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Weight perceptions, weight control and income: An analysis using British data

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ABSTRACT

The aim of this paper is to better understand one of the mechanisms underlying the income–obesity relationship so that effective policy interventions can be developed. Our approach involves analysing data on approximately 9000 overweight British adults from between 1997 and 2002. We estimate the effect of income on the probability that an overweight individual correctly recognises their overweight status and the effect of income on the probability that an overweight individual attempts to lose weight. The results suggest that high income individuals are more likely to recognise their unhealthy weight status, and conditional on this correct weight perception, more likely to attempt weight loss. For example, it is estimated that overweight high income males are 15 percentage-points more likely to recognise their overweight status than overweight low income males, and overweight high income males are 10 percentage-points more likely to be trying to lose weight. An implication of these results is that more public education on what constitutes overweight and the dangers associated with being overweight is needed, especially in low income neighbourhoods.

1. Introduction and background

Being overweight or obese is known to be bad for your health, yet the prevalence of obesity is increasing worldwide (Lobstein and Jackson Leach, 2007). Coined as the "most prevalent nutritional problem in the world" (Lau et al., 2007), the epidemic is most prevalent in developed countries. For example, in Canada, U.S., France and Australia, 23% (Linder et al., 2010), 33% (Dorsey et al., 2009), 17% (International Obesity Task Force, 2011) and 25% (International Obesity Task Force, 2011) of the population are classified as obese (BMI of 30 kilograms per squared metre or greater "for obese (inclusive of 30)), respectively. While obesity rates are similar for males and females, there is a divergence between genders with respect to being overweight. For example, in Canada 42.8% of males and 23.7% of females are overweight (body mass index (BMI) of 25 kilograms per squared metre or greater" (inclusive of 25)) or obese. The equivalent figures for the U.S., France and Australia are 40.1% and 28.6%, 41.0% and 23.8%, and 42.1% and 30.9%, respectively (International Obesity Task Force, 2011).

In England, over 40% of men and 30% of women are overweight or obese (International Obesity Task Force, 2011), with predictions that *without action*, 60% of men, 50% of women and 25% of children will be obese or obese by 2050 (Butland et al., 2007). Action is being taken, however, with £75 million of public health funds and £200 million of external funds earmarked for a public health campaign called 'Change4Life' in 2009 (The Lancet, 2009). This campaign was launched in response to the extra-ordinary economic costs associated with the overweight population – approximately £7 billion per year in England (National Institute of Health and Clinical Excellence, 2006). These estimates include medical costs; being overweight is

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associated with an increased risk of type 2 diabetes, heart disease, stroke, high blood pressure, certain cancers (colon, breast, endometrial and gallbladder), and high cholesterol. However, the campaign as yet has not produced any visible signals that it is defeating the obesity epidemic. Therefore, given that the obesity epidemic is not waning either in England or in other developed countries, there is scope to investigate further its underlying causes.

In this paper, we investigate the obesity-income gradient by estimating the impact of income on weight perception and weight control in a sample of overweight British adults. While those of high income may have a lower weight because they can afford a healthier lifestyle, it is also plausible that they have a more narrowly defined standard for acceptable body size and adjust their behaviour accordingly. This would suggest an income gradient with respect to weight perceptions and a subsequent role for weight perceptions in determining a person's propensity to pursue weight control. An independent income gradient–weight control relationship is also likely to exist owing to the higher opportunity costs associated with weight control for poorer people.

Our work is related to two main strands of the obesity literature. The first of these is the literature that attempts to estimate the impact of income on the propensity to be overweight or obese. So far, many studies have found that higher socioeconomic status is related to a lower risk of obesity (Costa-Font et al., 2008; Wamala et al., 1997; Zhang and Wang, 2007). However, the endogeneity of income in a weight regression complicates these studies interpretation. That is, income may cause a person to be overweight, being overweight may cause lower income or common factors may affect both income and overweight status. These factors include individual heterogeneity such as self-discipline and impulsivity (Cutler et al., 2003), along with weight misperceptions, which we explore in this work.

Attempts have been made to establish a causal relationship between BMI and income with mixed results. For example, Quintana-Domeque (2005) utilise the European Community Household Panel (ECHP), and exploit exogenous variation in household income owing to inheritance, gifts, or lottery winnings of €2000 or more to instrument for income in an obesity regression. They explore this relationship for nine countries and find a relationship between income and obesity only for women in both Denmark and Italy, and men in Finland. Notably, this work suffers from a weak instrument problem. In the U.S. context, Cawley et al. (2008) exploit exogenous variation in the social security policy but are unable to identify any statistically significant relationship between additional social security income and BMI in the elderly. Schmeiser (2009) examine the effect of family income changes on BMI and obesity using data from the National Longitudinal Survey of Youth 1979 cohort. They find that income significantly raises the BMI and probability of being obese for women only. Finally, using a longitudinal Swedish panel Ljungvall and Gerdtham (2010) estimate the impact of mean income, positive deviation from mean income and negative deviation from mean income on weight status using questionable instruments. They find income to be negatively related to obesity in general.

The second strand of literature that our work relates to concerns itself with the relationship between actual body size and body size perception. Self-perception of body size is a factor that can influence whether weight loss is a concern. Clearly, if a person is unaware they are overweight they cannot fully internalise the costs associated with the health risks of their weight status. This is in line with research suggesting accurately perceiving oneself as overweight or obese results in a greater motivation to engage in healthy lifestyle behaviours (Baranowski et al., 2003 and Rhee et al., 2005). Given that misperceptions of a normal weight among the overweight and obese have been highlighted in the general literature (Collins et al., 1987; Kuchler and Variyam, 2003; Maximova et al., 2008; Paeratakul et al., 2002; Viner et al., 2006) as well as in the literature specific to the UK (Wardle, 2002; Johnson et al., 2008) the problem of a failure to internalise is one that may contribute to the obesity epidemic. This work aims to explore the role of an income gradient on weight perceptions. Specifically we focus on individuals who are the targets of obesity campaigns in England. That is, we focus on the overweight and obese.

The potential for income to be associated with weight perceptions is linked to it being usual for poor individuals to have poor friends (Tigges et al., 1998; Wacquant and Wilson, 1989) and the likelihood that poorer people are more likely to be overweight or obese. Therefore, peer effects may imply an increased propensity for poorer people to perceive being overweight as a 'healthy' weight, which may reflect ideals of body weight among that group (Kemper et al., 1994). This arises because people's behaviour is likely to be influenced by the norms in their social environment. Thus, when overweight becomes the norm within a peer group, it is likely that the negative social stigma associated with being overweight is reduced. The idea that your social circle can affect your weight is supported by recent research. Christakis and Fowler (2007) find that weight gain spreads through a population like a contagious disease owed to individuals being influenced by their friends and relatives; though, Cohen-Cole and Fletcher (2008) re-estimate these effects and find them greatly reduced and not significant once a more thorough econometric methodology is utilised. Elsewhere, Maximova et al. (2008) have shown that young people's perceptions of weight is dependent on the weight of their parents and friends. Similarly, Blanchflower et al. (2008) describe a 'keeping up with the Jones weight effect' where weight perceptions and dieting are influenced by the individuals that surround us. Overall they suggest that individuals have different comparison groups, with the highly educated holding themselves to a 'thinner' standard. Oswald and Powdthavee (2007) argue that people have a utility function defined on relative weight and hence choose their weight with reference to the weight of their peers. Given the higher rates of obesity amongst the poor, this peer effect is likely to create an income gradient in weight perception and weight control, which further reinforces the obesity-income gradient. In addition, weight misperceptions among people of lower income may be explained by lower levels of health knowledge. Alternatively, those with higher levels of education may simply be