



An Evolutionary Framework on Maladaptive Consumption Behaviours*

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Received April 10, 2018; Accepted June 27, 2018

Abstract: Obesity is caused by the interaction between genetic and cultural or behavioural predispositions. Thus, both genes and culture are products of evolutionary processes, hence cultural selection acts on eating behaviours and perceptions. Nowadays, more and more scientific studies are being conducted on obesogenic phenomena owing to health concerns arising in western countries and eastern European countries, which, in recent decades, have experienced a cultural shift in food consumption and perceptions about what it is considered healthy. Heredity, changes in diet, leisure-time behaviours, and the quality of physical activity are the main factors involved in overweight and obesity. Additionally, other factors involved in obesogenic phenomena are related to family, economic factors, lifestyle, preferred foods, and nutritional beliefs regarding food consumption. Considerable cross-cultural variation exists – even among different ethnicities living in the same geographical area – and cultural selection is the principal cause. One previous study conducted on Albanian citizens aged 2 to 20 years revealed the numbers of overweight and obese Albanian children and adolescents to be among the highest in Europe. Overweight and obesity are caused by food habits and cultural perceptions regarding health. While genetics plays a significant role, it is mostly major cultural changes in post-communist countries that are responsible for obesogenic phenomena. Consumption behaviours regarding food and health in Albania are the principal factors involved in the spread of obesogenic phenomena across the post-communist states.

Keywords: *evolution, consumption behaviours, transmitted culture, obesity, Balkan area, Albanians*

Introduction

The prevalence of overweight and obesity in both adults and children has reached epidemic proportions worldwide and poses what is arguably one of the most significant threats to population health that is currently faced. In 2014, more than 1.9 billion adults aged 18 years and older were classified as overweight, and of these, 600 million were classified as obese (WHO Fact Sheet, 2015). Overweight is defined as having excess body weight for a particular height from fat, muscle, bone, water, or a combination of these factors (National Institutes of Health, 2010). Obesity is defined as having excess body fat (Krebs *et al.*, 2007). The reasons for the differences in the prevalence of obesity among groups are complex, likely involving genetics, physiology, socioeconomic status, environment and interactions among these variables, as well as others that have not yet been fully recognized (Caprio *et al.*, 2008). Less attention has been paid to investigating the potential contribution of socio-cultural factors, and changes in the socio-cultural environment over time, to the current obesity pandemic. Social causes of obesity are rated as less important compared with overeating and nutritional causes (Phelan *et al.*, 2015). Obesity is affecting many low- and middle-income countries, particularly in urban settings. For example, the body mass index (or BMI, an indicator of excess body fat) was higher every year between 1986 and 2002 among adults in the USA in the lowest income group and the lowest education group than among those in the highest income and education groups (Truong & Sturm, 2005). Later on, wages were found to be inversely related to BMI and obesity in a nationally representative sample of more than 6,000 adults – meaning those with low wages had increased BMIs as well as an increased chance of being obese (Kim & Leigh, 2010). Later still, childhood obesity was found to be one of the most serious public health concerns. In 2013, 42 million children were overweight and obese, 31 million of whom were living in developing countries (WHO, 2013). As mentioned, obesity is a major problem,

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#This paper has been presented in ISESER-2018, Konya, Turkey

especially in the USA. In 2009–2010, approximately 12.5 million US children and adolescents aged 2–19 years were classified as obese (Ogden *et al.*, 2012). OECD countries have a high rate, and the statistics reveal that individuals are increasingly at risk of being overweight and obesity. However, according to the OECD Fact Sheet (2014), the rate of obesity and overweight has been virtually stable – or only risen modestly – in Canada, England, Korea, Spain and the United States, but has increased in Australia, France, Mexico and Switzerland. Obesity is a social phenomenon, for which appropriate action includes targeting both economic and socio-cultural factors (McLaren, 2007).

Risk factors for overweight and obesity

As mentioned, people with lower socio-economic status and less education are more likely to be obese, and the data obtained indicate that this feature is also present in developing countries, especially in the Balkan region. Furthermore, a pattern of obesity in developing countries has been linked to increased consumption of western-style diets high in sugar, fat and salt. This cultural shift in the Balkans, especially in Albania, is due to historical isolation during the communist era. The lack of western brand name foods and the cultural perceptions associated with what is considered healthy initiated new cultural norms regarding food and what is to be considered as healthy. A nationwide survey conducted in Albania in 2013 by Hyska *et al.*, comprising a representative sample of 5,810 schoolchildren aged 7.0–9.9 years, indicated that 9.8% of the boys were obese versus 5.5% of the girls. The prevalence of both overweight and obesity was remarkably higher among urban children than among their rural counterparts (Hyska *et al.*, 2014). In this context, urban children are more familiar with brand foods and develop poor dietary habits compared with their rural counterparts, who tend to value traditional food more.

Another study by Karayiannis *et al.* (2003) provided national estimates for overweight and obesity in Greek school-aged children and adolescents. The study samples consisted of 4,299 students: 51.3% girls and 48.7% boys. According to their BMI, 9.1% of all girls and 21.7% of all boys in the study were classified as overweight, whereas the corresponding values for obese girls and boys were 1.2% and 2.5% respectively. The prevalence of combined overweight and obesity was higher in urban areas than in semiurban/rural areas, and higher in private schools than in the public schools. As a result of the same cultural background, the Greek minorities living in south Albania have high numbers of overweight and obese individuals. In a sample of 100 Greek children living in south Albania aged 4, 10 and 17 years, 96%, 65% and 70% were estimated as overweight and/or obese, respectively, for both sexes (Agolli, 2013). According to the same study, in a sample of 100 Albanian children aged 4, 10 and 17 years, 83%, 51% and 39% were estimated as overweight and/or obese, respectively. Within low-income countries, obesity is more prevalent among the higher-SES groups (i.e. those with a higher level of income or education) than among the lower-SES groups (Dinsa *et al.*, 2012).

In Romania, 3,626 children aged 7–18 years were classified by their body mass index according to the criteria of the International Obesity Task Force (IOTF), and the overall prevalences of overweight and obesity were found to be 18.2% and 7.2% respectively (Emandi *et al.*, 2013). According to this study, the prevalence of both overweight and obesity was higher in boys than in girls, and higher in rural versus urban subjects. Overweight and obesity were correlated with the consumption of sweetened beverages and sweets and also with sedentary behaviour.

While the consumption of sweetened beverages and sweets, coupled with sedentary behaviour, in developing countries are the main cause of overweight and obesity, other factors are also involved. For example, in Sweden the prevalence of overweight was found to be 15.6%, of which 2.6% were obese, in a sample of 3,636 Swedish children aged 7–9 years. Level of urbanization along with parental characteristics (weight status and education) have been related to risk of overweight (Moraesus *et al.*, 2012). This supports earlier reports identifying areas of low socioeconomic status as high-risk areas for overweight and obesity (Sjoberg *et al.*, 2011). Low socioeconomic status is not the only factor relevant to obesogenic phenomena. A study by the Human Sciences Research Council found that 88% of South Africans regard a fat body as their ideal. Human fat stores not only buffer malnutrition, but also regulate reproduction and immune function, and are subject to sexual selection (Wells, 2006). In this population, fat is correlated with good health and attractiveness in human populations that constantly faced survival problems or food scarcities in their past. Thus, cultural attitudes towards special types of body shapes must also be considered (Bodzsar & Zsakai, 2014).

Hypotheses regarding overweight and obesity

The prevalence of obesity in modern societies has two major contributory factors: an environmental change that has occurred historically and a genetic predisposition that has its origins in our evolutionary history (Speakman, 2013). Several hypotheses have attempted to explain the high rate of obesity present in today's world. In 1962, the geneticist James Neel proposed the "thrifty genotype" hypothesis (TGH), which suggested that obesity today is a throwback to our ancestors having undergone positive selection for genes that favoured energy storage as a consequence of the cyclical episodes of famine and surplus after the advent of farming 10,000 years ago. Since famine never arises out of an abundance of food, there is a mismatch between the environment in which the brain evolved and the environment of today. This mismatch results in the high prevalence of obesity rates worldwide and health problems such as diabetes.

The "drifty genotype" hypothesis contends that the prevalence of thrifty genes is not a result of positive selection for energy-storage genes but, rather, is attributable to genetic drift resulting from the removal of predatory selection pressures (Speakman, 2008). This hypothesis has been challenged, and genetic drift is not viewed as a main factor in causing obesity. A combination of famines and seasonal food shortages in the post-agricultural era has exerted natural selection in favour of fat storage (Prentice *et al.*, 2008).

Another hypothesis contends that the modern obesity pandemic in industrialized countries is a result of the differential exposure of the ancestors of modern humans to environmental factors that began when modern humans left Africa around 70,000 years ago and migrated throughout the globe, reaching the Americas around 20,000 years ago (Sellayah *et al.*, 2014).

The last hypothesis considers the context of historic human population redistribution and ethnic differences in genetic susceptibility to obesity and the metabolic syndrome. All three mentioned hypotheses focus on environmental changes over time, positive selection and genetic drift, and human population redistribution.

Furthermore, the behavioural switch hypothesis explains the modern pandemic of metabolic diseases as caused by extreme environmental stimuli: population density, urbanization, social competition, access to high-calorie foods, and sedentary lifestyles exaggerated to an extent never before witnessed in human history (Watve & Yajnik, 2007). This hypothesis argues that metabolic diseases are by-products of a socio-ecological adaptation that allows humans to switch between both reproductive and socio-behavioural strategies, and maintains that physiological responses that were adaptive in the past have become maladaptive in modern environments (Genné-Bacon, 2014).

Environmental conditions trigger social groups to respond in different ways which are manifested in their behaviours. For example, the evolutionist Elizabeth Cashdan (1989) found that some San groups are more egalitarian than others and that these cultural differences are closely linked with the variance in food supply (Buss, 2008). Food sharing is conditioned by food abundance in a certain environment. When food variance is low, a social group tends not to share it outside their extended family. Cultural differences regarding consumption behaviours can be attributed to the evoked culture and transmitted culture. The concept of evoked culture, first proposed by Cosmides & Tooby in 1992, refers to phenomena that are triggered in some groups more than in others because of differing environmental conditions. An example of evoked culture is the variance in food supply analyzed by the evolutionist Elizabeth Cashdan.

Transmitted culture refers to representations or ideas that originally existed in at least one mind and are transferred to other minds through observations or interaction (Cosmides & Tooby, 1992). Because "information" emanating from other individuals in one's social groups is limitless, some ideas compete better than others. In this context, information regarding food – and perceptions about what is considered healthy – vary within a certain group; only those perceptions that would affect survival and reproduction in ancestral environments would be socially transmitted among other generations. Much of an individual's behaviour is a product of beliefs, skills, ethical norms and social attitudes that are required from others with little, if any, modifications (Richerson & Boyd, 2005). Historically in Albania, because of harsh environments and poor quality of health, those ideas or beliefs that emphasize the absence of weakness, diseases or malfunctions are expressed in a preference for fatness. But the post-communist period anticipated the spread of different brand foods and made possible an array of choice regarding food consumption. These cultural shifts along a common belief – that being healthy means being fat – persisted and are expressed in the high rates of overweight and obesity in the Albanian population. In this newly obesogenic environment, cultural selection will favour the common beliefs presented in a

population not because they are adaptive today but because they mirror the historical and environmental conditions for which these beliefs were culturally selected in the first place. Body proportions are perceived to reflect personality traits, and this raises the possibility that in addition to energy storage, social selection may have played some role in shaping the biology of obesity (Mankar *et al.*, 2008).

Conclusions

The obesity epidemic – largely manifest in industrialized societies but now spreading to the rest of the world – is the result of interaction between human biology and human culture over the long period of human evolution (Beltisari, 2008). Cultural transition affecting a certain population after a long cultural isolation offers many different choices regarding food, so new consumption behaviours are formed. With harsh environments and poor quality of health, those ideas that emphasize the absence of weakness, diseases or malfunctions will be expressed in a preference for fatness. Cultural selection will favour those ideas or cultural norms regarding food not because they are adaptive in nature but because they represent the historical and environmental conditions in which those norms were selected. In this context, cultural selection is responsible for creating new cultural norms regarding food from pre-existing norms. These newly created norms can be maladaptive because they are selected in a different cultural environment where information or consumption behaviours vary greatly.

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