The contribution of cultural variables to predicting intentions to adopt a healthy eating

مساهمة المتغيرات الثقافية في التنبؤ على نيّة الالتزام بتغذية سليمة

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Abstract:

It is commonplace to say that eating behaviors largely depend on the cultural environment. However, most (socio-cognitive) models for predicting healthy eating intention have often given little consideration to the role played by cultural variables in food choices. In this research, we investigate the additional role played by important variables within cultures where the relationship to food is essentially hedonistic in nature. A quantitative survey of 400 Algerian students has shown that the intention to adopt a healthy eating is influenced by commensality, the hedonic dimension (pleasure) in addition to the perception of behavioral control and the subjective norm. We end by underlining the public health implications induced by our results.

Keywords: Healthy eating behavior, cultural variables, behavioral intention, socio-cognitive models.

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JelClassificationCodes: I12 ; M31 ; M48 ; C31.

ملخص:

من الشائع أن نقول انّ السلوكيات الغذائية تعتمد إلى حد كبير على البيئة الثقافية. ومع ذلك، فإن معظم نماذج المعارف الاجتماعية المكتسبة الموضوعة للتنبؤ على نية استهلاك غذائي صحي غالبًا ما تتجاهل الدور الذي يلعبه البعد الثقافي في اختيار الطعام. في هذا البحث، ندرس الدور الإضافي الذي تلعبه المتغيرات المهمة ضمن البيئة الثقافية حيث أنّ العلاقة بالطعام هي أساسًا المتعة في الطبيعة. لقد أظهر مسح كمي لـ 400 طالب جزائري أن نية استهلاك غذائي صحي متأثر بعادة التجمعات حول الغداء والبعد التلذذي (المتعة) بالإضافة

إلى إدراك التحكم السلوكي والبعد الذاتي. لنختم بالإشارة إلى الآثار على الصحية العمومية المستوحاة من نتائج بحثنا.

كلمات مفتاحية: السلوك الغذائي السليم، البعد الثقافي، النية السلوكية، نماذج المعارف الاجتماعية المكتسبة
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1.INTRODUCTION:

This article is a first attempt to introduce cultural variables in socio-cognitive theories usually used in the analysis of healthy eating behaviors. Indeed, the most widely used theories in this perspective have long been cognitive theories (Godin, 2012) to explain whether a behavior will be adopted or not, by referring in particular to fruits and vegetables consumption, which has been presented as an indicator of a healthy eating in several studies (Larson & al, 2008). The dominant theories (The health belief model) (Becker, 1977), the theory of reasoned action and planned behavior (Ajzen, 1991) , social cognitive theory and the theory of interpersonal behaviors (Triandis, 1980) were able to draw up an important list of (cognitive) variables that could explain healthy eating behaviors, without taken into account the cultural specificities of the populations studied. However, it has already been shown that the food perception varies significantly according to food cultures that attribute different functions (Utilitarian / hedonistic) to food (Gomez & Torelli, 2015) which suggests the hypothesis that these differences in perception between cultures can have repercussions on (healthy) eating behaviors.

The theory of planned behavior (TPB) (Ajzen, 1985, pp. 11-39) an extension of *the theory of reasoned action*(Fishbein & Ajzen, 1975) provides, for example, a simple conceptual framework for measuring the relationships between attitudes, the subjective norm, perception of behavioral control, intention and behavior. According to (Guillaumie; Godin & Vezina-IM, 2010) it is the most suitable theoretical approach for predicting intentions and behaviors related to fruits and vegetables consumption.

The theory of interpersonal behavior proposed by (Triandis, 1980), in accordance with *The theory of reasoned action*(Fishbein & Ajzen, 1975), places

importance on controlling the will to explain and predict behavior. However, according to (Triandis, 1977) behavior is not exclusively volitional. Depending on the behaviors borrowed by an individual, some are not under the direct control of the will and may become more or less automated through practice. Thus, behavior is not only the result of behavioral intention (Fishbein & Ajzen, 1975) but also the result of the force of habit in the face of the behavior and the presence of conditions that facilitate or hinder the adoption of it. Thus, if the behavior has been adopted in the past, it will be influenced by "habit" rather than intention, whereas if it has never been adopted, intention will be its only predictor (Godin, 1991).This theory also assumes that the affective component, defined as the emotional response (pleasant or unpleasant, fun or boring, etc.) experienced at the thought of borrowing a given behavior, predicts the intention to adopt it.

Later (Kiviniemi, Voss-Humke & Seifert, 2007) developed " *The Affective Behavioral Associations Model* " to assess the influence of "affective associations" , feelings, emotions and affective states associated with health-related behavior (physical activity) and reveal that " affective associations " significantly predict a given behavior. These associations would also be a mediator of the influence of cognitive variables (constructs of the theory of planned behavior and the health belief model) on the behavior to be adopted. (Kiviniemi & Duangdao, 2009)subsequently affirmed its predictive quality of healthy eating behaviors (consumption of fruits and vegetables).

In *the theory of motivation to protect oneself* (Rogers, 1975) and *the health belief model* (Becker, Maiman, Kirscht, Haefner & Drachman, 1977), the authors have tried to explain the influence of «perceived risk » on healthy eating intention and behaviors, assuming that the consumer must perceive a risk (threat) to their health to adopt a preventive behavior. The literature review confirm that these theories are suitable to explain decision-making regarding preventive actions, they are also useful to identify and clarify the perceptions of the targeted individuals regarding possible risks and the solutions considered (Kloeblen & Batish, 1999) ; they are limited to the evaluation of cognitive influences from the exclusive perspective of health or disease, but the adoption of a healthy eating behavior is not only guided by health reasons but also by other factors (hedonic, cultural…) that must be considered. However, the contribution of these theories in predicting the intention and / or adoption of healthy eating behavior remains minor.

The literature review thus demonstrated the predictive quality of cognitive theories that have developed an exhaustive list of factors explaining healthy eating intentions and behaviors. These theories have explained eating behaviors as being the product of rational decision in relation to the psychological characteristics of people (attitudes, perception of control, perceived risk, etc.) by responding to a certain number of environment influences (subjective norms) and overestimating the weight of the individual dimension of eating behaviors and underestimating the individual linking within different cultures (Murcott, 1995). Indeed, these theoretical models have been mainly tested with populations living in different cultural contexts without taking into account the specificities of each one. The majority of these studies have also been conducted by researchers from countries where diet is more functional and associated with risk factors (anxiety) (Becker, Maiman, Kirscht, Haefner & Drachman, 1977) than pleasure (Kiviniemi & Duangdao, 2009).

These theories support cultural biases that make it difficult to rationally explain healthy eating behaviors in countries where the relationship to food is predominantly hedonistic. In order to overcome (at least in part) its biases, our research is part of a hypothetical-deductive approach mainly based on the hypothesis that cultural differences can (positively) influence behavioral intentions referring to healthy eating.

After selecting a relevant theoretical model in reference to the literature review, we proposed a conceptual model and new hypotheses that we tested empirically using the PLS approach (Partial Least Squares) which allowed us to evaluate the supposed causal relationships between the cognitive predictors of the selected theoretical model (theory of planned behavior) and the proposed additional constructs (cultural variables) . In order to rationally measure the influence of cultural variables on the intentions to adopt a healthy eating, we chose Algeria for its cultural specificities which grant a determining (hedonistic) role to food.

2. A conceptual framework for predicting the intention to adopt a healthy eating:

In the study of healthy eating behaviors, the theory of planned behavior (Ajzen, 1991) has been a dominant theoretical approach for the last three decades, especially among Anglo-Saxon researchers. According to this theory " *when the individual develops a favorable attitude towards a given behavior, perceives that*

the people who matter to him encourage him to adopt this behavior (subjective norm) and feels capable of achieving it (perception of behavioral control), he develops a strong behavioral intention which in turn predicts the corresponding behavior " . As a general predictive theory, it significantly predicts the determinants that independently influence the intention to adopt a healthy eating and its adoption (behavior) (Godin, 2012). It has often been applied to the development of targeted interventions to promote healthy eating (Kothe & al, 2012).

The theory of planned behavior is also established as the most suitable theoretical approach for predicting intentions and behaviors related to fruits and vegetables consumption (Tomasone& al, 2015). The majority of studies have demonstrated the variation in the (healthy) eating behaviors of young people by gender; the sensitivity of girls and boys being influenced by different factors and according to the socio-cultural context of the study. For example, young people living in a conservative cultural environment based on a strong community ties would be more influenced by subjective norms (Americans, Chinese ...) (Chan & al, 2015) than those who living in modern societies (e.g. Danish) (Tomasone & al, 2015), (Blanchard & al, 2009), who would be more sensitive to factors more related to their personality such as the perception of behavioral control or attitude.

In most studies, researchers have attested to the effectiveness of applying the theory of planned behavior to predict intentions and behaviors related to a healthy eating and the consumption of fruits and vegetables among different targets (example) belonging to different cultures. It was also revealed as a better predictor of youth behavior (McEachan, Conner, Taylor & Lawton, 2011).

According to these observations, we have chosen the theory of planned behavior as a theoretical model of our research. We supposed as other researchers: (Chan & al, 2015); (Fila & Smith, 2006); (Gonhoj, Bech-Larsen, Chan & Tsang, 2012), a positive relationship between attitude, subjective norm, perceived behavioral control and student intention to consume at least five fruits and vegetables per day.

In order to measure these supposed relations, we selected our scales based on exhaustive literature review by given priority to those that fit with our research framework, specifically, those applied to the prediction of students' behavior vis-à-vis fruits and vegetables consumption.

To evaluate the relation between students*'* *attitude* and behavioral intention, we referred to the measurement scale proposed by (Steptoe, Perkins-Porras, McKay, Rink, Hilton & Cappuccio;, 2003) who focused on identifying the psychological factors associated with fruits and vegetables consumption (alpha = 0.78), unlike the majority of researchers (Blanchard & al, 2009); (Tomasone & al, 2015), who used the differential semantic scale, which revealed inappropriate for our target during the pre-test of the questionnaire. The students interviewed all presented difficulties in understanding opposite adjectives on a differential semantic scale.

The subjective norm was measured by taking into consideration, the influence of normative beliefs (the opinions of people important to them: family, friends, teachers, etc.) as well as the social influence of impersonal sources (the different media: TV, press, etc.) on their intention to consume at least 5 fruits and vegetables per day, as suggested by (Chan & al, 2015).

Perceived behavioral control was measured by two items corresponding to the extent to which respondents consider that consuming at least 5 fruits and vegetables per day is under their control and the perceived difficulty or ease of consuming at least 5 fruits and vegetables per day in accordance with the definition proposed by (Ajzen, 2002) which allows a common operationalization aiming to measure the perceived difficulty / ease by using the item : " for me performing a behavior X would be very easy / difficult ".

In the theory of planned behavior, *the intention* to adopt a behavior is determined by attitude, the subjective norms and perceived behavioral control. In the study of students' intention to consume fruits and vegetables, the authors use items, which are in our opinion repetitive, justified for the majority of them by empirical aims (outcome processing methods) that require the use of at least three (3) items (e.g.: (Kothe & al, 2012); (Tomasone & al, 2015)). In our research, we chose to measure *the* students' *behavioral intention* with a single item inspired by the study conducted by (Blanchard & al, 2009). Students were asked to indicate their degree of agreement or disagreement with the intention of consuming at least 5 fruits and vegetables per day during the coming month.

Despite its predictive quality, TCP presents conceptual and methodological inadequacies that have been identified by different researchers (e.g.: (Chan & al, 2015)). Indeed, often criticized for its description of exclusively rational reasoning, it neglects other predictors that could significantly affect intentions but also behaviors related to a healthy eating.

Based on the limits of TCP, it seemed essential to propose a conceptual model integrating new variables. In order to do so, we referred to an exhaustive review of the different models of eating behaviors and the different general predictive theories of health-related behavior. In this sense, we proposed to evaluate the relationship between the perceived risks and the students' behavioral intention to consume fruits and vegetables. Barriers and perceived risks were integrated into the theoretical model studied (TCP). Beyond the notion of risk often associated with healthy eating behaviors and in accordance with the objectives of our research, we also introduced cultural variables : the hedonic and cultural dimension signified by a strong attachment to traditions and a high commensality in a Mediterranean food consumption context were then integrated into the TCP, in order to compensate (at least in part) for the lack of consideration, in a unifying model, of factors which can nevertheless be determinants of healthy eating behaviors.

2.1. Risk factors related to nutrition:

As defined by (Ajzen, 1991), risk factors, in the study of a behavior, correspond to a factor that would represent a risk to maintain or increase daily intake according to nutritional recommendations for health and perceived barriers to adopting or maintaining the behavior. Indeed, food consumption has an anxiety-producing aspect based on the "incorporation principle" and the "omnivore paradox", specificities (Giraud, 1995) that have always been linked to the notion of "perceived risk", particularly in marketing (Bauer, 1960).

Many researchers became interested in this factor because its required role to change behaviors, particularly health-related ones, as described by the "motivation to protect oneself model" and the "health belief model" which highlighting the necessity to consider perceived risks when studying healthy eating behaviors among students (e.g.: (Arash, Javad, Shahrbanoo, Fatemeh, Moradi & Sepahi, 2016); (Morrow, Lunbrook, Macdiarmid & Olajide, 2016)).

In the context of our research, it seemed essential to focus on the physical risk that prevails in the food risk (Aurier & Sirieix, 2009). As described by (Laporte, Michel & Rieunier, 2015), food risk includes two dimensions: health risk and nutritional risk. Since, health risk is taken into consideration by communities and nutritional risk relates to the individual's appreciation considered responsible for his nutritional choices, we will only use " nutritional perceived risk " for this research, which expresses *" an uncertainty related to*

negative consequences of a long-term food choice on physical, mental and social health " (Aurier & Sirieix, 2009), which is in line with the two dimensions of" perceived risk "proposed in the two models described above (perceived severity and vulnerability).

The lack of research interest in perceived nutritional risk assessment motivated our desire to include it into an expanded version of (TPB), supposing a negative relationship between these risks and student behavioral intention, which we chose to measure by using the "perceived risk" dimension from the health belief model (Becker, 1977), which suggests that perceived risk is measured in terms of vulnerability (if the person considers himself susceptible to contracting a disease) and perceived severity (if the person perceives the onset of the disease as dangerous and likely to have severe consequences on some aspects of his life). In this sense, we have adapted the scale proposed by (Deshpande, Basil & Debra, 2009).

As part of understanding the determinants of healthy food consumption, (Fila & Smith, 2006) have integrated perceived barriers as additional constructs into the theory of planned behavior (TPB). Results presented it as the most important determinant of healthy consumption (correlation of 0.46), the most predictive barriers being product availability and taste. In their literature review, (Gurviez & Sirieix, 2010, pp. 136-137) identified various barriers that can negatively influence fruit and vegetable consumption. The purchase price considered too high, convenience, time including personal investment and the perishability of products, and accessibility were considered the most frequently cited barriers by students. (Shepherd, Harden, Reesm Brunton, Garcia, Oliver & Oakley, 2006)found that young adults' preference for outside food taste (fast food, etc.) also represents a major difficulty to their regular consumption of fruits and vegetables. According to (Soliah, Walter & Antosh, 2006), students also suffer from a lack of knowledge, interest and cooking skills, which would represent a barrier on fruits and vegetables consumption whose preparation requires a certain know-how.

The review of the literature nonetheless revealed that few researchers have tried to integrate the variable "perceived barriers" into the theory of planned behavior in the study of the behavioral intention of students to consume fruits and vegetables or even to adopt a healthy eating. It therefore seemed important to us to integrate this variable into the theory of planned behavior as suggested by

(Chan & al, 2015)by assuming a negative link between perceived barriers and the behavioral intention of students. The most significant barriers for students have been grouped in various studies (Gurviez & Sirieix, 2010) to measure the construct “perceived barriers”.

However, the literature review revealed that few researchers have attempted to include the "perceived barriers" into the (TPB) to study students' behavioral intention to eat fruits and vegetables or to adopt a healthy eating. We consequently seemed important to integrate this variable into the (TPB) as suggested by (Chan & al, 2015)by assuming a negative relation between perceived barriers and students' behavioral intention. The most significant barriers for students were collected from different studies (Gurviez & Sirieix, 2010) in order to measure the "perceived barriers" construct.

2.2. The cultural aspect of food:

Motivated by a better understanding of student’s healthy eating behaviors with serious considerations of Algerian cultural specificities which dictated by a strong emotional relation (hedonic dimension) with food, we think it’s appropriate, at first, to establish this link between culture variables and students’ intentions to consume at least five fruits and vegetables per day.

The evaluation of this affective relationship essentially caused by senses stimulation (Aurier & Sirieix, 2016) and health-related behaviors has mainly applicate in the literature via predictive (cognitive) theories, such as (Triandis, 1980)’s theory of interpersonal behavior, which suppose that the affective dimension, defined as the emotional response (pleasant or unpleasant, amusing or boring, etc.) related to a given behavior, predicts the intention to adopt it. Later, (Kiviniemi & Duangdao, 2009) verified its predictive quality by evaluating the influence of "affective associations", feelings, emotions and emotional situations on healthy eating behaviors (fruit and vegetable consumption).

The literature has also revealed the necessity to integrate the hedonic dimension in the predictors of healthy eating behaviors studies, because when this dimension is not attributed to fruits and vegetables consumption, it can limit their consumption (Treiman, Freimuth, Damron, Lasswell, Anliker, Havas, Langenberg & Feldman, 1996). However, very limited researches were interested to this topic. In this sense, we supposed a positive relationship between the hedonic dimension and students' behavioral intention, which we measured by adapting a scale developed and tested by (Audebert, Deiss & Rousse, 2006) who defined this

dimension as the affective/emotional reactions (taste, pleasure, etc.) caused by the sensory characteristics (perfume, color, shape, etc.) of a food.

Beyond its hedonic function, cultural variables can have additional aspects (Aurier & Sirieix, 2016). An exhaustive review of the literature by (Stein, 2012) has revealed that different disciplines have been interested in defining the concept of culture and its influence on purchasing and consumption behaviors. In *anthropology*, the *particularistic* tradition affirms the necessity to maintain distinctions between cultures (Boas, 1930). The *sociological* trend, in opposition to the anthropological trend, postulates culture as a process of learning a common values and beliefs of the group (e.g. (Hofstede, 2001)). The *cultural* consumption approach emphasizes the importance of the consumer's culture, which is all the symbols present in consumer's environment integrates to build his identity (Arnould & Thompson, 2005). In view of a fluent literature, we choose to use the definition proposed by (Khaled, Fischer & Biddle, 2008), which indicates that "*culture informs us about the behaviors, values, norms and practices of a group and provides the rules that govern how we behave*"; it is therefore the product of behavior and not innate, it is learned and derives from the individual's social environment (Stein, 2012).

Other numerous models show the progressive evolution of food consumption research (e.g. (Sijtsema, Linnenmann, Van Gaasbeek, Dagevos & Jongen, 2002)). The models developed by nutrition science have firstly focused on environmental and situational factors (Pilgrim's food acceptance model (Pilgrim, 1957) and Tolksdorf's meal model (Tolksdorf, 1975), then on individual factors, taking less into consideration the physicochemical properties of foods and more their subjective perception from which their preferences are derived (e.g. (Kahn, 1981); (Merdji, Mathieu & Lambert, 1999); (Sirieix, 1999); (Padilla, Bricas, Khaldi & Haddad, 2002)).

(Merdji, Mathieu & Lambert, 1999)have, for example, focused their interest on the role of social representations in the formation of attitudes, based on an original modeling of the determinants of food preferences that considers certain environmental factors as determining food availability. Based on anthropology and cognitive psychology, this model proposes an enrichment of the concept of attitude.

Models developed by authors from the nutrition science discipline (Kahn, 1981)present homogeneous approaches that provide an important but non-

exhaustive list of variables that intervene or are likely to intervene in the food choice process. In these models, food consumption is the result of interactions between different variables, including culture, usually seen as the most general dimension of the environment, is explicitly presented as an individual variable. Cultural origins, religion, beliefs and traditions, culture, race, geographic region (Kahn, 1981) and consumption context are considered as variables to assess the influence of this dimension on food preferences.

In economics, (Padilla, Bricas, Khaldi & Haddad, 2002) proposed a model of the propensity to consume determined by preferences and access capacities (socioeconomic factors) to food. In their model, social factors (family, culture, groups) and individual factors (genetics, learning) are determining factors of preferences development, prior to food choice and consumption.

In (Sirieix, 1999)'s model, social and cultural factors are better considered because they operate at two distinct levels. First, they contribute jointly with individual factors to the formation of food preferences that will partly define consumption choices. Secondly, they contribute jointly to personal factors and the consumption context, to the development of food practices which in turn create consumption experiences. These experiences combined with the consumer's confidence in indicators (price, appearance, etc.) and characteristics (taste, freshness, health, etc.) of quality (perceived quality) will then define his food choices.

What is surprising is the lack interest of researchers about influence of the cultural variables on eating behaviors from a marketing perspective. The majority of empirical research including the cultural variables were comparative studies designed to explain the differences between two (or more) cultures by using Hofstede's "Five Cultural Dimensions" (Hofstede, 2001), with the individualism or collectivism dimension as the most studied ones (Orji & Mandryk, 2014). *Consumer Culture Theory*(Arnould & Thompson, 2005) refers to how consumers, in a kind of social arrangement, exploit the symbolic implications (of images, texts and produced objects) encoded in advertisements, brands, shelves/showcases and other goods to express their personality, social allegiance, identity and lifestyle ((Kamdem), 2012). It permits to establish a "general" theoretical framework for establishing a confident link between different aspects of culture and consumer behavior without taking into account the cultural variable.

The majority of research conducted in the healthy eating behaviors context highlighted using a multidisciplinary approach, the determinism of individual and

environmental factors mainly via cognitive models developed with populations living in different cultural contexts without taking into account the specificities of each one. However, the definition of a meal, the plates, the form of the eating day (number of meals, schedule, etc.), the methods (place, context of food intake, etc.), and also the ways of eating vary significantly from one culture to another and between social groups within the same culture ((Fischler, 1990); (Poulain, 2002)). The eating follows protocols imposed by society.

In the Mediterranean, where the relationship with food is essential, the meal plays an essential social role. The communities living around the Mediterranean basin (Algeria...) share a strong attachment to traditions and rituals. The food, the specific methods of preparation and the way it is consumed during the three daily meals obey, in this sense, certain rituals and remain markers of status that are part of the identity of even the most modest individuals in certain circumstances (weddings, religious festivals ...). The sharing of a meal then takes place in a certain cohesion and conviviality where the family plays a particular role in the acquisition and application of food practices (Pearson, Biddle & Gorely, 2009). This notion of sharing, transmission and conviviality also refers to a high value of commensality in the Mediterranean. In contrast, modern Western cultures, where the individualization and medicalization of food define eating behaviors, underestimate the determinism of the social and cultural environment in the adoption and maintenance of healthy eating.

Indeed, the literature review has revealed that in the particular case of “eating behavior”, the cultural dimension is a determining factor as demonstrates by numerous studies who highlighted the importance of these determinants in tastes and food preferences establishment and of the categorization of products and their functions orientation (Nicolas, 1999, pp. 102-103). In addition to individual psychological variables (attitudes, perception of behavioral control) and environment influence (subjective norms), the cultural factor must be taken into consideration in eating behaviors study (Delomier, Frohlich & Potvin, 2009). In this sense, we supposed a positive link between the cultural dimension and students' intention to consume (at least) five portions of fruits and vegetables, per day.

Inspired by the various research results, we measured our "cultural dimension" construct by formulating items that express the general link between the fruit and vegetables consumption and Algerian eating habits, which are part of a cultural identity expression marked by a strong attachment to the traditions that

notably dictate the meals composition and how they are prepared (conviviality, family cohesion) (Lejeune, Aikaterinin Livydikou & Terekhina, 2009, p. 9) in an context strongly impacted by parents' food choices (Gurviez & Sirieix, 2010).

3. Methodological frame:

A quantitative survey using a self-administered questionnaire was conducted with a sample exclusively composed of students. As the questionnaire was relatively time-consuming, it was only delivered to volunteered students, outside of class hours in order to avoid non-response bias.

The questionnaire was divided in three parts: The first one aims to identify the students' eating behaviors by measuring their daily fruits and vegetables consumption and their nutritional knowledge. In the second part, the relationships between the constructs of the proposed conceptual model and the students' behavioral intention were measured. The last part was established in order to establish our sample profile, according to socio-demographic characteristics.

3.1. Specificities of the population and research context:

The choice to interview students exclusively is justified by various findings. From a theoretical point of view, the majority of research on (healthy) eating behaviors emphasizes the necessity to study students' eating behaviors independently of those of adults, children, adolescents or other specific targets suffering for example from a pathology (obesity, diabetes...) (Deshpande, Basil & Debra, 2009). (Chan & Tsang, 2011)also highlighted the vulnerability of students, who face a certain autonomy in their food choices during their transition to university. They are in fact strongly influenced by daily exposure to food industry products or fast food, to the detriment of the Algerian traditional food that relegated to festive occasions (Chikhi & Padilla, 2014). This transition to adulthood can before lead, in some cases, to a deterioration of the nutritional status of the students and become an opportunity to adopt bad eating habits which can be maintained until adulthood (Racette & al, 2008).

The survey was conducted in Algeria where the proportion of the young population stays dominant with 45% of the total population under 25 years of age, with ONS projections predicting growth of 4.4% by 2040 (La-population-algerienne-a-42-2-millions-d'habitants au 1er janvier 2018. , 2018) This specific population also represents an important target for public health actors, who can

knowingly, anticipate and react in order to reduce the prevalence of certain chronic diseases[1] (obesity, cancer, cardiovascular disease, diabetes, etc.) linked to unhealthy eating in the adult population.

It is also important that this research was conducted in Algeria, as this southern Mediterranean country offers an ideal cultural context for understanding the healthy eating behaviors of young adults who evolve in an environment where the relationship with food is mostly linked to the pleasure of eating traditional food with their family. This allowed us to evaluate the variation in students' intentions to consume (at least) five fruits and vegetables per day according to cultural variables signified by a strong attachment to traditions and eating habits.

3.2. Respondents profile:

A convenience sample of 400 students was selected based on a homogeneous distribution of students interviewed. The students are aged between (18-22 years) and have (78.3%) a normal build (BMI[2] 18-25). They mainly live outside the parental home, most of them living in university campuses (71%), and they were confronted with the obligation to make independent food choices. However, their eating habits stay strongly influenced by the family environment.

In this sense, the majority reported that their fruits and vegetables consumption was mostly done at home (90%) during daily meals with family members (90%). The students also seem to be well informed about the WHO (World Health Organization) recommendations regarding the quantities of fruits and vegetables to be consumed daily (41% at least 5 servings per day). However, they reported consuming between three and four servings (50%) on a standard day.

4. Predictors of students' intention to adopt a healthy eating in a hedonistic cultural context

The collected data were analyzed by Partial least Squares path modeling (PLS) which is done by evaluating the measurement model which, once validated, allows the evaluation of structural relationships on the basis of refined scales (references).

[1] Diseases that occupy the first place of death causes in Algeria with a rate of 58.6%.

[2] Body Mass Index.(BMI)

4.1. Evaluation of the measurement model:

The evaluation of the measurement model revealed that the majority of the proposed scales have a good internal reliability and good convergent (Average Variance Extracted (AVE)) and discriminant (HTMT criterion) validity. The principal component analysis (PCA) with Varimax rotation however allowed us to purify the scales which presented a poor reliability and/or validity while respecting the theoretical validity of the contents (Table 1).

The attitude, the perception of behavioral control, and the perceived nutritional risk, have been shown to be reliable and valid. The measures of the subjective norm were split into two dimensions: influence of relatives (NS1-NS4) and influence of the media (NS5-NS8). The PCA revealed three distinct dimensions in the case of "perceived barriers": Difficult access (brake2-brake6), preparation difficulties (barrier4-barrier5) and unavailability outside the home (barrier8-barrier9).

Items measured ant the "hedonic dimension" were withdrawn, only four items were retained (emotion1-2-4-5). The construct "Cultural dimension" was split into two dimensions: eating habits (Culture1-Culture4) and commensality (Culture5-Culture8).

The evaluation of discriminant validity presents values all less than (0.85), which indicates good discriminant validity (Voorhess, Brady, Calantone & Ramirez, 2016). This indicates that each construct is distinguished from the other constructs and that its contribution is therefore unique (Malhotra, Decaudin & Bouguerra, 2007). Therefore we can attest that all the constructs of the extended model do measure different concepts.

Subsequently, the structural model was evaluated on the basis of the measurement model with clean scales. The positive and negative links assumed in the proposed conceptual model were then verified.

Table 1.Results of the evaluation of the measurement model

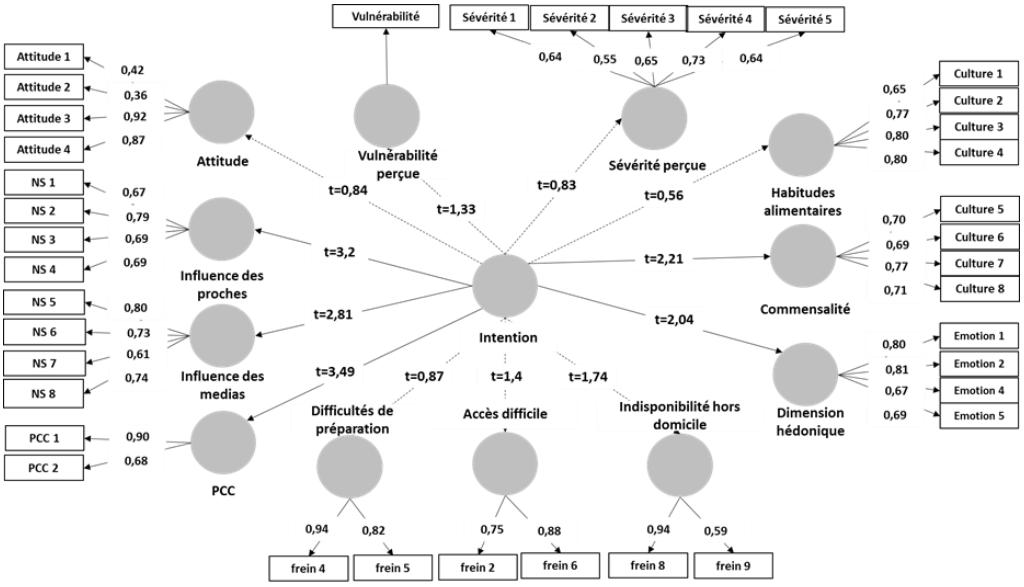
Constructs	Measures	Composite reliability (≥0.7)	Shared mean variance (≥0.5)
Attitude	Attitude1-Attitude4	0.76	0.48
Subjective norms	NS1-NS8	0.79	0.33
Perceived control	PCC1-PCC2	0.78	0.64
Perceived barriers	Barrier1-Barrier9	0.01	0.12
Perceived nutritional risk	Severity1- Severity5	0.78	0.42
Hedonic dimension	Emotion1-Emotion8	0.81	0.38
Cultural dimension	Culture1-Culture8	0.79	0.33

Source: Developed by us

4.2. Evaluation of the structural model:

The assumed structural relationships (hypotheses) were tested by examining the significance of the "structural coefficient". The significance of the coefficients was evaluated by a bootstraping procedure (500 samples) (Efron & Tibshirani, 1993). Thus, if the (Student's $t > 1.96$) or if the value ($p < 0.05$) on all the samples, this is an indicator of the significance of the results (Figure.1).

Fig.1.Results of the evaluation of the structural model



Source: Smart PLS-3rd version

4.2.1. Individual determinants:

Students intending to consume (at least) five fruits and vegetables per day should feel "capable" of adopting this behavior without having to face any particular difficulties. In this sense, the perception of behavioral control (t=3.49) is a significant predictor of their intention to adopt a healthy eating, as previous research findings identified in the literature which identified it as the most significant predictor ((Chan & al, 2015), (Blanchard & al, 2009), (Lien , Lyte & Komro, 2002).

Attitude, perceived barriers and perceived nutritional risk appeared as weak predictors of students' intention to consume (at least) five fruits and vegetables per day. However, these results can be explained by the youthful of respondents and their relationship to health. In fact, young people usually do not attach importance to their health and do not necessarily perceive the benefits (attitude) that a healthy eating can have on their current or future health status.

In the same perspective, perceived barriers and perceived nutritional risk don’t influence students' behavioral intentions. Like students from other cultures, they are part of a "positive" approach and don’t necessarily perceive the short or long term nutritional risks incurred, which can nevertheless lead to the emergence of highly handicapping diseases such as diabetes, cardiovascular disease or

obesity. A cultural bias induced by the relationship to alimentation in countries where other research has been conducted (Japanese, American) can also justify these contradictory results with the literature review. Indeed, for Algerian students who evolve in a food culture where traditional meals are composed in part of fruits and vegetables and mostly taken with family member; the barriers usually perceived (difficult access, cooking difficulties, and unavailability in fast food and school restaurants) don't represent an obstacle to their intention to consume it.

4.2.2. Social determinants:

The social influence of students would be attributed to personal sources (t=3.2) followed by impersonal sources (the media) (t=2.81). Students would give more importance to the opinion of people in their immediate environment (parents, friends, etc.) and would be inclined to follow their recommendations regarding fruit and vegetable consumption, than to media as behavioral norm of perception of social pressure, as revealed by (Chan & al, 2015) and (Gonhoj, Bech-Larsen, Chan & Tsang, 2012).

In their application of TPB, (Lien , Lyte & Komro, 2002) and (Kothe & al, 2012) also confirmed the positive influence of the subjective norm on young adolescents' intention to consume fruits and vegetables. However, in both cases, the authors only measured the influence of interpersonal norms omitting the influence of the media.

4.2.3.Cultural determinants:

The results obtained (t=2.04) revealed that the emotional component (pleasure) resulting from the sensory characteristics of fruits and vegetables (smell, appearance) represent a significant predictor of students' intention to consume (at least) five fruits and vegetables per day, establishing a proven (positive) link between the hedonic dimension and students' behavioral intention. In this way, students who develop positive affective reactions related to the sensory characteristics of fruits and vegetables are more likely to consume it.

The influence of the cultural dimension was tested via two distinct constructs: "Eating habits" ($t=0.56 < 1.96$) and "Commensality" ($t=2.21 > 1.96$).

Although Algerian students evolve in a Mediterranean context where attachment to habits and rituals is very important, our students, like young people from different cultures, go through a phase of intergenerational rupture, they are more sensitive to media and fashion effects, and cultivate a certain ambiguity between modern food that reflecting their identity and traditional food (Chikhi &

Padilla, 2014). Residing in the "university-campus" during the academic year (71%), they are more exposed in their daily lives to "modern" products than to traditional products which are increasingly reserved exclusively for family meals (90%). Thus the collective environment (fast food, school canteens...) replaces the family group in the daily life of students; their "tastes" became essentially formed outside the household, where food is simplified, industrialized and rarely reflects Algerian traditions. The idea of integrating fruits and vegetables into their eating habits simply because they are associated with Algerian culinary traditions and rituals would escape the attention of students who don't consider traditional food as a factor that can influence their intention to consume (at least) five fruits and vegetables per day.

Commensality" would positively influence students' intention to eat (at least) five fruits and vegetables per day ($t=2.21 > 1.96$). Indeed, as established by the literature review, food plays a primordial social role, especially in a Mediterranean context, where meals take place in a certain cohesion and conviviality within the family (reference). Thus, the representation of "eating together" in a Mediterranean context expresses a high degree of commensality even among Algerian students who favor traditional meals based on fruit and vegetables, with family members, in a convivial setting (90%).

5. Discussion:

The major contribution of our research resides in the proposal of an integrative conceptual framework to study determinants of students' behavioral intention towards healthy eating with considering the food cultural specificities in a country where alimentation is closely linked to the "pleasure of eating together". The second important result of our study is that TPB as a theoretical model is moderately ($R^2=0.16>0.13$) adapted to the identification of determinants of students' behavioral intention regarding to fruit and vegetable consumption. The proposed extended model also has moderate predictive power ($R^2=0.18>0.13$). However, the proposed additional constructs improve the predictive power of TPB by 2%.

In accordance with our research results, the literature review revealed that healthy eating behaviors (e.g. (Chan & Tsang, 2011)), especially those related to fruit and vegetable consumption (e.g. (Pearson, Biddle & Gorely, 2009)) were strongly determined by parents' eating practices. Teachers would also represent a reliable source of information for students. They can consequently play an

educational role by providing relevant information on nutrition and health (Lee &Nieman, 2012). The media, especially the new ones (internet) can also encourage students to consume (at least) five fruits and vegetables per day, with TV and the internet as the most appreciated by young people (Gonhoj, Bech-Larsen, Chan & Tsang, 2012).

There is also a positive relationship between the hedonic dimension and the students' intention to consume (at least) five fruits and vegetables per day. This result is important because it provides a modest theoretical contribution to understanding students' behavioral intention, by demonstrating that in addition to the "cognitive" factors usually evaluated by the "theory of planned behavior", the hedonic aspect has a significant predictive power to explain fruit and vegetables consumption in the Mediterranean area, also amongst young people. From a methodological point of view, the evaluation of the "hedonic dimension" as proposed in our research reveals the value to consider simultaneously affective associations (Kiviniemi, Voss-Humke & Seifert, 2007) and the sensory characteristics of foods (Audebert, Deiss & Rousse, 2006).

The cultural dimension revealed as an insignificant predictor of students' behavioral intention in the context of healthy eating consumption. For students, youth in transition to adulthood, having to assume new financial and organizational responsibilities concerning their own food choices (Ruud et al, 2005) there is no significant link between "eating habits" measured by students' attachment to Algerian food habits, traditions and practices and their intention to consume fruit and vegetables. These results are important because they confirm the evolution of the Algerian food consumption model, especially for students, who are daily exposed to "unhealthy" industrialized foods which are certainly more adapted to their university lifestyle but contribute to the deterioration of their nutritional situation.

However, the "commensality" defined as the representation of "eating together" does positively influence students' intention to consume (at least) five fruits and vegetables per day. These results are not surprising, if we consider that the majority of students interviewed in our research linked fruit and vegetable consumption to a family and conviviality; with home as the main place for commensality.

Perceived nutritional risk and perceived barriers emerged as non-significant predictors of students' behavioral intention. This finding contributes, at the theoretical and methodological level, to the relevance of taking into consideration the age of respondents and the cultural context when studying healthy eating behaviors.

The students' intention to consume fruits and vegetables would be determined by the characteristics of ingested foods, the sensory perceptions (hedonic dimension) already identified as determinant variables by the food and nutritional sciences (references). It would also be influenced by individual variables (perception of behavioral control) and environmental variables signified by the social pressures (interpersonal and impersonal) perceived by the students (subjective norm) and by the cultural dimension described by a high commensality in a context of South Mediterranean food consumption.

The results obtained, push to consider more broadly the links (hypotheses) supposed in our research context. They encourage in particular, to a better reflection on the measurement scales used, especially for additional constructs proposed and to consider introducing other variables that explain eating behaviors in order to potentially improve the predictive quality of the proposed model.

6. Conclusion:

Historically, healthy eating has frequently been associated with a restrictive approach to healthy/unhealthy foods. In this sense; it was mainly attributed to psychological factors, such as attitude or the perception of behavioral control, with a certain influence of (subjective) social norms, in particular the influence of parents, teachers, friends, etc., with a predominance of the "risk factor" in the determination of healthy food choices.

This research has revealed that in a cultural context where food consumption is hedonic in nature, it is difficult to predict the intention of students to adopt a healthy eating by only considering the determinants historically formalized by cognitive theoretical models which do not necessarily include cultural variables such as the hedonic dimension related to food, the attachment to traditions or commensality as independent variables, by confronting them in one and the same model. The identification of the determinants of the students' intention to adopt a healthy eating in Algeria, brings a new reflection that could be beneficial to public health policy, health educators as well as companies.

Encouraging fruit and vegetables consumption that represent the basic group of foods for healthy eating adoption, should be a priority for public health policy. In fact, awareness of the importance of improving healthy eating behaviors amongst a specific and vulnerable population (students) by anticipate their adult behaviors, will permit to contain (at least in part) the proliferation of non-communicable diseases linked to unhealthy eating which are responsible for a serious public health problem in the world.

In response to major public health problems, the public health actors need to reconsider their communication strategy ensuring that the message is culturally adapted to the target audience. For example, when addressing young people who live in a hedonistic context of food consumption, we should promote the pleasure of eating together, in a family and convivial environment which appear more important than the fears associated with the physical risks involved on short or long terms. In fact, the public health policies, particularly in Europe, have mainly focused on the medicalization and individualization of food (Fishler, 2011) through negative messages based on fears have to be banished. Promoting healthy eating should be done by re-inscribing (healthy) food in a social and cultural context. The notions of "sharing" and "conviviality" have to contribute to promote the "well-being" and not only considered as a way to maintain a good health.

Farmers as well as agri-food companies (especially fruit and vegetable products) should also capitalize on current consumer demand for healthy eating and integrate it into their strategic business plans. This study could help these companies, as well as public authorities, to develop communication strategies adapted to young consumers (messages and media used). By recognizing their social responsibility, in collaboration with public authorities, they could also design educative programs to provide parents and teachers (subjective norm) the tools to take a responsible and active part in communicating healthy eating to students.

The majority of students from different cultures are exposed to "generalist" advertisements designed according to predictors of healthy eating behaviors identified among an adult target audience, without considering the specific characteristics of the targeted population or the cultural determinants of the society where they live. However, the students' age is a determining factor of their behavioral intention to adopt healthy eating. In this sense, their youth explains that they are still influenced by personal and impersonal norms (subjective norms) which are amplified by their affiliation to the Algerian culture

that privileges high food pleasure and commensality. They are therefore part of a positive and optimistic approach that is far from the health repercussions attributed to the risks incurred.

Health educators, designers of public health campaigns and food companies should develop targeted campaigns with a positive message that promotes the hedonic dimension and the benefits of eating together, with family members, in a convivial environment.

7. Bibliographic References:

1. Books

(Ajzen. (1985). *From intentions to actions: A Theory of Planned Behavior*. Springer, Berlin, Heidelberg .

Ajzen. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 179-211.

Aurier & Sirieix. (2009). *Marketing des produits agroalimentaires.* Paris: Dunod.

Aurier & Sirieix. (2016). *Marketing de l'agroalimentaire : Environnement, strategies et plans d'action.*Paris: Dunod.

Boas. (1930). Antropology. *Encyclopedia of the social sciences*, 73-110.

Efron & Tibshirani. (1993). *Introduction to the Bootstrap.* United state of America: CHAPMAN & HALL/CRC.

Fischler. (1990). *L'homnivore.* Paris: Odile Jacob.

Fishbein & Ajzen. (1975). *Attitude, Intention and Behavior: An Introduction to Theory and Research.* Addison-Wesley.

Hofstede. (2001). *Culture's consequences , comparing values, behaviors, institutions and organizations across nations.* California: Sage Publications Inc.

Lee & Nieman. (2012). *Nutritional assesment* . New York: The MacGrow Hill compagnies.

Malhotra, Decaudin & Bouguerra. (2007). *Etudes marketing avec SPSS.*Paris: Pearson Edition.

2. Theses

Stein. (2012). *L'impact de la culture sur le comportement de consommation : modélisation d'un comportement de consommation éthique ethnique.* Artoise: Ecole doctorale sciences economiques, sociales de l'amenagement et du management.

3. Journal article

Ajzen. (2002). Perceived behavioral control, self-efficacy, locus of control and the theory of planned behavior . *Journal of Apllied Social Psychology*, 1-20.

Arash, Javad, Shahrbanoo, Fatemeh, Moradi & Sepahi. (2016). Applying the health belief model constructs to determine predictors of dietary behavior among high-school students. *British Journal of Medicine & Medical Research*, 1-7.

Arnould & Thompson. (2005). Consumer culture theory CCT twenty years of research . *Journal of Consumer Research*, 868-882.

Audebert, Deiss & Rousse. (2006). Hedonism as a predictor of attitudes of young french women towrds meat. *Appetite*, 239-247.

Becker. (1977). The Health Belief Model and Prediction of Dietary Compliance: A Field Experiment. *Journal of Health and Social Behavior*.

Becker, Maiman, Kirscht, Haefner & Drachman. (1977). The Health Belief Model and Prediction of Dietary Compliance: A Field Experiment. *Journal of Health and Social Behavior*, 348-366.

Blanchard & al. (2009). Understanding adherence to 5 survings of fruit and vegetable per day: A theory of planned Behavior perspective. *Journal of Nutrition Education and Behavior*, 3-10.

Chan & al. (2015). Using an expended Theory of Planned Behavior to predict adolescents' intention to engage in healthy eating. *International Journal of Consumer Marketing*, 1-34.

Chan & Tsang. (2011). Promoting health eating among adolescents : Ahong Kong study. *Journal of consumer marketing* , 354-362.

Chikhi & Padilla. (2014). Alimentation en Algerie : Quelles formes de modernite? *New Medit*, 50-58.

Delomier, Frohlich & Potvin. (2009). Food and eating as social practice : Understanding eating patterns as social phenomena and implications for public health. *Sociology of health and Illness*, 215-228.

Deshpande, Basil & Debra. (2009). Factors influencing healthy eating habits among college students : An application of the Health Belief Model. *Health Marketing Quarterly*, 145-164.

Fila & Smith. (2006). Applying the theory of planned behavior to healthy eating behaviors in urban Native American Youth. *International Journal of Behavioral Nutrition and Physical Activity*, 11-20.

Godin. (1991). L'education pour la sante : les fondements psycho-sociaux de la definition des messages educatifs . *Sciences Sociales et Sante* , 67-94.

Godin. (2012). *Les comportements dans le domaine de la sante : comprendre pour mieux intervenir.* Montreal: Presses de l'universite de Montreal.

Gomez & Torelli. (2015). It's not just numbers: Cultural identities influence how nutrition information. *Journal of Consumer Psychology*, 404-415.

Gonhoj, Bech-Larsen, Chan & Tsang. (2012). Using theory of planned behavior to predict healthy eating among Danish adolescents. *Health Education* , 4-17.

Guillaumie; Godin & Vezina-IM. (2010). Psychosocial determinants of fruit and vegetable intake in adult population : A systematic review. *International Journal of behavioral nutrition and physical activity*, 1-12.

Gurviez & Sirieix. (2010). La consommation des fruits et legumes : de l'etude des determinants de la consommation a celle de la valeur de consommation. *Innovations Agronomiques*, 127-140.

Kahn. (1981). Evaluation of food selection patterns and preferences . *Critical review of food sciences and nutrition* , 129-153.

Khaled, Fischer & Biddle. (2008). A Qualitative Study of Culture and Persuasion in a Smoking Cessation Game. *Persuasive*, 1-12.

Kiviniemi & Duangdao. (2009). Affective associations mediate the influence of cost-benefit beliefs on fruit and vegetable consumption . *Appetite*, 771-775.

Kiviniemi, Voss-Humke & Seifert. (2007). How do i feel about the behavior? The interplay of affective associations with behaviors and cognitive beliefs as influences on physical activity behavior. *Health Psychology* , 152-158.

Kloeblen & Batish. (1999). Understanding the intention to permanently follow a high folate diet amomg a simple of low income pregnant women according to the Health Belief Model. *Health Education Research*, 327-338.

Kothe & al. (2012). Promoting fruit and vegetable consumption: Testing an intervention based on the Theory of Planned Behavior. *Appetite*, 997-1004.

Laporte, Michel & Rieunier. (2015). Mieux comprendre les comportements alimentaires grace au concept de perception du risque nutritionnel. *Recherche et Applications en marketing*, 81-117.

Larson & al. (2008). Fruit and vegetable intake correlates during the transition to young adulthood. 33-37.

Lien , Lyte & Komro. (2002). Applying theory of planned behavior to fruit and vegetable consumption of young adolescents. *American journal of health promotion* , 189-197.

McEachan, Conner, Taylor & Lawton. (2011). Prospective prediction of health-related behaviors with the theory of planned behavior: a meta-analysis. *Health Psychology Review*, 97-144.

Merdji, Mathieu & Lambert. (1999). RepResentations et determinants des gouts : vers un enrichissement du concept d'attitude en marketing. *Economie et marketing alimentaire* , 101-116.

Morrow, Lunbrook, Macdiarmid & Olajide. (2016). Perceived barriers towrds healthy eating and their association with fruit and vegetable consumption. *Journal of Public Health*, 330-338.

Murcott. (1995). Social influences on food choice and dietary chage: A sociological attitude . *Poceedings of the Nutrition Society*, 729-735.

Nicolas, A. &. (1999). *Economie et marketing alimentaires* .Paris: Tec & Doc.

Orji & Mandryk. (2014). Developing culturally relevent design guiedlines for encouraging healthy eating behavior . *International journal human-computer studies*, 207-223.

Padilla, Bricas, Khaldi & Haddad. (2002). L'approche causale appliquee a la surveillance alimentaire et nutritionnelle en Tunisie . *Options Mediterraneennes*, 119-134.

Pearson, Biddle & Gorely. (2009). Family correlates of fruit and vegetable consumption in children and adolescents : a systematic review. *Public health and nutrition* , 267-282.

Pilgrim. (1957). The components of food acceptance and their measurment. *American Journal of Clinical Nutrition* , 151-161.

Poulain. (2002). *Sociologie de l'alimentation : Les mangeurs et l'espace social alimentaire.*Paris: Presses universitaires de France.

Racette & al. (2008). Changes in Weight and Health Behaviors from Freshman through Senior Year of College. *Journal of Nutrition Education and Behavior*, 39-42.

Rogers. (1975). A Protection Motivation Theory of Fear Appeals and Attitude Change1. *The Journal of Psychology*, 93-114.

Ruud et al. (2005). Acceptability of stage-tailored newsletters about fruit and vegetables by young adults. *Journal of the American dietetic association*, 1774-1778.

Shepherd, Harden, Reesm Brunton, Garcia, Oliver & Oakley. (2006). Young people and healthy eating: a systematic review of research on barriers and facilitations. *Health education research*, 239-2257.

Sijtsema, Linnenmann, Van Gaasbeek, Dagevos & Jongen. (2002). Variables influencing food perception reviewed for consumer-oriented product development: critical reviews. *Food Science and Nutrition*, 565-581.

Sirieix. (1999). La consommation alimentaire : problematiques, approches et voies de recherches. *Recherches et applications marketing*, 1-22.

Soliah, Walter & Antosh. (2006). Quantifying the impact of food preparation skills among college women. *College Student Journal*, 729-739.

Steptoe, Perkins-Porras, McKay, Rink, Hilton & Cappuccio;. (2003). Psychological factors associated with fruit and vegetable intake and with biomarkers in adults from a Low-Income neighborhood. *Health Psychology*, 148-155.

Tomasone & al. (2015). Intentions and trait-self-control predict fruit and vegetable consumption during the transition to first-year university. *Journal of American College Health*, 172-179.

Treiman, Freimuth, Damron, Lasswell, Anliker, Havas, Langenberg & Feldman. (1996). Attitudes and behaviors related to fruit and vegetable among low-income women in the WIC program. *Journal of Nutrition Education*, 149-156.

Triandis. (1980). A comparison of the Fishbein and Ajzen and the Triandis attitudinal models for the prediction of exercise intention and behavior. *Journal of Behavioral Medicine*, 459-472.

Voorhess, Brady, Calantone & Ramirez. (2016). Discriminant validity testing in marketing : an analysis, causes for concern and proposed remedies. *Journal of the academy of marketing science* , 119-134.

4. Seminar article

Bauer. (1960). Consumer behavior as risk taking. In T. a. Francis, *Marketing: Critical Perspectives on Business and Management* (pp. 389-398). London and New York: Routledge.

Efron & Tibshirani. (1993). *Introduction to the Bootstrap.* United state of America: CHAPMAN & HALL/CRC.

Giraud. (1995). Vers un marketing alimentaire. *Congre International* (pp. 1083-1108). Reims: Association francaise de marketing.

5. Internet web site

(Kamdem), C. B. (2012, november 21). *Les effets des dimensions culturelles sur l'évaluation des produits domestiques : cas des produits d'ameublement domestiques par les consommateurs européens.*Récupéré sur Theses.fr: https://www.theses.fr/169311716

La-population-algerienne-a-42-2-millions-d'habitants au 1er janvier 2018. . (2018, June 27). Retrieved from Algerie presse service: http://www.aps.dz/algerie/75645

Lejeune, Aikaterinin Livydikou & Terekhina. (2009). *Alimentation méditerranéenne.* Récupéré sur yumpu.com: https://www.yumpu.com/fr/document/view/17128381/alimentation-mediterraneenne