Childhood Socioeconomic Status and Adult Food Preference

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Contributor: Jim B. Swaffield , Qi Guo

Early childhood socioeconomic status (SES) conditions can influence how an adult responds to stress, their food preferences, the volume of food consumed, the likelihood that one will desire to eat in the absence of an energy deficit, the development of eating disorders, and the likelihood that one will suffer from adult obesity.

stress eating food obesity appetite trait appetite socioeconomic status

1. Introduction

Excessive body weight and obesity are associated with a number of medical conditions such as metabolic disorders, heart disease, diabetes, cancer, stroke, and orthopedic problems [1]. In addition, carrying excessive body weight lowers life expectancy [2] and creates an economic burden as it increases the costs of delivering public healthcare services [3].

The etiology of obesity is complex as it is an outcome of an interaction between multiple genetic and environmental factors [4][5]. To gain a deeper understanding of the obesity epidemic, it is need to understand not only what environmental factors are correlated with obesity, but also how environmental factors interact with each other, and how environmental factors interact with genetic factors. For example, it is well-established that early childhood socioeconomic status (SES) [6][7] and stress [8] are strongly correlated with obesity. However, what is less well-understood is how these factors interact and lead to specific food preferences and the volume of food desired.

With regards to obesity and psychosocial factors, there is a gap in the extant literature in terms of identifying what variables mediate the relationship between low childhood socioeconomic conditions, food preference, and the desire to eat. Understanding these interactions may help to develop strategies that promote healthier food consumption behaviour and reduce health problems associated with having excess body weight.

1.1. The Effects of Socioeconomic Status on Eating

Research has shown that harsh SES conditions experienced during childhood can adversely affect an individual's physical and psychological development and create patterns of behaviour that are carried into adulthood. More specifically, early childhood SES conditions can influence how an adult responds to stress, their food preferences, the volume of food consumed [9][10][11], the likelihood that one will desire to eat in the absence of an energy deficit [12], the development of eating disorders [13], and the likelihood that one will suffer from adult obesity [6][7].

Studies have also shown that stress influences food preference and the volume of food consumed. Stress can both increase and decrease appetite depending on the type and intensity of the stressor [6][14]. Low-intensity chronic stress tends to increase appetite whereas acute stress tends to decrease appetite [15][16]. Mild stress tends to increase the desire to consume high-energy-dense food [16][17][18][19] and decrease the desire for low-energy-dense foods [20].

Socioeconomic status and stress both affect appetite and food choices. Studies that have looked at the association between SES and stress have produced mixed and sometimes contradictory results. For example, Macleod, Smith, Metcalfe, and Hart [21] concluded there is a robust correlation between income, education, functional health, and SES; however, they did not find a relationship between reported stress levels and SES. In contrast, research by Matthews, Gallo, and Taylor [22] and Macleod et al. [21] have found a strong association between low SES, stress, and poor health.

These inconsistent findings may be a result of two factors. First, research has shown that it is not simply having low SES that creates stress, but rather the subjective feeling of being inferior to others who are perceived to possess higher SES [23]. Sapolsky [24] adds a low SES environment does not necessarily lead to elevated stress. Rather, low SES generates elevated levels of stress when in the presence of others who have higher SES. Therefore, to understand the relationship between SES and stress, it must be evaluated relative to and in the presence of others who have the same or different levels of SES.

A second factor that may contribute to these inconsistent findings may be due to the use of different methods used to measure SES and stress [25]. Both SES and stress can be assessed through subjective and objective measures. Subjective measures of socioeconomic status may include opinion surveys that ask participants to rate how much money they or their family has relative to others, whereas objective measures may include assessing adult or parent education levels, occupation, or income. Some studies focus on specific domains of stress such as financial, physical safety, health, or relationship stressors. These dimensions are sometimes measured through subjective measures such as opinion surveys that ask how stressful one's life is, or through objective measures such as assessing biological markers of cortisol through saliva or hair assays [26].

As previously noted, there are many different sources of stress. Nettle, Andrews, and Bateson [27] postulate that the primary type of stress that motivates excessive food consumption is insecurity due to competition for scarce resources such as food. This theory claims that SES and food insecurity are associated. What creates high insecurity and stress in low SES environments is not the environmental conditions per se, but rather an individual's low relative standing within the SES hierarchy. Thus, the stressors experienced are often due to the competitive presence of others. Individuals who are of higher status receive preferential treatment and greater access to scarce resources that are needed for survival; those lower down the SES hierarchy would have a chronic sense of insecurity about their current and future ability to acquire scarce resources needed for survival, and therefore have higher chronic stress. What is important to note is that it is not the actual number of resources that are available, but rather the presence of others with higher SES that triggers stress and excessive feeding behaviour.

2. The Relationship between Past Childhood SES and the Desire for Low-Energy-Dense Foods

The first pathway (**Table 1**, path 1a) examined the indirect effect of past (childhood) SES on low-energy-dense food desirability mediated by current adult SES and current stress level.

Table 1. The indirect effect of past (childhood) SES on low-energy-dense food desirability.

								Bootstrap CI
1a.	Past SES	→	Current SES	→	Current Stress Level	→	Desire for LEDF	0.005, 0.034

LEDF = low energy dense foods.

In path 1a, there is a positive association between childhood SES level and adult desire for low-energy-dense foods. Adult participants who lived in a high SES environment during childhood were more likely to desire low-energy-dense foods than those who lived in a low SES environment during childhood.

Specifically, past (childhood) SES positively and significantly predicted current (adult) SES (0.312 *). Current adult SES then negatively and significantly predicted current stress level (−0.344 *), which negatively and significantly predicted preference for low-energy-dense food (−0.151). Thus, there was an overall positive indirect effect from past SES on the preference for low-energy-dense food. The indirect effect was tested using a bias-corrected bootstrap confidence interval, and the result was significant (95% CI = 0.005, 0.034).

3. The Relationship between Past Childhood SES and the Desire for High-Energy-Dense Food

The second analysis examined the indirect effect of past (childhood) SES on the adult desire for high-energy-dense food. This analysis shows there are two paths.

First, path 2a (**Table 2**) shows that when the mediating effect of trait appetite (desire for food in the absence of an energy deficit) is factored out from the analysis, adult participants who had high childhood SES were more likely to have a high preference for high-energy-dense food.

Table 2. The indirect effect of past (childhood) SES on the adult desire for high-energy-dense food.

										Bootstrap CI
2a.	Past SES	→	Current SES	→	Current Stress Level		→	Desire for HEDF		0.002, 0.027
2b.	Past SES	→	Current SES	→	Current Stress Level	→	Trait Appetite	→	Desire for HEDF	− 0.014, − 0.003

Specifically, in path 2a, past childhood SES positively and significantly predicted the desire for high-energy-dense food whereas the second path (**Table 2**, path 2b), shows an opposite effect whereby past (childhood) SES had a significant negative effect on the desire for high-energy-dense food, meaning when trait appetite is factored into the analysis, if an adult study participant had high childhood SES, they were more likely to have low trait appetite and a low desire for high-energy-dense food. In contrast, if an adult participant had low childhood SES, they were more likely to have a high trait appetite and a high desire for high-energy-dense food.

The specific details are as follows. In path 2a, past (childhood) SES positively and significantly predicted current (adult) SES (0.312). Current adult SES then negatively and significantly predicted current stress level (−0.344), which negatively and significantly predicted the desire for high-energy-dense food (−0.102). Thus, there was an overall positive indirect effect from past SES to preference for high-energy-dense food. The indirect effect was tested using a bias-corrected bootstrap confidence interval, and the result was significant (95% CI = 0.002, 0.027). Thus, if a participant had high childhood SES, adult participants were more likely to have a high preference for high-energy-dense food.

The second pathway (2b) included trait appetite as a mediating variable. The overall indirect effect of past (childhood) SES on the desire for high-energy-dense food when mediated by adult SES, stress level, and trait appetite was negative. The indirect effect was tested using a bias-corrected bootstrap confidence interval, and the result was significant (95% CI = −0.014, −0.003).

In sum, after combining the positive and negative effects, stress has an overall significant positive effect on the desire for high-energy-dense food, with a value of 0.081 (bootstrap CI: 0.034, 0.129). However, stress does not have a significant effect on the desire for low-energy-dense food, with a value of 0.028 (bootstrap CI: −0.10, 0.066).

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