Food Selection Through Life Span: Discrete Changes or Continuous Processes?

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Abstract

Food consumption is an essential activity at the center of human life; and food selection is the core. Finding and eating what is "food for me" is a complex activity depending on multiple factors—genetic, biological, psychological, sociological and cultural. Genetic and biological factors and nutritional knowledge alone are not enough to allow real predictions of what people will select and eat. Early learning, especially during infancy, childhood and adolescence, plays a major role in shaping individuals' choices and behaviors toward food. Most of the studies concerning food selection concern these periods of life. But data issued from those studies do not allow one to foresee what is going on later in adult and senior populations. The question one can ask is: Are the changes concerning food selection discrete, corresponding to specific periods of life, or continuous, involving learning, perceptional modifications and self-identity?

In the absence of comprehensive data bringing clear answers to these questions, three facets of the problem are discussed: What do we know? What do we think? What do we have to do?

It appears that we have to deal with a complex system involving learning, perceptional modifications and construction of identity. Early experience and education are important during development, but they do not allow predictions on later food selection. New directions have to be explored through multidisciplinary, coordinated studies.

Introduction

"Each human being experiences a food trajectory that begins with one food, milk, and expands to an incredible varied set of foods and preparations, attitudes, and food-related rituals. Food progresses from being a source of nutrition and sensory pleasure to being a social marker, an aesthetic experience, a source of meaning and metaphor and, often, a moral entity", Rozin reminds us (1). He adds that these transformations of food perception, as well as food practices, are directed mainly by culture-specific traditions.

Food consumption is an essential activity at the center of human life. It is vital for life and serves as a powerful agent of socialization, construction of self-perception, and acculturation. From this perspective, food selection is the core of this activity. Food selection is essential because it allows one to find and eat what is "food for me". Food selection is also a complex activity, depending on multiple factors—genetic, biological, psychological, sociological and cultural.

The tremendous advances in knowledge in the nutrition field acquired during the past few decades has allowed a better understanding of food intake and of normal and pathological processes underlying metabolic mechanisms. Promotion of public health, longer life expectancy and the treatment and cure of certain diseases are direct benefits from those scientific advances. But we clearly know now that genetic and biological factors and nutritional knowledge alone are not good predictors of what one will select and eat.

Food habits and food selection are learned. The main points that are learned include: what is food and especially what are "foods for me"; standards and norms concerning the taste of "my foods"; conditions of consumption and social eating; specific values and properties of foods. These learnings are influenced by the individuals' values, moral judgments, beliefs and cultural context, and play a major role in the construction of the self, self-image and self-identity (1, 2, 3, 4).

The bulk of research in the area of learning food perception and food selection has been done primarily with young populations: babies, children, adolescents and young adults. The data obtained from these studies are extrapolated to the rest of the population. This practice can be contested for two reasons: a) lack of consis-

tent data allowing one to consider whether the same determinants and processes of food selection are valid throughout the life span; b) lack of knowledge concerning the nature, mechanisms and determinants of food intake and their possible modification along the life span.

Are the changes concerning food selection discrete, corresponding to specific periods of life, or continuous, involving learning, perceptional modifications and self-identity? Taking into account the lack of comprehensive data to answer our question clearly, this paper explores three dimensions: What do we know?, What do we think?, What do we have to do?

What do we know?

If we consider the evolution of food selection with a developmental approach, it is clear that cut-off points exist and define different periods throughout the life span. In those periods directly connected with growth processes, for example, for newborns and toddlers, the immaturity and specificity of the digestive system limit the choice of foods. Similarly, during puberty, growth requirements and hormonal changes modify not only quantitative aspects of food intake, but also taste and other sensory perceptions.

The cut-off points can also occur as a result of continuous modification, as during the aging process, especially in the field of sensory perception. Taste and smell are considered to be more robust than the other three senses. Nevertheless, it has been shown that taste and smell thresholds, which seem to be very efficient until age 50 to 60, become higher after that (5,6,7). The elevation of threshold for smell is much greater than that for taste. For example, if detection thresholds for taste are three times higher after age 65, they are twelve times higher for smell. That means, according to Murphy and Cain (6), that correct identification of odors, which is about 70% at age 20, drops to about 30% at age 65, and probably continues to decrease with age.

This observation has led some scientists to hypothesize that loss of appetite, decrease of food intake and loss of pleasure in eating experienced by elderly

people could be a consequence of decreased sensory perception. One of the suggestions to increase appetite and food consumption in this population was to enhance odors of food. However, results are neither consistent nor convincing.

More recently, Rolls (8) examined the relationship between chemosensory changes and food intake in the elderly, working from the premise that such changes could affect nutritional status. She hypothesized that the decline in the ability to taste and smell can influence and change food selection or preferences, which can cause changes in food or nutrient intakes and subsequently lead to changes in body weight and/or nutrition-related illnesses. At the end of her meta-analysis she concluded that it is not clear if sensory modifications alone directly influence food preferences or nutritional status. The hypothesized model was not corroborated. The loss of chemosensory function may be so gradual that it has little effect on perception or intake of food. Thus the impact of chemosensory deficits on nutritional status is not a direct, nor a simple one, says Rolls; it depends on a number of social and environmental factors.

Aging, which is a continuous process, cannot be considered solely from a physiological perspective. Social and cultural factors, changes in the society as a whole, and subjects' self-perception must also be taken into account.

Considering the multiplicity of factors that play a role in food habits and selection, one can ask if modifications of food choice during a subject's life span are dependent on generation aspects or on life cycle aspects. In a recent study Volatier (9) reported some interesting data using an econometric approach. Life cycle aspects are related to periods of life, that is, the age of subjects. Generation aspects are related to the fact of having a specific age at different moments of the century. For example, being 20 years old in 1930 or 1960 implies different life and environmental experiences and different cultural references. The general data came from the national survey of food consumption in France, done by the National Institute of Statistical Survey of France (INSEE).

Volatier studied variations of food consumption for 56 groups of food in five cohorts of different ages (the oldest born between 1907 and 1916, the youngest between 1947 and 1956) during the period from 1971 to 1991. It is a semi-longitu-

dinal survey, with a span of ten years between cohorts. Results show a bigger complexity, including more determinants, than the two initially identified.

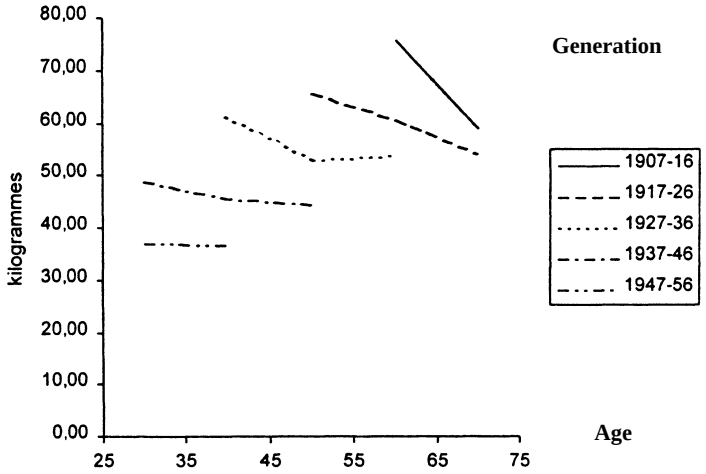

Figure 1 - Individual consumption of bread - From (9)

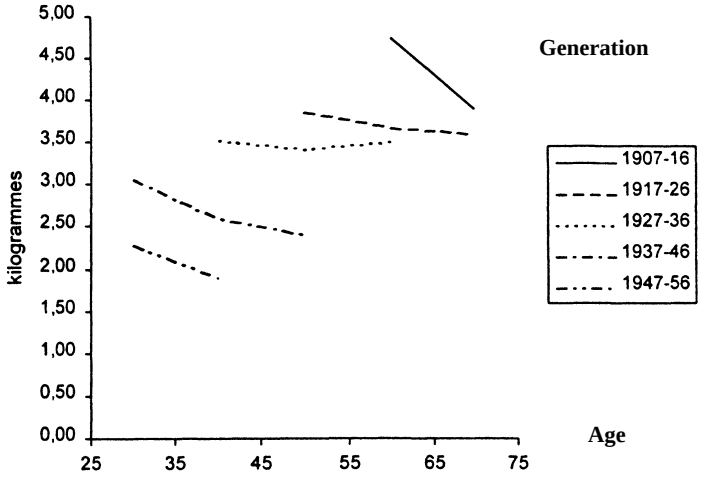

Figure 2 - Individual consumption of fresh vegetables - From (9)

Clearly, the generation aspect plays a role in the consumption of several products: bread, wheat flour, cauliflower, leeks and fresh fish. Figure 1 shows that consumption of bread depends on periods of education (generation). Consumption of bread goes down over time.

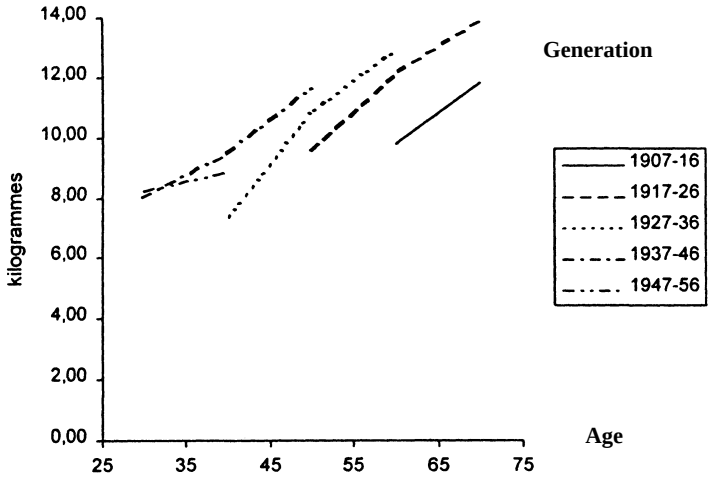

Figure 3 - Individual consumption of fresh tomatoes - From (9)

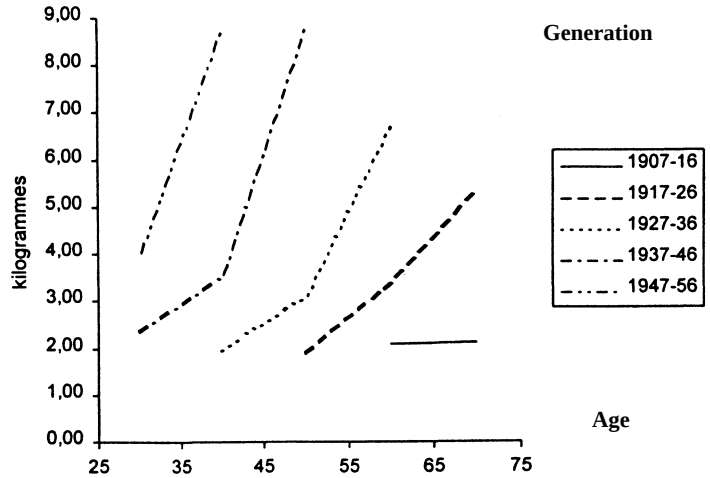

Figure 4 - Individual consumption of ready-made plates - From (9)

But the life cycle aspect also plays a role. Consumption of fresh vegetables increases with age and shows a positive slope (see Figure 2). This is true also for fresh fruit, fresh fish products and some specific alcoholic beverages.

The generation aspect and the life cycle aspect do not explain all the variations observed in this survey. Consumption of other products seems to be influenced by the general evolution of society, especially concerning the availability of products. For each cohort there is an increase in the consumption of fresh tomatoes, rice, sodas, etc. (see Figure 3).

The effect of technology and the availability of new products can be observed through consumption of ready-made plates (see Figure 4). This is a specific illustration of learning to accept a new product and making new selections related to technological advances.

It is clear that these data have to be interpreted with some caution. Data and trends are indeed very interesting and heuristic, giving indications about complex phenomena that combine individual aspects (age, generation) and global aspects of the society (availability of products and convenience of preparation). But data come from macroeconomic surveys, handling huge populations and considering consumption averages only.

To this we have to add, in order to get a better understanding of underlying mechanisms, specific studies focused on perception mechanisms: How do people perceive food throughout their life span? How does "my typical food" change as people age? How does self-perception evolve throughout the life span? Few survey data on this topic are available. While it is clear that sensory and biological factors may influence food choices, they are strongly dependent on perceptional mechanisms that play a major role in individual self-perception and identity.

What do we think?

Under this question two directions have to be considered: what everybody thinks and what scientists think.

Thinking about food includes both knowledge and beliefs. Knowledge can be viewed as factual, objective data, that is, more or less, science. Beliefs do not depend on this kind of data to be effective. Ideational aspects and perceptions of food, magical thinking, moral values and religious proscriptions are the main components of beliefs (1,10,11).

Food is usually thought to concern specific populations (it is for babies, for aged people, for me, for foreigners), to have specific qualities (it is good for health, for heart, for lungs, for strength against something) or to have magical powers (herbs preserve the spirit of plants and give it to you; eating a lion makes you strong; eating raw meat makes you aggressive).

In fact, everybody's perception of food is a mix of beliefs, objective data and interpretation of those data. It is a complex phenomenon, well illustrated by present fears about food in western populations. Perception concerns senior populations, in particular, who often develop self-prescribed diets for themselves.

The question of what scientists think concerns the role of learning and early education in later behavior. For most scientists and most people in general, it is quite clear and self-evident that "what happens to a child in the early years must make him or her into the kind of person he becomes later on" and "the very idea that child-rearing practices would not shape the personality of the child is shocking to us" (12).

The idea of the power of early education and the permanence of childhood acquisitions through the life span is largely to be considered true. Pediatric literature, theories of personality, biographies and autobiographies converge to reinforce this belief (2,3,12).

At the same time, objective data from longitudinal studies, which are the only means to prove this hypothesis, are scarce and poor. Only one longitudinal study (Kagan and Moss, 1962, quoted by Riesman, (12)) spans a period beginning as early as preschool and continuing beyond adolescence, to young adulthood. In this longitudinal study the only salient and predictable traits, correlated to education, were linked with gender. It was possible to say that girls will act later as women, and boys as men, which is a general cultural stereotype. In other words "…both the modifiability and consistency of personality can be partially understood within the context of social and cultural norms".

Riesman (12), psychologist and ethnologist, carried out several studies in Africa. He looked at two populations from the same educational system devoted to children but with completely different styles of being and personalities as adults. He compared all the parameters between the different populations to the American way of life and education. The sociocultural theory he developed does not deny the importance of childhood but suggests that childhood is significant for personality in that during this time the person establishes relationships with his relatives. Instead of paying attention to personality as a set of traits or qualities a person has, he considers the construction of a person's sense of self. "The sense of self is not once and for all shaped by childhood experiences but is the direct perception of how one is related to the rest of the world, which includes not only relatives but the larger society one belongs to ... For this reason the cultural interpretations of the social structure one lives in, of social relations and of nature are crucial for any person's sense of self and thus for the personality he will exhibit." (12).

Riesman's position is very important to us because he allows a large degree of malleability to personality. In light of this work we can better understand the place and the evolution of the concept of self in adults and older populations: on the one hand, they have to adapt themselves to the evolution and modification of society; on the other hand, and in spite of aging, they have to maintain a consistent and positive perception of their self. "Who I am" is a major factor in the process of choosing the "food for me".

What do we have to do?

It appears that, henceforth, we have to consider

- that food selection is a complex, multifaceted process;
- that the process is not a simple one, nor monotonous; and
- that self-perception, self-identity and self-image are major aspects involved in the mechanisms of food selections by adult and senior populations. Food cannot be accepted if it is not "for me", i.e., coherent with the self- and cultural-perception of the person.

It is only by taking the foregoing into account that new directions for surveys and experimentation emerge. Studies have to be multidisciplinary and coordinated. Further work can allow us to better understand food selection throughout the life span. This understanding seems to be the condition needed in order to develop more efficient, practical approaches and better strategies of education and prevention.

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Biography
Matty Chiva

Pr. Matty Chiva was graduated from the Sorbonne, University of Paris (1961) as Clinical and Psychopathological Pyschologist and Educational Psychologists, has a Diploma from the National School of Oriental Languages (1962), has a Ph. D. in Psychology from the University of Paris V – René Descartes (1971) and a Doctorat d'Etat from the University of Paris X – Nanterre (1979).

Pr. Chiva was researcher in clinical psychology at Ste. Anne Hospital in Paris (1962-1981) and Senior researcher at the CNRS (1967-1981).

He became full Professor at the University of Paris X – Nanterre from (1981-1999) He has been Professor emeritus, since september 1999.

He is member of several professional and scientific associations, including Institut Français de Nutrition (IFN), and is one of the founders of the International Society for research on Emotions (ISRE). He is also a member of the Danone Scientific Advisory Commitee, of the Mars Nutrition Research Council and advisor for the French Ministry of Agriculture.

Pr. Chiva received two prizes, an international one (1993) and a French one (1997), for his scientific contribution on the field of food selection.

Current areas of research :

- Construction of the perception of food as a social object
- Sensory aspects, emotion, hedonics and food acceptance
- Methological approaches evaluating roles of organoleptic, hedonic and ideational aspects and perception of food
- Olfaction ,emotion and hedonics aspects in memory processes
- Food selection, food intake and educational programs for adolescents and old people