



## Assessing the impact of obesity on labor market outcomes

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### ABSTRACT

We study the effect of obesity on employment, using rich data from the British National Child Development Study (NCDS). The results show a significant negative association between obesity and employment even after controlling for a rich set of demographic, socioeconomic, environmental and behavioral variables. In order to account for the endogeneity of obesity, we use and assess instruments introduced by Cawley (2004); the obesity status of biological relatives. Using parental obesity as an instrument, we show that the association between obesity and employment is no longer significant. Similar results are obtained in a model of first differences. We provide a number of different checks on the instruments, by exploiting the richness of the NCDS data. The results show mixed evidence regarding the validity of the instruments.

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### 1. Introduction

A growing literature focuses on the importance of non-traditional traits such as physical appearance, personality and birth order on labor market success (Hamermesh and Biddle, 1994; Mueller and Plug, 2006; Kantarevic and Mechoulan, 2006). The literature on physical appearance mainly considers three attributes: attractiveness, body mass and height. To date, the effect of body mass has received most attention, reflecting concerns about the sharply increasing obesity rates found in most Western countries (OECD, 2005, p. 87). Naturally, this raises the question about any adverse labor market consequences.

Obesity increases the risk of various health problems such as cancer, stroke, diabetes, asthma, hypertension, depression and arthritis (Abbott et al., 1994; Pi-Sunyer, 2002), which may affect the individual's capacity to work. There are, however, alternative explanations for the effect

of obesity on labor market outcomes. Employers may discriminate against obese workers (e.g. Hamermesh and Biddle, 1994; Baum and Ford, 2004; Rooth, 2009; Lundborg et al., 2010). Discrimination is not always clear as in some jobs, such as sales, physical appearance may be directly related to productivity. Furthermore, obesity may be related to non-desirable personality traits potentially affecting productivity. For instance, Puhl and Brownell (2001) and Sobal (2004) revealed public beliefs about obese people, they are thought to be lazier and less socially and intellectually skilled than their non-obese counterparts.

In this paper, we focus on the effect of obesity on employment. The previous literature has primarily looked at the effect of obesity on wages. The effects of obesity on employment are not necessarily the same as the effect on wages. If obese workers are less productive or if employers discriminate against obese individuals, they may receive lower wages but still be employed. However, if wages are not fully flexible or if obesity causes serious health problems, the effect of obesity on employment might be severe. In line with this, Rooth (2009) found strong indications of discrimination against obese workers by measuring employer callbacks on fictitious job applications to real jobs, where pictures of an obese or non-obese

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person were randomly assigned to similar applications. Focusing on wages alone may therefore leave out an important aspect of the effect of obesity on labor market outcomes. This may hold particularly for groups that have traditionally lower participation rates, such as females. The literature on the effect of obesity on employment is limited, however, and have reached mixed conclusions. In Cawley (2000a,b) and Norton and Han (2008), no effect of obesity on employment among US men and women is obtained. Morris (2007), on the other hand, finds a significant and negative effect for both genders in the UK.

Investigating the effect of obesity of labor market outcomes is complicated by potential reversed causality and endogeneity problems. Reversed causality may arise, for instance, because energy dense fattening food is relatively cheap, and lower wages or unemployment increases the demand for such food. Furthermore, there may be unobserved characteristics that vary systematically between obese and non-obese people, and these factors may also affect employment. For instance, people with high discount rates may be more prone to weight-gaining consumption. At the same time, high discount rates make investments in human capital (and thus future labor market outcomes) less attractive (Cawley, 2000a,b, 2004; Baum and Ford, 2004).

We contribute to the literature on the effect of obesity on labor market outcomes. For this purpose, we use data from the British National Child Development Study (NCDS), which is a longitudinal study on around 17,000 individuals born in Great Britain in the week of March 3–9, 1958, who are followed up to 2004, when they were 46 years old. The majority of studies on obesity and labor market outcomes is conducted in a US context and we thus contribute to the small literature examining the topic in a British context.

The NCDS has not often been used to study the effect of obesity on labor market outcomes. However, the data have a number of advantages. Since NCDS follows people from birth, it contains extensive information on early life conditions that could potentially affect both obesity and labor market outcomes. Even more importantly, it records the height and weight of both the respondent and the respondent's mother and father, allowing us to use the obesity status of a respondent's parents as instruments. The idea of using the obesity status of biological relatives as an instrument was introduced by Cawley (2000a,b), who argued that the strong association in body size between a parent and a child mainly reflects genetic factors, making it potentially useful as an instrument. The body mass index of biological relatives has since then been used as an instrument in a relatively large number of studies (Cawley, 2004; Burkhauser and Cawley, 2004; Cawley et al., 2005; Brunello and D'Hombres, 2007; Kline and Tobias, 2008; Atella et al., 2008; Shimokawa, 2008; Greve, 2008; Trogdon et al., 2008; Renna et al., 2008; Davey Smith et al., 2009).<sup>1</sup>

Using the obesity status of parents as an instrument, instead of that of siblings or children, has certain advantages. First, since parental obesity is available for all respondents, we do not have to rely on the obesity of a sibling or a child, which would restrict the sample to only those where information on a sibling or a child is present. Second, since we have two instruments we are able to perform overidentification tests on our instruments. We use these tests to assess the use of parental obesity as an instrument. It should be noted that the NCDS data has not been used before to estimate the causal effect of obesity by using a biological relative's weight as an instrument.

Using parental obesity status (or any biological relatives obesity status) as an identification strategy depends on the assumption that there are no other pathways than via the respondent's obesity status in which parental obesity affects the respondent's labor market outcomes. Alternative pathways may be present if genetic or non-genetic factors which affect obesity also have a direct impact on labor market outcomes. There is some evidence, based on twin and adoption studies, suggesting that the association in body weight between biological relatives is due to genetics, and that shared environmental factors play no role. However, this finding is not uncontroversial. We, therefore, exploit the richness of the NCDS data, and contribute to the literature by providing some checks for the appropriateness of using a biological relative's weight as an instrument. Such tests have been rare in the literature so far.

To assess our instrument, we start by exploiting the rich data in the NCDS, and show that the strong association between the respondent's obesity status and parental obesity is virtually unaffected when we condition on environmental factors during childhood and adolescence. Conditioning on these factors at the same time makes the association between the respondent's obesity status and employment status weaker. This might be taken as evidence that it is mainly genetic factors which affect the intergenerational association in obesity. We further test this by exploiting information on adopted children in our data. If the association is only due to genetics, then one would expect no association between the obesity status of adopted children and their adoptee parents. Indeed, we find that the coefficient for adopted children is close to zero, again suggesting that environmental factors play a small role. These results, in sum, provide at least suggestive evidence that parental obesity mainly predicts genetic variation in the respondent's obesity status, making it potentially useful as an instrument.

Using parental obesity as an instruments would still be invalid, however, if the same genes that predict obesity also predict labor market outcomes. We, therefore, also exploit the panel feature of the NCDS and conduct regressions in first differences. This removes all unobserved time-invariant heterogeneity, such as genetic factors correlated with both obesity and labor market success.

In our data there is a negative correlation between obesity and the employment probability among women and men. Although the sizes of these associations become smaller after controlling for an extensive list of controls for

<sup>1</sup> Two recent studies have used specific genetic markers for obesity as instruments (Norton and Han, 2008; Ding et al., 2009). Other papers have used instruments providing non-genetic variation, such as the average BMI of individuals in the same health authority area (Morris, 2006, 2007) and sibling sex composition (Lundborg et al., 2007).

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