Social class and body weight among Chinese urban adults: The role of the middle classes in the nutrition transition

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ABSTRACT

While a plethoric empirical literature addresses the relationship between socio-economic status and body weight, little is known about the influence of social class on nutritional outcomes, particularly in developing countries. The purpose of this article is to contribute to the analysis of the social determinants of adult body weight in urban China by taking into account the influence of social class. More specifically, we propose to analyse the position of the Chinese urban middle class in terms of being overweight or obese. The empirical investigations conducted as part of this research are based on a sample of 1320 households and 2841 adults from the China Health and Nutrition Survey for 2009. For the first step, we combine an economic approach and a sociological approach to identify social classes at household level. First, households with an annual per capita income between 10,000 Yuan and the 95th income percentile are considered as members of the middle class. Second, we strengthen the characterization of the middle class using information on education and employment. By applying clustering methods, we identify four groups: the *elderly and inactive middle class*, the *old middle class*, the *lower middle class* and the *new middle class*. For the second step, we implement an econometric analysis to assess the influence of social class on adult body mass index and on the probability of being overweight or obese. We use multinomial treatment regressions to deal with the endogeneity of the social class variable. Our results show that among the four subgroups of the urban middle class, the new middle class is the only one to be relatively well-protected against obesity. We suggest that this group plays a special role in adopting healthier food consumption habits and seems to be at a more advanced stage of the nutrition transition.

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1. Introduction

The concept of nutrition transition is often invoked to explain the increase in nutrition-related health problems in the developing world. The nutrition transition describes the near-universal changes in dietary patterns, nutrient intakes and physical activity when populations adopt modern lifestyles during economic development and urbanization (Popkin, 2003). China is a relevant example illustrating these shifts in the developing world. The country is undergoing a rapid nutrition transition, and has gone through several stages over roughly half a century (Du et al., 2002). Such rapid changes have been fostered by the improvement in food supply and the increasing diversity of food products (Popkin et al., 2001). Concomitantly, a consumer revolution has emerged, resulting in striking changes in food consumption. According to Popkin (2003), the shift in the Chinese diet follows a classic westernisation pattern, as exemplified by the proliferation of fast food outlets. The traditional Chinese diet, with its high carbohydrate content composed of rice, wheat and cooked vegetables, is being replaced by diets higher in fat. The increase in dietary energy and dietary fat, associated with a decrease in physical activity, are partially responsible for the rise in the number of overweight and obese Chinese people since the late 1980s (Du et al., 2004; Zhang et al., 2008). Even if the prevalence of overweight and obese individuals in China is relatively moderate compared to other developing countries (below 30% according to Zhang et al., 2008), the increasing trend is alarming. Not surprisingly, the prevalence of such health problems is higher in urban areas, although the rise is particularly pronounced in rural areas (Wu et al., 2009). In fact, the rapid modernization and westernization of urban areas expose Chinese people to an increasingly "obesogenic environment", characterised by the "abundance of stimuli to encourage consumers to eat and to consume more on the one hand, and to exercise less on the other" (Zhang et al., 2008: 41).

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Analysing the shifts in dietary patterns associated with the nutrition transition is of particular interest in order to understand the rise in obesity in developing countries and eventually tackle this health issue. Indeed, diet and physical activity, as well as food preferences, constitute risk factors identified as proximal causes of disease by most epidemiological studies. However, the seminal work of Link and Phelan (1995) suggested that social factors, such as socio-economic status (SES), should be considered as "fundamental causes of disease". In this regard, China is an interesting case insofar as its socio-economic structure was largely shaped after the beginning of economic reforms in the early 1980s. The sustained economic development over the past three decades has been followed by a spectacular increase in mean per capita income, which has recently promoted the expansion of the Chinese urban middle class (Bonnefond and Clément, 2012). The Chinese middle class is considered to be at the vanguard of consumption and is often seen as a catalyst class that drives changes in attitudes, behaviours and values (Elfick, 2011). As a consequence, the middle class may have played an important role in the adoption of modern food consumption patterns and may have a particular relationship with body weight compared to the rich or the poor. However, the Chinese middle class is heterogeneous and consists of a complex mosaic of groups and individuals that differ in terms of many social, economic and demographic characteristics (Bonnefond et al., 2013). We suggest that the different subgroups of the middle class do not necessarily have the same values regarding food consumption and body perception.

This article has two main purposes. First, we propose to strengthen the analysis of the social determinants of body weight by creating an indicator of social class which accounts for a wide range of socioeconomic variables. This indicator is expected to emphasize the heterogeneity of the Chinese middle class. Second, we perform an econometric analysis to identify the position of each social class in relation to being overweight or obese. To deal with the endogeneity of social class, we use multinomial treatment regressions. We have chosen to focus on Chinese urban adults insofar as the rise in numbers of overweight and obese people as well as the expansion of the middle class are more significant in Chinese cities than in rural areas. We use both individual and household-level data from the China Health and Nutrition Survey (CHNS). The paper is organized as follows: Section 1 establishes the potential links between SES/social class and obesity, and gives some pieces of evidence for China. Section 2 develops the conceptual framework and describes the data and the variables of interest. Section 3 focuses on the identification of social classes and analyses the heterogeneity of the Chinese urban middle class. Finally, results from the econometric analysis are presented and discussed in Section 4.

2. Social dimensions of obesity in China

A seminal review of empirical studies examining the relationship between SES and obesity was first published by Sobal and Stunkard (1989) for the period from the 1960s to the mid-1980s, and then updated by McLaren (2007) through to 2004. Two main findings can be drawn from these studies. First, in developed societies a consistent inverse relationship is observed between SES and obesity for women, although the association remains unclear for men and children. Second and conversely, a positive association between SES and obesity is largely confirmed in developing countries for women, men and children. Nevertheless, Monteiro et al. (2004) qualify the nature of the relationship between SES and obesity in developing countries. They note a shift in the burden of obesity towards the lower SES groups as a country's gross national product increases. Popkin and Gordon-Larsen also underline that

"belonging to the lower-SES group confers strong protection against obesity in low-income economies, can reduce or increase obesity in lower-middle income economies and is a systematic risk factor for obesity in upper-middle income developing countries" (2004: S6). All in all, these observations suggest that social standards regarding the perception of body weight may vary in accordance with the level of economic development of the country concerned. In developed countries, thinness is a widespread ideal, especially among women at the top of the socioeconomic spectrum (McLaren and Kuh, 2004). Conversely, excess weight is associated with high status in developing countries, where a large body size for men is considered as a sign of power and prowess (McLaren, 2007).

Several recent studies have examined the association between SES and adult obesity in China. Du et al. (2004) emphasize that being overweight and obese are positively associated with income insofar as their prevalence among high-income people is approximately twice that of low-income people. Zhang et al. (2008) confirm that Chinese urban residents with a higher income and a higher level of education are more likely to be overweight or obese. As mentioned by Wu et al., "in Chinese culture, there is still a widespread belief that excess body fat represents health and prosperity" (2009: 23). Nevertheless, Du et al. (2004) show that the features of the Chinese nutrition transition suggest a shift in the burden of obesity towards the poor. Recent findings also indicate that the relationship is not so clear and that significant gender disparities exist in the SES-obesity gradient. For instance, Jones-Smith et al. (2012) and Ma (2012) show that current SES (proxied by the level of education) is positively associated with being overweight or obese for men while the relationship is negative for women. In the same way, using data for Zhejiang province, Xiao et al. (2013) find a positive association with income for men, and a negative association with education for women. In a study on the elderly (aged 45 and over) in Gansu and Zhejiang provinces, Strauss et al. (2010) also report a positive correlation of male body weight with income and education, and an inverted-U relationship between education and female body weight. Finally, by bringing together data from nine Chinese provinces as regards their development level (low-middle-high), Tafreschi (2011) emphasizes that the shift in the income-body weight gradient occurs in the later stages of economic development. To sum up, the relationship between SES and obesity in China seems to be non-linear, and the transition from the "developing country pattern" towards the "developed country pattern" appears to be faster for women than for men. Changes in social norms regarding body weight can be a potential source of gender differences. Among Chinese males, a large body is still considered as a sign of prowess, prosperity and wealth (Xiao et al., 2013). However, Chinese women of higher SES have become more and more concerned about their physical appearance. As mentioned by Luo et al., "with the opening of Chinese media and marketing to Western influences, Chinese women have internalized slimness as an indicator of beauty, good health, self-discipline and sexual attractiveness" (2005: 344). Thinness has therefore become socially valued by Chinese women of higher SES, as in developed countries.

3. Conceptual framework and data

Body weight is explained by the energy balance in a given period which is the difference between calories consumed and calories expended (Chou et al., 2004). As a consequence, a behavioural model for body weight should include all the factors that affect that energy balance directly. Such proximate determinants may be diet, eating and cooking practices and physical activities as well as individual and genetic factors. If we consider the influence