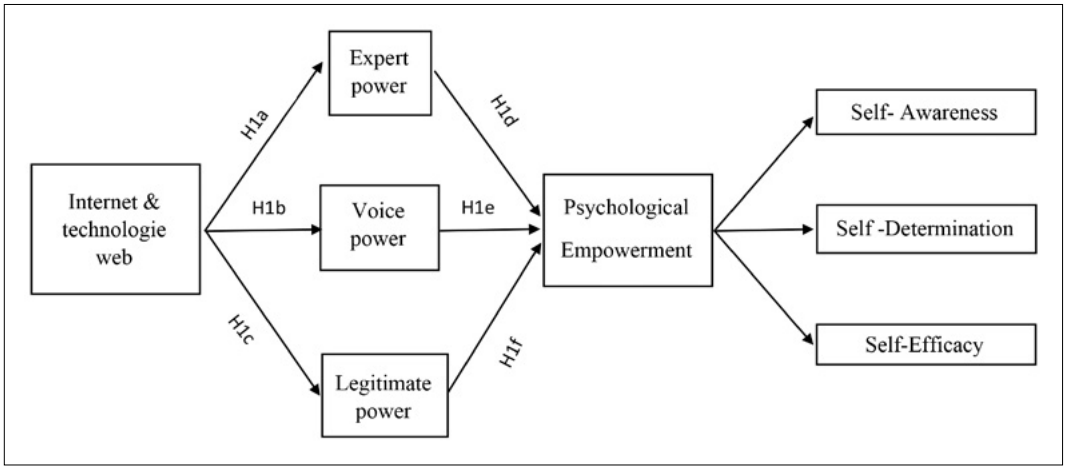
H1e: The voice power of consumers in food matters positively impacts their psychological empowerment in their food choices.

H1f: The legitimate power of consumers in food matters positively impacts their psychological empowerment in their food choices.

2.3. *Aim and hypothesis*

The aim of this article is to answer the following research question: To what extent does the use of the Internet and web technologies influences consumers' power over food and, consequently, their psychological empowerment in food choices? The results of the literature review have made it possible to create

Figure 1 - Theoretical model.



a conceptual model with all the research hypotheses, which is shown in Figure 1.

3. Research methodology

The authors aim to evaluate how the Internet and web technologies impact consumers' power over food and their psychological empowerment in food choices. They collect data using a quantitative approach and a questionnaire, following Thiétart's (2007) method for data collection. Using the Google Form platform, they collect questionnaires over three months (May-July 2021). Results are obtained by testing a series of hypotheses based on a conceptual model derived from the literature review.

3.1. *The participants*

The selection of participants was carried out through convenience sampling, which involves selecting participants based on their availability, accessibility, or willingness to participate in the survey. The sample size for this study is calculated using the Cochran formula, as this formula is often used when using convenience sampling to minimize sampling errors and biases in survey results.

Therefore, the sample size is calculated based on the following data: a confidence level (z) of 1.96, an estimated proportion (p) of 0.5, and a tolerated margin of error (e) of 0.06.

$$n = \frac{z^2 pq}{e^2} = \frac{1.96^2 * 0.5(1-0.5)}{0.06^2} = 267\ person$$

The study sample includes 300 Moroccan participants, which exceeds the minimum number required.

3.2. *Operationalisation of variables*

The model variables include a dichotomous variable and continuous variables. A dichotomous measure (yes or no) was used to measure Internet and web technology use, and a five-point Likert scale was used to measure the continuous variables of the research model (Annexe 1).

The power variable consists of three power variables – expert power, voice power, and legitimate power. These were developed by French *et al.* (1959) and Swasy (1979) based on the theory of sources of power. Each variable is composed of several items. Expert power has three items, voice power has three items, and legitimate power has two items. The items used in a study of food purchasing decisions were adapted from those used by (Pruche, 2015) in a study of travel purchasing decisions.

The psychological empowerment variable: authors (Ben Ayed and El Aoud, 2016) proposed a scale to measure the psychological empowerment of health-conscious patients, which was adapted for this study because its dimensions seem relevant to consumers who have become

health-conscious through their diet. Psychological empowerment includes three dimensions: self-awareness, self-determination, and self-efficacy, each measured by 5 items (self-awareness), 3 items (self-determination), and 4 items (self-efficacy). Spreitzer (1995) has theoretically confirmed the existence of a second-order factor (empowerment) composed of these three first-order factors, but this still needs to be statistically confirmed by a confirmatory factor analysis.

3.3. *Data analysis*

The authors analysed the demographic profiles of the respondents using descriptive statistics. Since their research model contained 6 continuous variables, namely: expert power, voice power, legitimacy power, self-awareness, self-determination and self-efficacy, they used principal component analysis (PCA) to reduce dimensionality, identify important variables, detect relationships between variables, and strengthen Ben Ayed and El Aoud's (2016) measurement scale. They then conducted confirmatory factor analysis (CFA) to test the research model and assess relationships between variables.

The authors tested their model using the PLS-SEM method and evaluated the measurement and structural models using various indices. They also analyzed the demographic profiles of the respondents, reduced the data with SPSS v23, and evaluated the external measurement and internal structural models using SMARTPLS.

4. Descriptive statistics

Demographic profile of respondents

Of the 300 respondents, 85 were men (32.7%) and 215 were women (67.3%) whose ages ranged from 18 to over 65, with the majority between 25 and 35. In terms of occupation, 35% of respondents were students, 22.3% were employees, 24% were civil servants, 7% were entrepreneurs and 4.3% were self-employed. Regarding income, 34% of the respondents had no salary, while the remaining 62% had an income ranging from less than 5000 DH to over 30000 DH. The majority of respondents have an educational level ranging from bachelor's degree to doctorate. In addition, 94% of the respondents said that they checked the nutritional values on the Internet before buying a food product, while 5% did not (Table 1).

Table 1 - Demographic profile of respondents.

The use of the Internet to search for information		
Internet use	*Frequency*	*Pourcentage*
Yes	285	95%
No	15	5%
Total	300	100%
Percentage of consumers by gender		
Female	215	67.3%
Male	85	32.7%
Total	300	100%
Socio-professional category of consumers		
Student	105	35%
Employee	67	22.3%
A civil servent	72	24%
Entrepreneur	21	7%
Self-employed	13	4.3%
Other	22	17.3%
Total	300	100%
Consumers' income		
No salary	102	34%
Less than 5000DH	31	10.3%
5000-10000 DH	64	21.3%
10000-20000 DH	51	17%
20000-30000 DH	16	5.3%
More than 30,000 DH	24	8%
Total respondents	288	96%
No response	12	4%
Total	300	100%
Age		
Less than 25 years old	94	31,3
25-35 years old	95	31,7
46 -55 years old	72	24,0
56-65 years old	32	10,7
More than 65 years old	7	2,3
Total	300	100,0
Level of education		
Bachelor's degree	16	5,3
2-year university degree	56	18,7
3 or 4-year university degree	90	30,0
5-year university degree	100	33,3
8-year university degree	38	12,7
Total	300	100,0

Source: data (SPSS output).

Table 2 - Principal component analysis.

Measured variables	*Scales used*	*Items*	*Number of items retained*	*Relative contribution*	*The total variance explained*	*Alpha Cronbach*
Expert power (EP)	French *et al.*, 1959; Swasy, 1979; Pruche, 2015	*EP1*: I am better positioned to make a good choice among the available food offers	3	0.864	71.990	0.804
		EP2: I have all the information I need to make an informed purchase		0.855		
		EP3: I feel capable of choosing my consumption.		0.825		
Voice power (VP)	French *et al.*, 1959; Swasy, 1979; Pruche, 2015	*VP1*: It has become easy for me to share reviews with consumers	2	0.882	77.751	0.714
		VP2: I know that I can raise my voice whether I am satisfied with my consumption or not		0.882		
		VP3: The opinion of the consumer has become important for the producer		0.675		
Legitimate power (LP)	French *et al.*, 1959; Swasy, 1979; Pruche, 2015	*LP1*: I can influence consumers through the products I consume	2	0.850	72.245	0.610
		LP2: I have the ability to adjust the ingredients of the product if the brand allows it.		0.850		
Self-Awareness (Awars)	Ben Ayed & El Aoud, 2016)	*Awars1*: I think I am the person who knows best about his or her health status and needs	5	0.752	60.685	0.838
		Awars2: I am aware of situations and experiences that can have a negative influence on my decisions		0.785		
		Awars3: I know where to find information to take care of my consumption		0.785		
		Awars4: I know how to take care of my health by being mindful of what I consume.		0.775		
		Awars5: I am very concerned about my health: (choice of food, products, their composition, etc.)		0.797		
Self-Determination (Det)	Ben Ayed & El Aoud, 2016	*Det1*: I have control over myself and know what is good for my health	3	0.894	76.430	0.846
		Det2: I show independence and responsibility for myself.		0.886		
		Det3: I can choose healthy eating goals		0.842		
Self-Efficacy (EffI)	Ben Ayed & El Aoud, 2016	*Effi1*: I can choose my consumption according to my nutritional goals	4	0.802	66.634	0.831
		Effi2: I am able to understand the difficulties that arise in my consumption decisions		0.800		
		Effi3: I am able to decide which way is the best for me to reach my nutritional goals		0.847		
		Effi4: I believe that I can sustain a long-term dietary change		0.815		

Source: data (SPSS output).

5. Principal component analysis (PCA)

The results in Table 2 indicate that for all research model variables (expert power, legitimate power, self-awareness, self-determination, and self-efficacy), the relative contribution is higher than the norm (0.7) for the majority of items. The information retained after Varimax rotation exceeds the norm, which recommends a value greater than 50%. In terms of construct reliability, the Cronbach's alpha coefficient is also higher than the norm, which recommends a value greater than 0.7, or even 0.6. With the exception of the third item "Voice Power," which lacks sufficient representativeness, all other items are retained. This exclusion improves the analysis efficiency.

6. Confirmatory analysis (CFA)

6.1. *The measurement model*

Internal consistency reliability

Internal consistency reliability is assessed using two criteria: Cronbach's alpha and composite reliability (Chin, 1998). These values generally range from 0 to 1. Values that are often considered to indicate a good level of reliability are 0.7 (Tenenhaus *et al.*, 2005).

In general, the results collected in Table 3 show that the criteria required to ensure the reliability of the internal consistency of all variables in the measurement model are met according to the evaluation criteria used in the literature.

Convergent validity

Convergent validity relies on examining and evaluating the correlations between indicators and their latent variable, as well as the average variance extracted. To be considered valid, a measurement scale must have correlation coefficients greater than 0.7 (which assumes that the latent variable shares more variation with its indicators than error variance) (Fernandes, 2012) and an AVE greater than 0.50 (Fornell and Larcker, 1981).

The results in Table 4 indicate that all items composing the variables in the model have factor contributions above the recommended threshold of 0.7 (Fernandes, 2012). Additionally, the examination of the average variance extracted from all variables shows a value above the recommended threshold of 0.5 (Fornell and Larcker, 1981). Therefore, the results demonstrate that the criteria for ensuring convergent validity of the measures associated with the constructs have been met, as assessed by factor contributions and average variance extracted.

The results of Table 5 for the second-order variable 'psychological empowerment' are significant, as indicated by the Cronbach's alpha value of 0.844, which is higher than the recommended norm of >0.7, the composite reliability value of 0.883, which is also higher than the norm of >0.7, and an AVE value of 0.520, which exceeds the norm of >=0.5. In fact, the loadings of the first-order latent variables on those of the second order (empowerment) are all >0.5 and significant. Therefore, the second-order model

Table 3 - Internal consistency reliability.

Variables	*Alpha de Cronbach*	*P-value*	*Criteria*	*Results*	*Composite reliability*	*P-value*	*Criteria*	*Results*
Expert power	0.805	0.000	> 0.7	Reliable	0.885	0.000	> 0.7	Reliable
Voice power	0.616	0.000			0.838	0.000		
Legitimate power	0.714	0.000			0.875	0.000		
Self-Awareness	0.838	0.000			0.885	0.000		
Self-Dermination	0.845	0.000			0.907	0.000		
Self-Efficay	0.833	0.000			0.888	0.000		

Source: data (SMART PLS outputs).

Table 4 - Convergent validity.

Variables	*Outer Loading*	*Criteria*	*AVE*	*Criteria*
EP1 <=EP	0.864	>0.7	0.720	>=0.5
EP1<=Empowerment	0.774			
EP2 <- EP	0.855			
EP2 <- Empowerment	0.788			
EP3 <- EP	0.826			
EP3 <- Empowerment	0.748			
LP1 <-=LP	0.877			
LP1<=Empowerment	0.702			
LP2 <=LP	0.820		0.721	
LP2 <=Empowerment	0.820			
VP1 <=Empowerment	0.727		0.777	
VP2 <=Empowerment	0.701			
VP1 <= VP	0.887			
VP2 <=VP	0.876			
Awars1<= Self-Awareness	0.750		0.606	
Awars2<= Self-Awareness	0.778			
Awars3<= Self-Awareness	0.804			
Awars4 <= Self-Awareness	0.769			
Awars5<=Self- Awareness	0.790			
Det1 <= Self-Determination	0.891			
Det2 <= Self –Determination	0.882		0.764	
Det3<=Self-Determination	0.849			
Effi1 <= Self-Efficacy	0.800			
Effi2 <=Self- Efficacy	0.792			
Effi3 <=Self- Efficacy	0.839		0.666	
Effi4 <=Self-Efficacy	0.831			

Source: data (SMART PLS outputs).

Table 5 - Convergent validity and internal consistency reliability of the second-order structure of the empowerment variable.

Variables		*Convergent validity*	*Reliability*	
Variable of order 2	*Variable of order 1*	*AVE*	*Alpha cronbach*	*Composite reability*
Empowerment	Self-awarness	0.520	0.844	0.883
	Self dermination			
	Self-efficacy			

Source: data (SMART PLS outputs).

of empowerment fits the data well. Thus, the second-order construct of psychological empowerment, as well as its reliability and convergent validity, are confirmed.

Discriminant validity

Two tests to assess the discriminant validity of a construct, namely the discriminant validity test of Fornell and Larcker (1981) and the discriminant validity test of Lacroux (2009). The first test uses the average variance extracted (AVE) to measure the variance shared between a construct and its measured variables, while the second test uses the cross-loading test to test whether the indicators measuring a latent variable are more strongly correlated with that variable than with the other latent variables in the model.

The results of the Tables 6-7 of the discriminant validity test show that the criteria for establishing discriminant validity (assessed by examining the correlations between the constructs and the cross-loadings) are consistent with the recommendations of Lacroux (2009); Fornell and Larcker (1981).

Table 6 - Discriminant validity (Fornell and Larcker, 1981).

	Awars	*EP*	*VP*	*LP*	*Det*	*Effi*	*AVE*	*SQRT AVE*
EP	0.608	1	0.597	0.529	0.548	0.578	0.720	0.848
VP	0.500	0.597	1	0.485	0.434	0.474	0.777	0.881
LP	0.556	0.529	0.485	1	0.465	0.488	0.721	0.849
Det	0.763	0.548	0.434	0.465	1	0.794	0.764	0.874
Effi	0.764	0.578	0.474	0.488	0.794	1	0.666	0.816
Awars	1	0.608	0.500	0.556	0.763	0.764	0.606	0.778

Table 7 - Discriminant validity (Cross loading test) (Lacroux, 2009).

	Awars	*Det*	*Eff*	*EP*	*LP*	*VP*	*IU*
Awars1	**0.750**	0.592	0.565	0.481	0.460	0.333	0.130
Awars2	**0.778**	0.501	0.542	0.427	0.439	0.384	0.014
Awars3	**0.804**	0.562	0.612	0.582	0.490	0.451	0.081
Awars4	**0.769**	0.646	0.637	0.438	0.374	0.397	0.035
Awars5	**0.790**	0.676	0.631	0.443	0.415	0.380	0.108
Det1	0.700	**0.891**	0.701	0.498	0.409	0.370	0.012
Det2	0.621	**0.882**	0.659	0.459	0.408	0.392	-0.028
Det3	0.674	**0.849**	0.729	0.481	0.431	0.376	0.087
Effi1	0.649	0.684	**0.800**	0.459	0.351	0.409	0.095
Effi2	0.558	0.576	**0.792**	0.429	0.383	0.371	0.133
Effi3	0.604	0.655	**0.839**	0.449	0.406	0.384	0.070
Effi4	0.683	0.681	**0.831**	0.551	0.463	0.387	0.163
EP1	0.542	0.496	0.532	**0.864**	0.438	0.506	0.184
EP2	0.516	0.416	0.434	**0.855**	0.468	0.542	0.084
EP3	0.507	0.486	0.517	**0.826**	0.450	0.470	0.158
LP1	0.517	0.500	0.463	0.499	**0.877**	0.477	0.063
LP 2	0.435	0.292	0.371	0.400	**0.820**	0.348	0.061
VP1	0.456	0.389	0.441	0.535	0.453	**0.887**	0.115
VP2	0.429	0.376	0.396	0.517	0.412	**0.876**	0.072
IU	0.095	0.027	0.143	0.167	0.073	0.106	**1.000**

Source: data (SMART PLS outputs).

6.2. *The structural model*

Coefficient of determination (R^2)

The R^2 allows an understanding of the contribution of each explanatory variable to the prediction of the dependent variable. Three different thresholds of the multiple R^2 can be considered: if the R^2 value is greater than 0.1, the model is considered significant; if it falls between 0.05 and 0.1, the model is considered marginal; if it is less than 0.05, then the model is considered not significant (Croutsche, 2002).

The results in Table 8 show that all R^2 values for all endogenous latent variables are greater than 0.1, confirming the significance of the model, with the exception of expert power, voice power and legitimate power, which do not have strong explanatory power in the research model.

Stone-Geisser coefficient (Q^2)

The Stone-Geisser Q^2 coefficient is used to evaluate the quality of any structural equation. If the value of Q^2 is positive, the model has good predictive validity, and if the value of Q^2 is negative, the model has poor predictive validity (Tenenhaus *et al.*, 2005).

The results in Table 9 show that all Q^2 values are positive, indicating that the model has good predictive validity.

Table 8 - R-square of the endogenous latent variables.

Constructs	*R^2*	*Result*
Self –Awareness	0.456	Significant
Self-Determination	0.347	Significant
Self-Efficay	0.393	Significant
Empowerment	1	Significant
Expert power	0.025	Not significant
Legitimate power	0.002	Not significant
Voice power	0.008	Not significant

Source: data (Smart PLS outputs).

Effect size f^2

Effect size indicates the relative effect of a given exogenous latent variable on the endogenous latent variable by using the variations in the coefficient of determination (R^2) (Chin, 1998).

The effect size can be expressed with the following formula (Cohen,1988):

$$f^2 = \frac{R^2_{inclue} - R^2_{exclue}}{1 - R^2_{inclue}}$$

The results in Table 10 show that, based on the recommendations of Cohen (1988), the effect size for all relationships between latent variables in the model is characterized by a large effect $f^2 > 0.35$. Generally, the results indicate that the independent variables in the model have a significant

Table 9 - Cross-validation redundancy indices.

Variables	*SSO*	*SSE*	*Q^2 (=1-SSE/SSO)*
Self-Awarness	1500.000	1094.892	0.270
Self-Determination	900.000	663.607	0.263
Self-Efficacy	1200.000	890.078	0.258
Empowerment	2100.000	1022.662	0.513
Expert power	900.000	885.736	0.016
Legitimate power	600.000	598.630	0.002
Voice power	600.000	597.209	0.005
IU	300.000	300.000	

Source: data (SMART PLS outputs).

Table 10 - F-square of the endogenous latent variables.

Constructs	*f^2*	*Result*
Expert power->Empowerment	3779.469	Large
Voice power-> Empowerment	1504.418	Large
Legitimate power->Empowerment	1449.695	Large

Source: data (SMART PLS outputs).

Table 11 - Goodness-of-Fit (GoF).

Constructs	*R²*	*Average of R²*	*AVE*	*Average of AVE*	*GoF Index*
Self-Awarsness	0.456	0,318714	0.60	0,681142	0,465928
Self-Determination	0.347		0.764		
Self-Efficacy	0.393		0.666		
Expert power Voice power	0.025 0.008		0.720 0.777		
Legitmate power	0.002		0.721		
Empowerment	1		0.520		

Source: data (SMART PLS outputs).

Table 12 - Test of research model hypotheses.

Hypotheses	*Relation*	*Original Sample*	*Sample Mean*	*Standard Deviation*	*T Statistics*	*P Values*	*Validity*
H1-a	IU -> EP	0.167	0.164	0.059	2.835	0,005	Accepted
H1-b	IU -> VP	0.106	0.113	0.063	1.678	0,094	Accepted
H1-c	IU -> LP	0.073	0.082	0.063	1.161	0,246	Rejected
H1-d	EP->EMP	0.544	0.544	0.022	25.124	0,000	Accepted
H1-e	VP->EMP	0.333	0.333	0.016	18.941	0,000	Accepted
H1-f	LP->EMP	0.310	0.309	0.017	18.803	0,000	Accepted

Source: data (SMART PLS outputs).

impact on the dependent variables, which is considered particularly important and significant.

Goodness-of-Fit (GoF)

The GoF fit index is a general validation index for the PLS model. GoF values of 0.10, 0.25 and 0.36 were classified as very low, medium and high (Wetzels *et al.*, 2009). The formula for calculating the GoF is as follows:

$$\mathrm{GoF} = \sqrt{\overline{\mathrm{R^2}} * \overline{\mathrm{AVE}}}$$

The results in Table 11 show that the Goodness of Fit (GoF) for this study is 0.465. In agreement with the values reported by Wetzels *et al.* (2009), these results indicate a strong overall quality of the model. This means that the PLS model fits the observed data well and can be used to make accurate predictions.

Hypothesis testing

Table 12 shows the results of the hypothesis test of the research model using the bootstrapping method and selecting 500 replicate samples, as recommended by Chin (1998).

7. Results and discussion

The aim of this study is to provide a theoretical understanding and empirical investigation of the impact of the use of Internet and web technologies on consumers' power over food, and consequently, on their psychological empowerment in food choices. To achieve this goal, power and empowerment theory were used as a theoretical framework to analyze the consumer empowerment phenomenon in food.

The results in Table 12 confirm a positive and significant relationship between the use of Internet and web technologies and consumers' expert power over food (p-value = 0.005). These results are consistent with previous research by Pitt *et al.* (2002), Nam (2019) and Li *et al.* (2022), which improve significantly the understanding of the impact of Internet use on consumers' information power. That is, consumers who use the Internet have increased their expert power (Pitt *et al.*, 2002), especially in the area of food (Nam, 2019). With access to a large amount of information about food, consumers can learn

about the nutritional properties of the foods they consume and understand how these foods affect their health (Li *et al.*, 2022).

The second hypothesis (H1b) was confirmed as there is a significant relationship between Internet use and consumer voice on food issues (p-value = 0.094). These results are consistent with previous research by Labrecque *et al.* (2013); Hennig-Thurau *et al.* (2004); Pruche (2015) and Hirschman (1970), who discuss the importance of the impact of Internet use on consumer voice in the producer-consumer relationship, i.e. consumers can exercise their power of reward and coercion based on the information they find (Labrecque *et al.*, 2013; Pruche, 2015).

Labrecque *et al.* (2013) and Pruche (2015) point out that consumers can exercise their power of reward or coercion depending on the information they find. For example, if a consumer finds harmful ingredients in a product, they may choose not to buy it, while if they find healthy ingredients, they may choose to buy it (Hirschman, 1970). Access to nutrition information on the Internet has empowered the voice of consumers, enabling them to make informed choices about their diet and exercise their power over reward and coercion accordingly (Hennig-Thurau *et al.*, 2004).

The third hypothesis (H1c) was rejected because the relationship between Internet use and legitimate power over food was not significant (p-value = 0.246). These results are contradictory to previous studies that examined the impact of Internet use on consumers' legitimate power over food (Levkoe and Blay-Palmer, 2018; Moati, 2009; Fayn *et al.*, 2019). This contradiction means that consumers do not feel that they are legitimate decision-makers on food issues, which means that they have not yet strengthened their legitimate power in this area. Nutrition experts and food companies are more likely to be seen as legitimate decision-makers on nutrition issues. However, using the Internet to learn about nutrition can be seen as a step towards strengthening their power.

The fourth hypothesis (H1d) was confirmed as the relationship between expert power and consumer psychological empowerment in food was significant (p-value = 0.000). These results are consistent with previous research by Pruche (2015); Wang *et al*. (2020) and Nam (2019), suggesting a positive relationship between consumers' expert power in food and their psychological empowerment. That is, greater access to information enables consumers to acquire expert knowledge about food, which enables them to make more informed and responsible decisions about what they buy and consume (Wang *et al*., 2020). This expert knowledge also gives them a sense of autonomy and control over their food, strengthening their self-determination in food choices and their role in the food market (Nam, 2019).

The fifth hypothesis (H1e) was confirmed as the relationship between voice power and psychological empowerment was significant (p-value = 0.000). These results are consistent with previous research by Pruche (2015), Wang *et al.* (2020) and Nam (2019) suggesting a positive relationship between consumers' voice power in food and their psychological empowerment in food choices. This means that consumers have gained reward and coercive power over food through the Internet. Namely, they can express either their satisfaction, or dissatisfaction regarding food through online comments, social media reviews and blogs. This reward and coercion power strengthens their decision-making power over food; as food companies have an incentive to respond to consumers' demands in order to retain their customer base (Wang *et al.*, 2020). Consumers are thus able to influence companies' food practices by using their power of reward and coercion via the Internet, which strengthens their decision-making power over their food choices (Nam, 2019).

The sixth hypothesis (H1f) was confirmed as the relationship between legitimate power over food and consumers' psychological empowerment in their food choices was significant (p-value = 0.000). These results are consistent with previous research by Pruche (2015), Nam (2019), and Wang *et al.* (2020) suggesting a positive relationship between legitimate power over food and consumers' psychological empowerment in their food choices. That is, consumers' legitimate power over food enhances their agency in making food choices (Wang *et al.*, 2020). Consumers have increasing choices about food and can influence the practices of food companies through

their purchasing power and collective voice. When consumers have the opportunity to influence food industry practices, it can strengthen their sense of power and influence (Nam, 2019).

8. Conclusion

This study shows that the use of the Internet has a significant impact on consumers' power over food, as they have access to a large amount of information about food products. This allows consumers to increase their expert power and make more rational decisions based on their needs and values. They can also exercise their coercive power by boycotting products or companies that do not meet their expectations and their reward power by promoting those that do. Despite these advances, however, consumers still do not have legitimate power over food, and accountability campaigns as the « c'est qui le patron ? » brand, which aims to make them aware of the impact of their choices on the food chain.

To sum up, the information available through the Internet and technology enables consumers to make informed decisions about food, provides them with knowledge and a platform to voice their opinions, and represents a crucial first step towards obtaining genuine control over the food industry. Ultimately, consumer empowerment has a positive impact by prompting the food industry to increase transparency, accountability, and responsiveness to consumer needs and expectations.

Theoretical contributions

Theoretical contribution of this study is focused on empowerment theory to investigate the phenomenon of consumer empowerment in food. The study introduces the vision of (Ben Ayed and El Aoud, 2016) to strengthen the validation of the scale. This scale was identified in the literature review for patients with chronic diseases who are involved in managing their condition with doctors. The study adapts the scale to the context of a consumer who becomes aware of his food choices and seeks to collaborate with brands. This aligns with the research model and is tested to assess its relevance in the Moroccan context.

Economic implication

The findings of this study show that consumer power over food is a growing phenomenon and has significant economic implications. Consumers have increasingly more power when it comes to food. This has led to an increasing demand for organic, local and sustainable food, as well as increased transparency and accountability from food companies. Companies that meet these consumer expectations are seeing increased demand, while those that fail to adapt risk losing market share. To meet this new demand and promote consumer empowerment of their food, food companies can create transparency and improve communication, adapt to new consumer trends, invest in consumer education and encourage consumer participation in product development. Adopting these practices can promote consumers empowerment of their food and lead to better health and greater consumers confidence in the food they buy.

Similarly, the study's findings could have important implications for food companies and policy makers. Companies may need to adapt their marketing strategy to better meet the needs of more informed and demanding consumers. Governments may need to take action to protect consumer rights, for example in food labelling and the regulation of online food advertising. In addition, the findings could encourage innovation in food technology, such as the development of mobile apps that help consumers make informed decisions about their food.

Limits and perspectives research

The random sampling method used in this study may have limitations that undermine its validity and generalisability and lead to biased results. Although the random sampling method may be useful in some studies, it has significant limitations in quantitative studies. Individuals selected solely for convenience may not be truly representative of the population as a whole, as they may have particular characteristics that distinguish them from the rest of the population. The conclusions of a random sample may therefore not be generalisable to the whole population, which reduces the external validity of the results. Therefore, researchers should be aware

of these limitations in future studies and consider some measures to reduce the risk of representativeness: clearly define the target population, use multiple sources to recruit participants (nutrition website, online nutrition discussion forum), collect information on participants' characteristics such as age, gender, education level, socioeconomic status, etc.

This study can also provide other directions for future research in the field of empowerment. The results obtained in this study can be used to explore new research paths on the phenomenon of empowerment using nutritional applications instead of the Internet and web technologies. This could expand the scope of empowerment research and better understand how new technologies can contribute to improving individuals' health and well-being. In summary, it is important to continue exploring new research paths to strengthen individuals' empowerment using new technologies.

References

Adamski M., Truby H.M., Klassen K., Cowan S., Gibson S., 2020. Using the Internet: Nutrition information-seeking behaviours of lay people enrolled in a massive online nutrition course. *Nutrients*, 12(3): 750.

Banti T., Carsin A., Chabrol B., Fabre A., 2016. Diversification alimentaire : L'information disponible sur Internet est-elle en accord avec les recommandations des sociétés savantes ? *Archives de Pédiatrie*, 23(7): 706-713. https://doi.org/10.1016/j.arcped.2016.04.017.

Belharar O., Chakor A., 2022. The impact of Internet technologies on the producer-consumer-eater relationship. *Journal of Social Sciences*, 5(1): 80-87. https://doi.org/10.52326/jss.utm.2022.5(1).10.

Ben Ayed M., El Aoud N., 2016. L'empowerment du consommateur/patient : adaptation et validation d'une échelle de mesure. *Revue Française du Marketing*, 258(4): 7-28.

Cases A.-S., 2017. L'e-santé : L'empowerment du patient connecté. *Journal de gestion et d'economie medicales*, 35(4): 137-158.

Chin W.W., 1998. The partial least squares approach to structural equation modeling. *Modern methods for business research*, 295(2): 295-336.

Cohen J., 1988. *Statistical power analysis for the behavioral sciences*, 2nd ed. Hillsdale, New Jersey: Lawrence Erlbaum Associates Inc.

Croutsche J.-J., 2002. Étude des relations de causalité : Utilisation des modèles d'équations structurelles (approche méthodologique). *La Revue des Sciences de gestion : Direction et Gestion*, 198: 81-97.

Davies A., Elliott R., 2006. The evolution of the empowered consumer. *European Journal of Marketing*, 40(9-10): 1106-1121.

DiFilippo K.N., Huang W.-H., Andrade J.E., Chapman-Novakofski K.M., 2015. The use of mobile apps to improve nutrition outcomes: A systematic literature review. *Journal of telemedicine and telecare*, 21(5): 243-253. https://doi.org/10.1177/1357633X15572203.

Fayn M.-G., des Garets V., Rivière A., 2019. Mieux comprendre l'empowerment du consommateur. *Revue francaise de gestion*, 45(278): 121-145. https://doi.org/10.3166/rfg.2019.00307.

Fernandes T., Remelhe P., 2016. How to engage customers in co-creation: Customers' motivations for collaborative innovation. *Journal of Strategic Marketing*, 24(3-4): 311-326.

Fernandes V., 2012. En quoi l'approche PLS est-elle une méthode a (re)-découvrir pour les chercheurs en management ? *M@n@gement*, 15(1): 102-123. https://doi.org/10.3917/mana.151.0102.

Fornell C., Larcker D.F., 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1): 39-50.

French J.R., Raven B., Cartwright D., 1959. The bases of social power. *Classics of organization theory*, 7: 311-320.

Füller J., Mühlbacher H., Matzler K., Jawecki G., 2009. Consumer empowerment through Internet-based co-creation. *Journal of management information systems*, 26(3): 71-102. https://doi.org/10.2753/MIS0742-1222260303.

Grewal D., Iyer G.R., Krishnan R., Sharma A., 2003. The Internet and the price–value–loyalty chain. *Journal of Business Research*, 56(5): 391-398. https://doi.org/10.1016/S0148-2963(01)00227-2.

Hardey M., 2001. 'E-health': The Internet and the transformation of patients into consumers and producers of health knowledge. *Information, Communication & Society*, 4(3): 388-405.

Harrison T., Waite K., Hunter G.L., 2006. The Internet, information and empowerment. *European Journal of Marketing*, 40(9-10): 972-993.

Hennig-Thurau T., Gwinner K.P., Walsh G., Gremler D.D., 2004. Electronic word-of-mouth via consumer-opinion platforms: What motivates consumers to articulate themselves on the Internet? *Journal*

of Interactive Marketing, 18(1): 38-52. https://doi.org/10.1002/dir.10073.

Hirschman A.O., 1970. *Exit, Voice and Loyalty: Responses to Decline in Firms, Organizations and States*. Cambridge, MA: Harvard University Press.

Kucuk S.U., Krishnamurthy S., 2007. An analysis of consumer power on the Internet. *Technovation*, 27(1-2): 47-56. https://doi.org/10.1016/j.technovation.2006.05.002.

Labrecque L.I., vor dem Esche J., Mathwick C., Novak T.P., Hofacker C.F., 2013. Consumer power: Evolution in the digital age. *Journal of Interactive Marketing*, 27(4): 257-269.

Lacroux A., 2009. *L'analyse des modèles de relations structurelles par la méthode PLS : Une approche émergente dans la recherche quantitative en GRH*. Paper presented at the XXème congrès de l'AGRH, 9-11 September, Toulouse.

Lee S.H., Samdanis M., Gkiousou S., 2014. Hybridizing food cultures in computer-mediated environments: Creativity and improvisation in Greek food blogs. *International Journal of Human-Computer Studies*, 72(2): 224-238. https://doi.org/10.1016/j.ijhcs.2013.08.007.

Lemire M., Sicotte C., Paré G., 2007. *Internet et les possibilités de responsabilisation personnelle en matière de santé*. Cahier de la Chaire de recherche du Canada en TI dans le secteur de la santé, 7.

Levkoe C.Z., Blay-Palmer A., 2018. Food Counts: Food systems report cards, food sovereignty and the politics of indicators. *Canadian Food Studies/ La Revue canadienne des études sur l'alimentation*, 5(3): 49-75. https://doi.org/10.15353/cfs-rcea.v5i3.277.

Li H., Liao F., Qing P., 2022. How consumer expertise influences preference for customized food. *Foods*, 11(16): 2459. https://doi.org/10.3390/foods11162459.

Moati P., 2009. La vente à distance dans la nouvelle révolution commerciale. *Cahiers de recherche du Credoc*, 261: 105-133.

Nam S.-J., 2019. The effects of consumer empowerment on risk perception and satisfaction with food consumption. *International Journal of Consumer Studies*, 43(5): 429-436. https://doi.org/10.1111/ijcs.12521.

Pires G.D., Stanton J., Rita P., 2006. The Internet, consumer empowerment and marketing strategies. *European Journal of Marketing*, 40 (9/10): 936-949. https://doi.org/10.1108/03090560610680943.

Pitt L.F., Berthon P.R., Watson R.T., Zinkhan G.M., 2002. The Internet and the birth of real consumer power. *Business Horizons*, 45(4): 7-14.

Pollard C.M., Pulker C.E., Meng X., Kerr D.A., Scott J.A., 2015. Who uses the Internet as a source of nutrition and dietary information? An Australian population perspective. *Journal of Medical Internet Research*, 17(8): e209. DOI:10.2196/jmir.4548.

Pruche L., 2015. *L'empowerment psychologique du consommateur : Contexte, mécanismes et conséquences*. Marketing PhD Thesis. Université Toulouse 1.

Rappaport J., 1987. Terms of empowerment/exemplars of prevention: Toward a theory for community psychology. *American Journal of Community Psychology*, 15(2): 121-148.

Renault S., 2019. C'est qui le Patron ?! Les enjeux de la mobilisation des consom'acteurs. *Gerer et comprendre. Annales des Mines*, 138: 39-56.

Rezabakhsh B., Bornemann D., Hansen U., Schrader U., 2006. Consumer power: A comparison of the old economy and the Internet economy. *Journal of Consumer Policy*, 29(1): 3-36. https://doi.org/10.1007/s10603-005-3307-7.

Rual C., 2019. *Quels effets d'empowerment et de valorisation de la consommation induits par l'utilisation régulière de dispositif numérique ? : Le cas des objets de quantifield-self et des communautés virtuelles dans la consommation sportive active*. PhD Thesis. École doctorale Sciences économiques et sciences de gestion, Rennes.

Rucker D.D., Galinsky A.D., 2008. Desire to acquire: Powerlessness and compensatory consumption. *Journal of Consumer Research*, 35(2): 257-267. https://doi.org/10.1086/588569.

Sen S., Bhattacharya C.B., 2001. Does doing good always lead to doing better? Consumer reactions to corporate social responsibility. *Journal of Marketing Research*, 38(2): 225-243. https://doi.org/10.1509/jmkr.38.2.225.18838.

Spreitzer G.M., 1995. Psychological empowerment in the workplace: Dimensions, measurement, and validation. *Academy of Management Journal*, 38(5): 1442-1465. https://doi.org/10.5465/256865.

Swasy J.L., 1979. Measuring the bases of social power. In Wilkie W.L. (ed.), *NA - Advances in Consumer Research*, vol. 06. Ann Abor, MI: Association for Consumer Research, pp. 340-346.

Tenenhaus M., Vinzi V.E., Chatelin Y.-M., Lauro C., 2005. PLS path modeling. *Computational statistics & data analysis*, 48(1): 159-205. https://doi.org/10.1016/j.csda.2004.03.005.

Thiétart R.A., 2007. *Méthodes de recherche en management*, 2ème ed. Paris: Dunod.

Wang C.X., Minton E.A., Zhang J., 2020. Sense of power: Policy insights for encouraging con-

sumers' healthy food choice. *Journal of Public Policy & Marketing*, 39(2): 188-204. https://doi.org/10.1177/074391562090.

Wathieu L., Brenner L., Carmon Z., Chattopadhyay A., Wertenbroch K., Drolet A., Gourville J., Muthukrishnan A.V., Novemsky N., Ratner R.K., 2002. Consumer control and empowerment: A primer. *Marketing Letters*, 13(3): 297-305. https://doi.org/10.1023/A:1020311914022.

Wetzels M., Odekerken-Schröder G., Van Oppen C., 2009. Using PLS path modeling for assessing hierarchical construct models: Guidelines and empirical illustration. *MIS Quarterly*, 33(1): 177-195. https://doi.org/10.2307/20650284.

Wright L.T., Newman A., Dennis C., 2006. Enhancing consumer empowerment. *European Journal of Marketing*, 40(9-10): 925-935. https://doi.org/10.1108/03090560610680934.

Zimmerman M.A., 1995. Psychological empowerment: Issues and illustrations. *American Journal of Community Psychology*, 23(5): 581-599. https://doi.org/10.1007/BF02506983.

Annexe 1

Questionnaire

This research work aims to assess the impact of Internet and technology usage on consumer power in the field of food, and therefore on their psychological empowerment
Have you used the Internet to search for information before purchasing a food product that you consume?* ☐ Yes ☐ No
Has the Internet and web technologies, helped you to obtain more information to know whether a product is good for your health?
Thanks to the information provided by the Internet and web technologies
I am better positioned to make a good choice among the available food offers* Not at all agreed 1 2 3 4 5 Totally agree
I have all the information I need to make an informed purchase* Not at all agreed 1 2 3 4 5 Totally agree
I feel capable of choosing my consumption* Not at all agreed 1 2 3 4 5 Totally agree
It has become easy for me to share reviews with consumers* Not at all agreed 1 2 3 4 5 Totally agree
I know that I can raise my voice whether I am satisfied with my consumption or not* Not at all agreed 1 2 3 4 5 Totally agree
The opinion of the consumer has become important for the producer* Not at all agreed 1 2 3 4 5 Totally agree
I can influence consumers through the products I consume* Not at all agreed 1 2 3 4 5 Totally agree

I have the ability to adjust the ingredients of the product if the brand allows it*
Not at all agreed 1 2 3 4 5 Totally agree
How do you rate your level of information for choosing a food product with the boom of nutritional information provided by the Internet?
I think I am the person who knows best about his or her health status and needs*
Not at all agreed 1 2 3 4 5 Totally agree
I am aware of situations and experiences that can have a negative influence on my decisions*
Not at all agreed 1 2 3 4 5 Totally agree
I know where to find information to take care of my consumption*
Not at all agreed 1 2 3 4 5 Totally agree
I know how to take care of my health by being mindful of what I consume*
Not at all agreed 1 2 3 4 5 Totally agree
I am very concerned about my health: (choice of food, products, their composition, etc.)*
Not at all agreed 1 2 3 4 5 Totally agree
I have control over myself and know what is good for my health*
Not at all agreed 1 2 3 4 5 Totally agree
I show independence and responsibility for myself*
Not at all agreed 1 2 3 4 5 Totally agree
I can choose healthy eating goals*
Not at all agreed 1 2 3 4 5 Totally agree
I can choose my consumption according to my nutritional goals*
Not at all agreed 1 2 3 4 5 Totally agree
I am able to understand the difficulties that arise in my consumption decisions
Not at all agreed 1 2 3 4 5 Totally agree
I am able to decide which way is the best for me to reach my nutritional goals
Not at all agreed 1 2 3 4 5 Totally agree
I believe that I can sustain a long-term dietary change*
Not at all agreed 1 2 3 4 5 Totally agree

Profile of respondents

Your gender*	**Your age**	**Your level of education***	**Your professional status***	**Your salary**
Male Female	Less than 25 years old 25-35 years old 46 -55 years old 56-65 years old More than 65 years old	Bachelor's degree 2-year university degree 3 or 4-year university degree 5-year university degree 8-year university degree	Student Employee Civil servant Entrepreneur Self-employed Others	No salary Less than 5000DH 5000-10000 DH 10000-20000 DH 20000-30000 DH More than 30,000 DH