

## Article

# Toward Achieving Sustainable Food Consumption: Insights from the Life Course Paradigm

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**Abstract:** Trends in world population growth have created an agri-food demand that is unsustainable under the present resource-intensive agricultural systems and expected growth in income levels in many developing countries. As such, research and policy making related to sustainable development have focused on consumption. One major approach to sustainable consumption lies in shaping food demand that would require changes in people's present food consumption habits that are excessive and unhealthy, leading to overweight and obesity. In order to change food consumption habits, one must understand the factors that lead to their onset and change. This article offers the life course paradigm, which is increasingly used by social and behavioral scientists to study the development and change of various forms of behavior, as a research framework for studying the onset and change in food consumption habits. It shows how the life course approach could help guide future research not only on sustainable consumption, but also on environmental and social sustainability.

**Keywords:** life course; sustainability; sustainable consumption; food consumption; eating habits

## 1. Introduction

Sustainability typically refers to actions that meet “the needs of the present without compromising the ability of future generations to meet their own needs” [1] (p. 684). The key idea behind this concept is innovation and proactive decision making with the objective of maintaining a balance between ecological stability, economic growth, political justice, and cultural vitality to make sure that the world is harmonious for all inhabitants. There are three key dimensions of sustainability: Environmental sustainability, economic sustainability, and social sustainability. Environmental sustainability focuses on non-renewable resource depletion, pollution, and the use of renewable resources. Economic sustainability focuses on issues related to levels of economic growth, production, and consumption that can be supported indefinitely. Social sustainability focuses on the ability of the social system (community, country, or the whole of humanity) to function at any specific level of social well-being perpetually and, if possible, ways to improve it [1]. (For a historical perspective on sustainability and its dimensions, see for example [2]).

The three dimensions of sustainability are interdependent and reciprocally influenced. For example, economic development leads to society's overconsumption that impacts the environment and level of social well-being. Expansion in food production systems have responded to the increases in the Earth's population, and raising incomes have caused damage to the natural environment. They have also contributed to changes in the type and quantity of food consumed, causing increase in the incidences of overweight and obesity globally [3,4]. These changes are believed to have been in part due to increasing urbanization that has shifted the dietary patterns toward energy-dense and high-fat diets

and resulted in sedentary lifestyle, as it has been observed in many Asian countries [5]. These trends are expected to continue, especially among less developed countries, as it has been the case of South Africa [6] and Philippines [5], as the less-developed countries continue to develop their economies and increase their people's standard of living.

Therefore, to address issues of sustainability, one must focus on all three dimensions. Yet, the major scope of previous efforts to address sustainability issues has been myopic and rather narrow. For example, educational institutions that have degree and research programs, such as Columbia University's Masters of Science in Sustainability and the Earth Institute, that have been conducting and applying interdisciplinary scientific research, are all aimed at training a new generation of problem solvers in industry and government. Although millions of workers and dedicated activists have been striving to reduce the ecological footprint, the likelihood of achieving environmental sustainability appears to be low in view of continuing overconsumption, environmental degradation, and climate change. Moreover, the political will to achieve the same seems to be declining as well.

Sustainability is a complex problem that has challenged decision makers for decades. One of the key reasons for the lack of clear understanding and resolution to challenges presented by sustainability is because not many people have attempted to do root cause analysis of this complex problem. Root cause analysis incorporates multiple approaches, tools, and techniques to reveal causes of problems. With respect to food consumption, sustainable food and agricultural production require significant transformations towards "holistic" approaches that focus on all three dimensions of sustainability. One major approach to sustainable food consumption lies in improving the present dietary habits that lead to overweight and obesity, often causing other medical complications (e.g., diabetes) that affects the person's health and well-being [4]. Thus, shaping food demand would require changes in people's consumption habits [4].

In this article, we adopt a broader perspective on addressing sustainability issues. We view the roots of the problem not merely as a corporate or government affair, but as a societal issue as well. Humans as consumers and decision makers in various roles and capacities, and are to a great extent responsible for their behaviors that affect their present and future well-being as well as the well-being of future generations; and they affect government and corporate actions that have implications for sustainability. Our argument is parallel to that of others who have been addressing sustainability issues, but come short of proposing actions. For example, in line with views of Thwink.org, the goal of all human beings should be to optimize quality of life for all individuals presently living and their future descendants. Implicit in this view is the assumption that people should take responsibility for their own welfare and the well-being of their descendants; and present generations living on planet Earth should ensure that future generations also enjoy the levels of welfare and well-being as those available to them during their lifetime. With respect to food consumption activities that affect the Earth's resources and people's quality of life, these notions beg answers to the following research questions:

1. How do people's food consumption habits affect their well-being and the well-being of future generations?
2. How do food consumption habits of citizens of nations promote or degrade the availability of resources needed for the well-being of people living presently and that of future generations?
3. If certain food consumption habits are desirable for environmental and social sustainability to ensure the well-being of people living presently and that of future generations, how should governments and social agencies go about instilling such habits in their citizens' daily habits?
4. What are the effective mechanisms through which citizens develop or go about changing food consumption habits that optimize the quality of life of people living presently and that of future generations?

Every country's need to address these questions is urgent and timely in light of the Earth's population growth. The total population of the world is expected to reach nearly 10 billion in 2050, and 11.2 billion in 2100, creating agricultural demand that is unsustainable under the present resource-intensive agricultural systems and expected growth in income of people living in low- and middle-income countries [3].

The main purpose of this article is to present the life course paradigm (LCP), which is increasingly used by social and behavioral scientists to study a wide variety of phenomena, as a framework for studying the transformational role of food consumption in improving consumer well-being and the preservation of agricultural resources. First, the article presents a conceptual model of food consumption based on the elements and tenets of the LCP. Next, the article uses two examples related to over-consumption—binge eating (as a compulsive behavior) and obesity (as outcome of unhealthy eating habits)—to illustrate the value of the model for studying the onset and change of these food consumption habits. Finally, the article provides directions for future research that would generate information helpful in public policy formulation and intervention. Although this article does not show how the research questions and goals of interest could be achieved in every country, it is hoped that it offers a viable conceptual research framework with illustrations that could serve as a blueprint for researching country-specific sustainability issues.

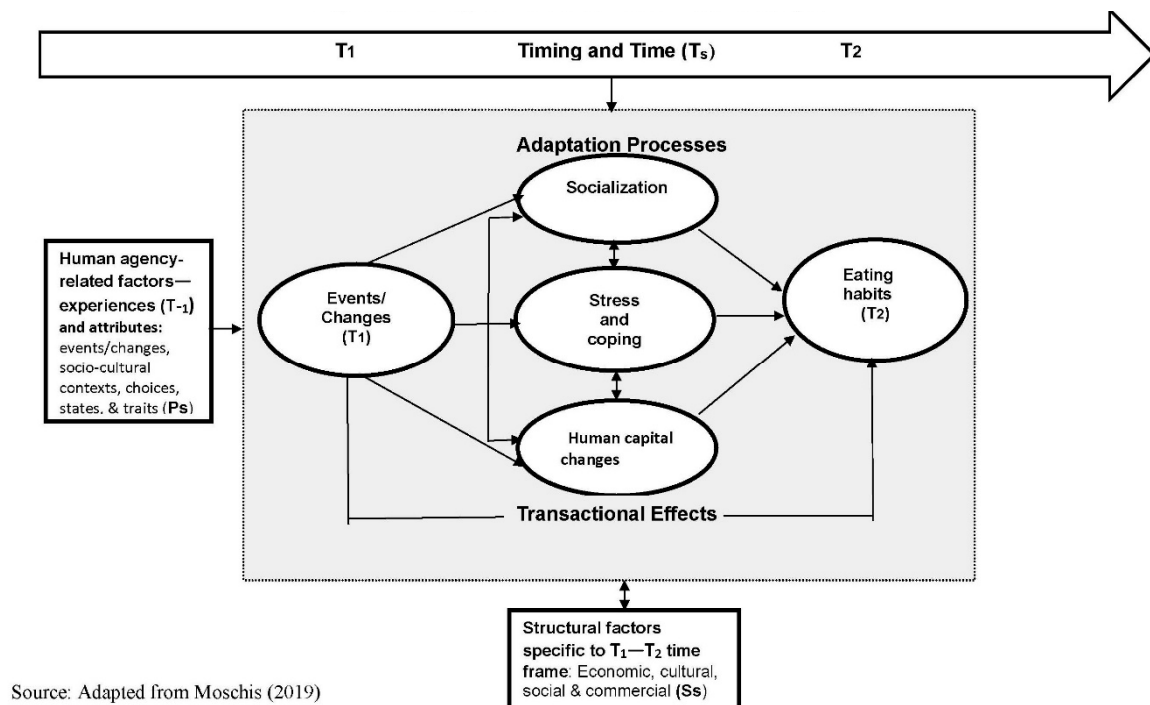
## 2. The Life Course Paradigm

The LCP has been called “one of the most important achievements in social science in the second half of the 20th century” [7]. It has been used extensively in recent years as a multi-theoretical and interdisciplinary research framework to address substantive and theoretical issues of the social and behavioral sciences [8–10]. Although the LCP has its origins in developmental psychology and sociology cf. [10], it can be seen in more recent theoretical formulations of psychologists, sociologists, anthropologists, demographers, and others in several fields of positivistic and humanistic endeavors [10–12]. The LCP draws from many theoretical and conceptual streams and has developed into an interdisciplinary program for studying various types of phenomena of interest to scientists in several disciplines. Its evolution has been the outcome of three main trends as well as recent methodological developments cf. [10]: First, the study of human behavior over the person's entire lifespan; it was facilitated by the increasing availability of longitudinal data and the development of new methods of analyzing time-dependent phenomena, such as event history analysis (EHA), that are suitable for life course research [13]. Second, the integration of theories in different disciplines into multi-theoretical frameworks. For example, developmental and socialization models were integrated into the broader life course model [8,14]. Third, the emergence of interpretive science from dialectic models that emphasize subjective orientations and underscore humans' ability to influence their environment. This development has contributed to a better understanding of various phenomena of behavioral and social sciences; and it has offered a variety of methods that complement quantitative methods of life course research, e.g., [15,16].

The life course approach to research has diffused rapidly across disciplines, and the number of life course studies has increased exponentially during the past three decades [10]. It is presently widely used across disciplines and internationally, e.g., [17]. As of the end of the first decade of the 21st century (year 2009), the ISI Web of Science contained 4528 publications with “life course” as a key word; and there were 54 disciplines and subject areas that had at least 20 publications each [10]. The LCP has been employed by researchers in dozens of countries to study various types of consumption phenomena, ranging from effectual consumer choices to maladaptive consumption activities for studies, see, e.g., [10,18–20].

The model described herein represents a revision and expansion of an earlier life course model [21] that was originally developed to study various forms of maladaptive consumer behavior (for these studies, see [10]). The life course food consumption model shown in Figure 1 has been adapted from the general life course model [10], which has been employed in several recent life course studies in the

consumer field [18,19]. It classifies the variables appearing in life course studies in various disciplines into two broad sets or groups of elements, which are graphically shown in Figure 1 and discussed in greater detail in the specific context of food consumption in the next section.



**Figure 1.** A conceptual life course model of food consumption.

The first group of elements comprises three main types of variables that constitute the main components of the life course model. The first type consists of events or changes that people experience at a specific time or stage in their lives ( $T_1$ ); they can be in the form of both expected changes (e.g., retirement) and unexpected events (e.g., natural disasters). The second type of variables consists of three adaptation processes that are often triggered by these experienced or anticipated events or changes. The three interdependent processes are: Socialization processes (e.g., acquiring knowledge and skills from various sources); coping responses to stressful circumstances (both acute and chronic stress); and changes in human capital in the form of growth or development and decline in cognitive resources (e.g., knowledge and mastery). The third type of variables in the life course model consists of outcomes of the three processes and earlier in time events and experiences that happen at later points in time ( $T_2$ ); these are also considered as events or changes and are the result of the direct and indirect effects of experienced life events (at time  $T_1$ ). Events (at time  $T_1$ ) and outcomes (at time  $T_2$ ) may take the form of single choices, abrupt or gradual changes in thoughts and behaviors, such as changes in eating habits. There is a great degree of interdependence between many events that people experience and adaptation processes because experience of one can increase or decrease the likelihood of another.

The second group of elements in the life course model is comprised of three types of contextual factors that together describe the circumstances that people have experienced and are embedded in: (a) The timing of events or changes defined by the age at which a person experiences each of those events, and the duration of events or length of time one has experienced each of those events that is measured in various units of time (e.g., months, years) ( $T_s$ ); (b) human agency-related factors represented by individual characteristics (e.g., attributes, traits) and experiences at earlier stages in life (at  $T_{-1}$ ) that include social and cultural circumstances as well as changes/events and choices a person has made; and (c) socio-structural contexts (e.g., market conditions, family and social structure), both stable and fluid, that a person experiences during the  $T_1$ – $T_2$  period of time.

The key idea of the LCP is that development, stability, and changes in thoughts and actions of individuals are not random occurrences, but they systematically relate to life events or changing life conditions that a person experiences. These life events include choices people make, and biological, psychosocial, and environmental changes, both expected and unexpected; and they necessitate adjustment to new life circumstances and lead to changes in thoughts and actions. In contrast, when people do not experience life events, they tend to maintain stable patterns of thoughts and actions [22]. The manner in which a person experiences, interprets, and responds to various changes (events) that occur at  $T_1$  and adapts to them over a period of time ( $T_1$ – $T_2$ ) is moderated by the three types of contextual factors shown outside the shade area—i.e., event timing and duration, human agency-related factors, and the changing socio-structural environments experienced by the person during a specified time frame (i.e., during  $T_1$ – $T_2$ ).

People respond and adapt to changes they experience throughout their lives; and they are active in making choices that shape their life course (e.g., marriage, retirement). Their responses at any given time (at  $T_1$ ) are within individual constraints (e.g., biological, financial) and structural factors (e.g., market conditions). Individuals' responses and choices over time (i.e., during  $T_1$ – $T_2$ ) are not only conditioned by their social and structural environments, but also help shape these contextual factors.

### 3. Food Consumption in Life Course Context

According to life course research, the various changes people experience, responses to those changes, or choices they make can be considered as experienced events. Adaptations to experienced events and changing life conditions, in turn, determine change or continuity in various areas of a person's life (e.g., education, work, family) that represent the trajectory one's life may take [17]. Many events can create turning points in a person's life course and cause alterations in life trajectories and the establishment of new ones.

When these notions are applied to food consumption, many choices people make about the food products they eat can be viewed as either a continuity in the same food consumption state or as a transition into a different state that defines a person's food consumption trajectory. For example, one's discontinuity in meat consumption can be considered as an event that marks the person's transition into a new food consumption state where he or she assumes the role of a vegetarian. In addition, the duration at the state or role (i.e., length of time being a vegetarian) determines one's food consumption trajectory as a part of his or her entire consumption trajectory that contributes to the formation of the person's general life course trajectory.

Thus, assumptions of the general life course model about experiences of and adaptation to life events could also be applied to the study of behaviors and roles relevant to food consumption, as in the cases of becoming a vegetarian and obese that can be viewed as events and mark transitions into new roles or states. Consumers' responses and adaptation to different food consumption experiences are similar to their adaptation to other life experiences. Therefore, stability and change in eating habits can be studied within the context of the general conceptual life course model.

Figure 1 graphically shows an overview of the proposed conceptual model of food consumption habits based on the core assumptions of the LCP; its main purpose is to demonstrate how researchers can use the life course approach to study food consumption habits by using select variables from the general conceptual model described in the previous section and presented in greater detail elsewhere [10]. Previous research related to food consumption is interpreted within this model; it is used to identify relevant variables from each category of the conceptual life course model, present gaps in knowledge, and provide directions for future research. The presentation focuses primarily on factors that lead to overconsumption of foods during adolescence because this life stage is a critical period in the development and persistence of maladaptive eating habits [23,24].



### 3.1. Maladaptive Eating Habits ( $T_2$ )

“Maladaptive” or “antisocial” behaviors refer to actions which are not consistent with prevailing social expectations and are likely to have adverse effects on the individual, his or her family, or the society [25–27]. Among the many maladaptive behaviors related to consumer behavior, are several forms of addictions to products and services (e.g., drugs, alcohol), various forms of anti-social and risky activities (e.g., drunken driving, shoplifting), and several types of compulsive behaviors (e.g., gambling, overspending) [26,28–30]. Maladaptive consumer behaviors can also include those related to food consumption that have adverse effects on the individual, his or her family, and society; they include binge eating, which is considered as a form of compulsive behavior [17], and other eating habits that lead to obesity [31].

There is compelling evidence to support strong linkages between childhood and adulthood of individuals. Researchers across multiple disciplines have attempted to explicate the mechanisms behind these linkages [25]. Despite the evidence supporting the importance of childhood experiences in later life, relatively little is known about strength and nature of the relationships of childhood adversities to adult maladaptation, the specific mechanisms that account for them, and the conditions under which they hold [25]. Similarly, although it is recognized that compulsive behavior is entrenched (at least partly) in life experiences of people early in life, little is known about the processes that link early-life experiences to this form of maladaptive consumer behavior [31,32].

We contend that the LCP [8,17] is a viable framework for studying the connection between childhood-adulthood experiences and behaviors. It has been used to study the development of compulsive buying [33–36] and other forms of the impulse-control disorders [26,27], and seems suitable for studying other types of maladaptive consumer behavior such as the impulse-control disorder of binge eating.

Furthermore, the LCP appears to be appropriate research framework for studying the development of eating habits which lead to the undesirable state of obesity. Our view that this conceptual framework is suitable to the study of development of obesity is consistent with observations and suggestions of other scholars who have studied this topic [12,37,38]. For example, in support of our contention, Macmillan and Furstenberg conclude that “understanding the developmental features of obesity is crucial to contemporary public health and a life course perspective offers a uniquely powerful framework for understanding its epidemiology” [38] (p. 542).

A theme that has emerged from earlier studies of maladaptive behaviors that have employed the life course approach is the importance of contextual factors, especially agency-related factors (e.g., personality, income) and structural factors, particularly factors related to specific countries, in affecting the mechanisms responsible for the development of patterns of such behaviors [10]. This finding underscores both limitations and opportunities in using the LCP to study maladaptive eating habits of people in different countries. The model is not only limited in offering theories that link context to outcome, but also in understanding research findings that show linkages between contextual factors and eating habits. For example, in the context of food consumption, although the agency-related factor of heredity may affect a person’s likelihood of becoming obese, it is not clear whether the effects of genetic factors are direct, indirect, or moderate compared to the effects of other factors [39]. Similarly, the effects of income on food choices are not well-understood [40]. Furthermore, it is not clear whether country-related effects are direct or operate via adaptation mechanisms. For example, Ramachandran et al.’s literature review [41] concluded that urbanization and economic development in Asian countries contribute to an increase in obesity and related complications, but it is not clear whether the increase is due to changes in people’s choices (e.g., changes in dietary habits and lifestyles [5]), changes in the environment (e.g., increase in the availability of, or access to, fast-food outlets that differs between and within countries [42]), or both (e.g., fast food restaurants clustered near schools are heavily patronized by high school students who often make poor nutritional choices [43]). It is also not clear whether eating habits are due to interactions between agency- and structure-related factors,

as a study in Kenya revealed that obesity was most prevalent among urban women in the high-income group [44].

Lastly, while examination of country-related differences at a macro-level appears to answer questions regarding the prevalence of obesity and eating disorders commonly attributed to differences in the levels of economic development and urbanization of different countries, the macro-examination approach leaves much to be desired; it falls short of explaining the reason(s) food intake in some developed and highly urbanized countries, such as Japan, is not a factor in obesity [45]. Thus, previous observations and explanations of increasing obesity rates based on “westernization” of developing countries [46] may not be generalized. A micro-level analysis might be needed to enrich understanding, and the LCP offers a viable framework for examining the mechanisms that promote or deter the development of unhealthy eating habits. For example, differences in obesity rates between the developed countries of the United States and Japan might be due to differences in family environments and socialization processes [30]. Compared to families in the United States, Japanese families are more intact and maintain greater control of their children’s consumption activities [32,47]; and differences in family structure and socialization styles could explain the differences in obesity rates of children in these countries. Not only are children more likely to eat healthier foods in the presence of adults [30], but also the late development of independent consumption as a socialization practice in Japanese families [47] may deter the development of unhealthy eating habits during developmental years. The greater warmth toward their children shown by Japanese parents [30] may also lead to a stronger self-esteem [48] and fewer stressful family episodes, which deter the development of excessive food consumption habits [23,49].

Thus, to illustrate the value of the life course paradigm to the study of food consumption habits, we focus on the onset and development of maladaptive eating habits. Not only do these habits have negative consequences on the well-being of current and future generations (i.e., social sustainability), but also the maladaptive eating habits of binge eating and of those which lead to obesity (e.g., excessive food consumption) have adverse effects on available food supplies (i.e., economic sustainability) and natural resources (i.e., environmental sustainability). The LCP, whose components and assumptions are exemplified in the conceptual model shown in Figure 1, is used to study the onset, development and change of these maladaptive forms of behavior (observed at  $T_2$  in Figure 1). Thus, stability and changes in eating habits are assumed to be the consequence of the direct and indirect effects of life events experienced (at  $T_1$ ) and adaptation processes (during  $T_1$ – $T_2$ ). They are also the result of the direct, indirect, and moderating effects of the contextual variables. In the following sections we show how life course tenets can be employed to study the common and necessary activity of food consumption (eating). This common consumption activity has the potential to develop into the maladaptive forms of behaviors (e.g., over-eating, binge eating, poor nutritional habits) that lead to obesity and adversely affect the well-being of present and future generations, agricultural resources, and the environment [30], underscoring the importance of food consumption for the study of sustainability.

### 3.2. Development of Binge-Eating Tendencies

Early studies have suggested that the development of compulsive consumer behaviors are the end results of the person’s experience of events related to family dislocation (e.g., divorce and separation of parents) during developmental years [32,50]. Although these studies do not explicitly employ the LCP, they imply life course notions by linking changes in family structure during the person’s adolescent years to his or her compulsive behavior indirectly via the stressful family events of divorce or separation. However, several recent studies in many countries have examined the development of compulsive consumer behaviors from a life course perspective [20,33–36,51,52], and have provided additional insights into the development of the compulsive behavior of binge eating.

### 3.2.1. Life Course Explanations of Binge Eating

According to the normative adaptation perspective (Figure 1), parents play an important role in socializing their children to socially-desirable norms and keeping them from engaging in socially undesirable behaviors [33,36]. However, children's exposure to extended periods of disruptive family events (e.g., divorce, loss of a parent) interferes with effective socialization and weakens parent-child bonds [48]. Such events have negative consequences on the child's emotional security and self-esteem [48] due to reduction of intangible resources in the form of parental warmth, understanding, and caring [36,48]. The adverse emotional consequences of reduction in such intangible resources weakens development and promotes the onset of impulsive behaviors [53,54] that lead to compulsive behaviors [54,55].

According to the stress adaptation perspective, behavior is the outcome of stressful life experiences. To reduce stress, people use specific thoughts and behaviors as coping responses, and those thoughts and behaviors that are effective in reducing stress are likely to be reinforced through learning processes; they tend to develop into individualized sets of strategies over the life course [56] and become conditioned responses that lead to habitual behaviors (e.g., preferences for quantities and types of food at  $T_2$ ) that reflect behavioral adaptations [57]. The stress perspective further suggests that life events representing a disruption in family life (e.g., loss of a parent, divorce, separation) also increase the risk of experiencing additional interdependent and transactional life events of various durations (e.g., lengthy financial hardship, family discord, relocation) [9] (Figure 1). Research shows that the young person's continued experience of such stressful life events over a long period of time may increase levels of chronic stress experienced [58] and lead to the development of compulsive disorders, such as binge eating [59].

According to the human capital adaptation perspective, development of maladaptive forms of behaviors is the result of impaired or inadequate human capital development [48,54,60]. Divorce or loss of a parent can lead to reduction in family income that, in turn, leads to parents' use of limited resources and the need to exercise greater control over their child's use of limited financial resources [48]. Families who employ controlling socialization practices may delay the development of human capital (e.g., cognitive skills), as research shows that children who are brought up in controlling family environments rear children who lack adequate self-control and are oriented toward hedonically gratifying behaviors [53,61]. Individuals with impaired development of human capital are more susceptible to impulsive choices [26] that are also precursors to compulsive behaviors [54,55].

### 3.2.2. Directions for Future Research

The development of maladaptive forms of behaviors is gradual and subject to contextual influences. That is, certain individuals are at risk for developing such consumption habits because of social circumstances they face and their background or high-risk periods [29,62] that make the influence of certain factors in the life course model salient. To illustrate, one can consider initiation of smoking as an event. Because nearly all smokers are at risk of developing this maladaptive habit during adolescent years [55,63], timing (age) and time (duration) become important dimensions of theory and analysis. The likelihood of onset is higher during adolescent years ( $T_1$ – $T_2$  time frame in Figure 1) than during any other period of time. Upon entering adolescence, the young person's risk of the onset of the smoking habit increases each year that lapses (i.e., it becomes duration-dependent). In a parallel vein, since certain eating habits have been considered as self-indulging coping responses to stress [49], the greater risk of acquiring unhealthy and excessive eating habits are expected to be during periods that a person experiences stressful events and circumstances over long periods of time. For example, prolonged exposure to adverse family events during childhood years likely leads to the development of eating as an uncontrollable form of behavior—hence excessive and compulsive [64].

Thus, researchers who wish to understand the development of binge-eating tendencies in young people should consider the effects of family disruption events and their effects of parenting strategies. In response to these events and subsequent socialization strategies, the timing and duration of these



experiences likely impairs the child's self-esteem and intangible family support that may lead to the development of binge-eating tendencies. Therefore, future research on binge eating using the LCP could benefit by considering both the timing (i.e., age) and duration of family adversities that the young person experiences during his or her formative years; these experiences should be examined not merely as stressful events [32], but also for their effects on the adaptation mechanisms that may promote or deter the development of binge-eating tendencies.

### 3.3. *The Onset of Obesity*

Previous studies of obesity have been primarily descriptive, focusing either on individual characteristics or environmental factors that promote or facilitate eating habits that lead to obesity. In the first category, one finds studies that correlate agency-related factors with obesity and sustainable consumption; they include psychological factors such as personality [65–68], demographic characteristics such as age and education [68], and genetic factors [39,67]. Although these factors are useful in profiling obese persons and predicting the likelihood a person will become obese, they have little explanatory power; they provide limited insights into the process(es) that bring about change in body weight. For example, although it is believed that genetics affect obesity, it has been suggested that such effects are indirect rather than direct, moderating the effects of other factors [37]. Similarly, it is not clear how or why income correlates with food choices or eating habits, such as preferences for large portions of foods [40].

Another set of studies focuses on environmental or socio-structural variables that affect unhealthy eating habits or the undesirable outcome of obesity; they view consumers of food products as reactive to situations or circumstances within which they are embedded. For example, obesity rates are higher among those who eat frequently at restaurants in general [69] and fast food restaurants in particular [42,43]; and they are higher among those living in urban areas [44] and originate from Middle East and North Africa countries [70]. These, as well as other studies that show the effects of physical environments on obesity [67,71] offer limited insights into the reasons these factors relate to obesity. For example, because frequent fast food intake leads to increased body weight and obesity [72], it is not clear whether those who heavily patronize fast food restaurants cannot afford higher quality of foods or are likely to make poor nutritional choices [43]. Similarly, it is not clear whether the higher obesity rates among those originating from Middle East and North Africa countries are due to cultural factors (e.g., social weight norm [73]) or due to their higher frequency of eating unhealthy foods [70].

To summarize, previous studies on obesity have produced interesting information about the characteristics of people who are obese and the factors that are associated with obesity, but they have fallen short of explaining the reasons that promote obesity. Relatively little is known about the reasons many persons become obese, the likelihood of the onset of obesity, the circumstances that promote obesity, and the mechanisms or processes that lead to body weight increase and subsequently to obesity. Previous studies do not provide information helpful in filling these gaps in knowledge in part because these studies tend to be static. In particular, information on the process(es) that lead to obesity is in short supply.

#### 3.3.1. Life Course Explanations of Obesity

Studies that focus on the onset of obesity within the life course paradigm, especially on mechanisms responsible for development of obesity, are sparse and myopic. Moore et al. (2017) [31] propose a model of family influences on obesity during childhood and adolescent years that is in line with the normative adaptation perspective (Figure 1), with family socialization practices as main elements of this model. This model is comprehensive and rich in ideas, albeit limited because it focuses on factors that promote obesity in early life. Because socialization is a life-long process and the onset of obesity can occur at any stage in life, the Moore et al.'s model can be integrated into the multi-theoretical life course model, as socialization research in recent decades has been cast into the LCP (cf. Elder 1994 [14]). By incorporating this socialization model of childhood obesity into the LCP, researchers

could study the onset of obesity at any stage in life. They could benefit by examining the onset of obesity as a dynamic process over the person's entire lifespan, focusing not only on family, but also on additional socialization processes and other factors suggested by the general conceptual life course model (Figure 1).

The family socialization model presented by Moore and colleagues acknowledges that socialization processes change or evolve over time, but it falls short of specifying the specific changes, how, and the reasons these changes occur. In a similar vein, the developers of this model appear to implicitly acknowledge the cumulative effect of events that define family transitions, such as stages in the family life cycle, and affect family socialization practices and stress processes, in line with the LCP, but they are far less explicit regarding the impact of these factors on obesity. Furthermore, the impact of additional factors known to play important role in promoting obesity, especially contextual factors (e.g., social, cultural, structural), are not addressed in the Moore et al.'s model, despite evidence that illuminates the importance of these factors (e.g., see studies cited in the previous section).

It is well recognized that the family plays an important role in shaping the food consumption habits of children, as asserted by Moore and associates. Yet, the processes by which parents affect the food consumption habits of their children are not adequately illuminated. Moschis [74] presents evidence of the effects of the quality or styles of parent-child communications on the development of various types of desirable and maladaptive consumption-related behaviors. Using the LCP, research by Baker and associates [36] points to the importance of the direct and indirect effects of family socialization in the form of communication with their children. They find that a socio-oriented family communication style, which places emphasis on obedience and conformity to the parent's desires, predicts excessive consumption among adolescents in the form of compulsive buying. In contrast, their findings suggest that parents who encourage children to develop their own views about the world and make their own decisions (a concept-oriented communication style) may facilitate capital development and promote rational, optimal decision making that deters the development of impulse buying habits and lead to the development of compulsive behaviors [54,55]. Another study of Australian adolescents based on the LCP suggests that a socio-oriented family communication style that restrains youths from acquiring independence in decision making can impede capital development and lead to excessive consumption of material goods [52]. However, a similar life course study in France did not find a link between a socio-oriented communication style and the importance of consumption of material goods [75]. The authors attribute the latter finding to French cultural norms, which emphasize privacy regarding socio-economic matters that may affect the contents of parents' communication with their children.

Moreover, the effects of other agents of consumer socialization also need to be recognized in the Moore et al.'s model, especially the impact of peers and mass media sources during adolescent years [30]. Within the context of childhood obesity, peer experiences have been theoretically and empirically linked to unhealthy eating and suggested as main factors that contribute to the obesity epidemic [76]. However, Moore et al. downplay the effects of media influences on childhood obesity by emphasizing the mediating role of parents acting as gatekeepers of marketing messages that promote unhealthy eating habits [30,77]; and they exclude the impact of television programming (e.g., celebrities) on youth's self-image and eating habits [78].

Social media has an important role to play in the obesity crisis, but their effects have not been adequately investigated. For example, social networks can provide social support to obese individuals, which in turn, can help reduce stress associated with obesity and social stigma associated with it [79]. Based on a review of studies related to web-based weight management programs, An et al. [80] concluded that if such efforts are directed toward participants and their families, they can have positive effects in terms of weight control, BMI change, and activity level. Their research suggests that the many support groups, which are presently operating and thriving on social media, could enhance the well-being of obese persons not only by helping them develop self-respect and a positive body image, but also a healthy lifestyle.

It is possible to recast several elements of the consumer socialization model developed by Moore et al. [31] into the life course framework to represent elements and assumptions of the LCP (Figure 1). The conceptual framework of the LCP suggests that during a particular period ( $T_1$ – $T_2$ ) all children are “at risk” of becoming obese. The period between  $T_1$  and  $T_2$  can be considered as childhood years described in the Moore et al.’s model. Further, the factors that affect the likelihood of the onset of obesity among children can be in the form of events experienced during childhood years, such as “family instability” and various consumption episodes referred to by Moore et al. [31]. Such events that are experienced at  $T_1$  can directly or indirectly, via the three life course adaptation mechanisms, increase the likelihood of changes in food consumption habits that lead to the onset of obesity. The other characteristics mentioned in the Moore et al.’s model can be viewed as contextual variables, including age at which various episodes are experienced (viewed as timing) and social class (viewed as a social structural variable).

### 3.3.2. Directions for Future Research

Moore et al.’s model of childhood obesity can be improved in several ways by incorporating elements and assumptions of the LCP. First, it could help contextualize the effects of timing and time (duration). Although Moore et al. recognize the importance of time, the effects of time are mentioned in the context of changes in the young person’s socialization experiences throughout childhood and adolescent years attributable to changes in family structures with the passage of time. By incorporating timing (age at which children are first exposed to certain socialization practices) and duration (length of child’s experiences of various rearing styles in units of time), researchers could gain insights into the impact of specific socialization experiences on the formation of children’s food consumption habits.

Second, the LCP incorporates additional adaptation mechanisms beyond family processes that link the child’s experiences of changing life conditions to eating habits that lead to obesity. For example, stressful life experiences related to family transitions can also affect food consumption habits, considering the fact that eating tasty (but not necessarily healthy) food products is a form of coping with stress [49]. Furthermore, changes in parenting styles (e.g., being more controlling and authoritarian) as a consequence of changing family structures, have negative consequences on the child’s emotional security and self-esteem [48], which predict excessive food consumption habits [23]. An authoritarian and controlling parenting style may impair the development of human capital, leading to inhibition of impulsive tendencies [53,54] and orientations toward hedonically gratifying behaviors [53,61].

Third, in Moore et al.’s model, child-related influences such as heredity/genetic and physiological predispositions take the form of contextual variables in the life course conceptual model as agency-related factors (e.g., historical, individual characteristics—Ps), while family environment variables (e.g., family structure, parents’ weight) in the former model are equivalent to structural variables (Ss) described in the life course model (Figure 1). As culture is asserted to play a role [31], culture- and country-related factors (e.g., values, ethnic background) can be added as contextual variables to the aforementioned model. In a similar vein, correlates of obesity that have been uncovered in previous studies reviewed earlier [39,40,42–44,65–69] can be cast and studied as contextual variables within the life course conceptual model (Figure 1).

While previous studies do not offer insights into the mechanisms that link these variables (e.g., income, culture) to obesity, the life course suggests their direct and indirect role. For example, the effects of culture on obesity may not only be the direct result on unhealthy eating or preferences for larger food portions common in certain cultures [40,78]. Obesity may also reflect a social weight norm in certain cultures [70]. As research shows, the degree of conformity to this norm could explain the obesity epidemic [73], suggesting the indirect cultural effects via the adaptation mechanism of socialization (Figure 1).

The number of products and mass media messages targeting adult consumers related to weight and weight control is a strong indicator of the consumers’ needs and concerns about consumption of

foods and caloric intake that prevent or lead to obesity. These concerns are mirrored in recent statistics which show that obesity rates in the United States have reached epidemic levels in recent decades [81]. The increase in obesity rates likely are due to changes in lifestyles and food consumption habits rather than changes in heredity or family socialization environments. They suggest an urgent need to understand the factors that lead to body weight increase and obesity during adulthood years. In the same vein, there is a need to understand factors that can deter obesity. These factors can be incorporated and studied within the life course paradigm, which is viewed as a viable conceptual framework for the study of the onset of obesity [12]. The life course approach to the study of obesity assumes that all consumers are “at risk” of becoming obese, not just during childhood years, but at any stage in life, focusing on changing life circumstances (viewed as events) that trigger changes in the person’s eating habits and adaptation mechanisms that promote changes in eating habits, posing interesting theoretical and empirical questions for investigation.

A method for the study of obesity recently suggested by life course researchers is the so-called “health portfolio approach,” which entails the investigation of obesity within the context of a person’s overall health [12]. Based on evidence that health is multifaceted, this approach involves the study of obesity and the person’s body weight in general as a trajectory that is a dimension of the person’s entire health trajectory, which consists of other health-related trajectories (e.g., disease states, chronic conditions), and changes over the course of one’s life. This approach is based on the work of Hayward and Sheehan [37] that Shanahan et al. [12], cast within the context of premises that underscore the tenets of the LCP by stating that:

Trajectories of health must be described and explained in terms of origins, change, and the initiation and rate of change. At different points in the trajectory, different experiences may become more or less salient, and the balance of childhood and adult influences may change. [12] (p. 15)

By placing relevant variables within the life course paradigm, researchers can begin to explicate the factors that have contributed to the increase in obesity rates. For example, it has been suggested that the effects of life events and transitions on obesity might be indirect via the adaptation mechanism of stress and coping that promote changes in eating habits [49], with activation theories (e.g., sensation-seeking) and avoidance theories (e.g., escape) offered as explanations for changes in eating habits and the onset of obesity. Overconsumption of food occurs in response to stress because, according to escape theory, certain food and alcohol products can help decrease self-awareness of the consequences of stressful events [82]. Based on this theory, experience of stressful events over long periods of time can lead to overconsumption of such products that increases body weight and leads to obesity. The study of a person’s body weight and obesity as a trajectory intertwined with their food consumption habits rooted in the timing and duration of stressful life events could provide insights into a person’s overall health trajectory; it could enhance obesity models, such as Moore et al.’s [31] socialization model that falls short of specifying the effects of stressful episodes on the person’s eating habits during formative years and throughout a person’s life. Such an analysis would require the employment of hazard models, such as event history analysis (EHA), which are appropriate for analyzing changes in body weight and the onset of obesity as events that can be directly linked to changes in the person’s food consumption habits (as coping responses to stress) and indirectly to the timing and duration of stressful events. Thus, the gradual increase in body weight and the onset or risk of obesity (event at  $T_2$  in Figure 1) could be in part be explained by the life course adaptation perspective of stress and coping at any given period of time of the person’s life span ( $T_1$ – $T_2$ ). (For a discussion of hazard models suitable for life course research, see for example, Moschis 2019) [10].

Lastly, the LCP suggests that transitions from one state into the next cannot be simply thought of as changes, but as processes. As Elder asserts, “life transitions can be thought of as a succession of mini-transitions or choice points” (emphasis his) [9] (p. 958). Therefore, the onset of obesity should not be studied as an abrupt event, but as a transition, and a person’s food consumption trajectory can be studied as a process that entails stability and changes in healthy or unhealthy eating habits. Thus,

duration in an over-consumption state increases the risk of transition from a normal to an “over-weight” state (event at  $T_1$ ), duration in an over-weight state increases the risk of transition to the “obese” state (event at  $T_2$ ), and duration in the obese state increases the risk of transition to the “diabetic” state (event at  $T_3$ ), which increases the risk of the onset of additional chronic conditions (at  $T_n$ ) that have adverse effects on the person’s health trajectory and well-being over the course of his or her life. The influence of contextual factors may vary during this process, and different adaptation mechanism may operate at each state.

#### 4. Summary and Implications

The demand for food and non-food agricultural products continues to grow globally, as the Earth’s population increases coupled with rising incomes and increasing urbanization, prompting concerns about the sustainability of diets and the natural environment. It is necessary that people change their food consumption habits to ensure the sustainability of the Earth’s natural resources and the well-being of present and future generations, as these trends have been contributing to the obesity epidemic. Although government intervention via taxation on unhealthy products that lead to increases in obesity—the so-called “top-down” approach—has implications for sustainability [83,84], in this article we have argued for the “bottom-up” approach to accomplishing desirable goals [85] by treating government regulations as contextual (structural) factors within which consumers are embedded and act during specific time frames ( $T_1$ – $T_2$  in Figure 1). We contend that individuals in various roles and capacities are to a great extent responsible for the behaviors that affect their present and future well-being as well as the well-being of future generations. To facilitate research that helps understand the factors that lead to the onset and changes in food consumption habits, we have presented the LCP as a viable research framework. We have used two examples related to over-consumption—binge eating (as a compulsive behavior) and obesity (as outcome of over-consumption and unhealthy eating habits)—to illustrate the value of the model for studying the onset and change of these food consumption habits. We have presented previous models used to study the various forms of maladaptive consumption activities and showed how these models could be improved or incorporated into the broader multi-theoretical LCP, which is increasingly used internationally and across a large number of disciplines of behavioral and social sciences. The material presented herein should sensitize the reader about the limitations inherent in the life course paradigm as well as the opportunities for future research. For example, the LCP recognizes the dynamic interplay between agency and context, which is not easy to study because these factors are reciprocally influenced and change over time. For example, government intervention via taxation on unhealthy products may be the consequence of individual actions and, in turn, government intervention may affect individual behavior—hence the reciprocal link between structural context and individual choices (Figure 1). Thus, although the LCP accommodates such links, the study of reciprocal influences requires longitudinal data [86] as well as sound theories and rigorous methodologies, e.g., [87].

This article could not address every aspect of a person’s eating habits that have implications for sustainable food consumption and well-being (e.g., quantity, consumption of healthy, and organic foods); and it could not address other forms of excessive consumption that have adverse effects on other dimensions for sustainability. However, this article has offered a research framework for studying economic and environmental sustainability, both within and across countries, of not only excessive food buying and consumption, but also other forms of excessive consumption that tax the planet’s resources. For example, Baker et al. [35] and Baker and Chan [51] illustrate how countries can be used as contextual variables within the LCP to investigate cross-country similarities and differences in developmental linkages that explain other forms of excessive consumption (compulsive buying and acquisition of material goods) that have adverse effects on environmental sustainability.

Finally, the scope of the present research could be expanded beyond economic sustainability to help researchers study social and environmental sustainability. For example, excessive use or waste of food products could be studied within the general life course model as a behavioral variable (at  $T_2$  in



Figure 1), and so could other variables related to social and environmental sustainability. Prakitsuwan and Moschis [88] show how the LCP could be used to study social sustainability of different generations by means of enhancing the various domains of older people's well-being (e.g., physical, financial) that would help the financial and emotional well-being of their younger care-givers and descendants. In a similar vein, Yingwattanakul and Moschis [89] demonstrate how LCP tenets and methods suitable for life course research [13] could be used to study the onset and continuity of preventive healthcare behaviors that promote physical well-being in later life. Using a similar approach, researchers could examine the onset and continuity of behaviors that promote environmental sustainability (e.g., recycling, using public transportation or carpooling, buying organic products). Life course analytic methods (e.g., EHA) allow researchers to study both abrupt and gradual changes in such behaviors [13]. In sum, although this article falls short of demonstrating the application of the LCP to every specific area within the broader dimensions of sustainability, it is hoped that it has provided the impetus and a useful blueprint for future research in this field.

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