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Parental misclassification of child overweight/obese status: The role of parental education and parental weight status

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ABSTRACT

Childhood overweight and obesity is a major public health challenge for policymakers in many countries. As the most common supervisors of children's activities, parents have a potentially important role to play in obesity prevention. However, a precondition for parents to improve their children's diets, encourage them to be more physically active, or take them to see a doctor about their weight is for the parent to first recognize that their child is overweight or obese. This paper examines the extent of parental misclassification of child weight status, and its correlates, focusing on the role of parental education and the parent's own obesity status. We find evidence that, among non-obese parents, those who are better-educated report their child's weight status more accurately, but among obese parents, the better-educated are 45.18% more likely than parents with lower secondary education to give a false negative report of their child's overweight/obesity; this may reflect social desirability bias.

1. Introduction

Worldwide, the prevalence of childhood overweight and obesity rose 47.1% between 1980 and 2013 (Ng et al., 2014). In 1980, the prevalence of overweight and obesity combined in developed countries averaged 16.9% for boys and 16.2% for girls; by 2013 it had risen to 23.8% for boys and 22.6% for girls (Ng et al., 2014). This increase in the prevalence of youth obesity has imposed substantial costs on health care systems (Trasande and Chatterjee, 2009; Trasande et al., 2009). The greatest costs of childhood obesity, however, may be due to it increasing the risk of adult obesity, which is much more expensive. About a third of obese preschool children, and about half of obese school-age children, become obese adults (Serdula et al., 1993), and obesity in adults imposes significant costs on the health care system (Cawley et al., 2015b). Medical care costs are not the only adverse consequence of childhood obesity. Heavier children exhibit delayed skill attainment as preschoolers, tend to earn lower grades in school, and suffer discrimination and stigma (Cawley, 2010; Cawley and Spiess, 2008; Sabia, 2007; Puhl, 2011). Moreover, numerous studies using data from various developed countries have concluded that obesity lowers wages for adults – see the review in Cawley (2015).

In light of these levels and trends, policymakers in a number of countries have responded with a variety of policies to promote healthy eating, physical activity and healthy weight. However, as noted in previous studies such as Golan et al. (1998), parents have a key role to play in regulating their children's diet and exercise. Indeed, a precondition for parents to improve their children's diets, encourage them to be more physically active, or take them to see a doctor about their weight is for the parent to first recognize that their child is in fact overweight or obese. Therefore, one factor that could slow the identification of youth obesity, and reduce the effectiveness of programs to prevent and reduce childhood obesity, is parental misclassification of their child's weight. That is, if the parents of truly overweight or obese children believe that their child is not overweight or obese, they may not seek medical advice, modify the child's diet, or promote physical activity by the youth (Safefood, 2012). They may even disregard medical advice or discourage the child from changing their behavior. Thus, according to Rietmeijer-Mentink et al. (2013) and Young et al. (2010), the first step in treating childhood obesity is to identify it.

A large number of previous studies have examined (i) the extent to which parents, and mothers in particular, accurately report their child's height and weight, which can be used to calculate their body mass index (BMI), and (ii) the accuracy of subjective parental assessments of their child's weight status based on survey

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questionnaires or image grading. Studies which have examined the accuracy of parent-reported height and weight have found significant errors across a range of dimensions – see, for example, Davis and Gergen (1994), Scholtens et al. (2007), Dubois and Girad (2007) and Huybrechts et al. (2006).[1]

An alternative to asking parents to report their child's height and weight is to instead ask them to report their perceptions of their child's weight status. Again, a large number of previous studies have examined the extent to which such perceptions are consistent with more objective measures, such as BMI calculated from measurements. The findings from systematic reviews (Tompkins et al., 2015; Rietmeijer-Mentink et al., 2013; Doolen et al., 2009; Towns and D'Auria, 2009; Parry et al., 2008) generally show high levels of parental misclassification of their child's weight status. The methodological quality of many of these studies has been questioned (Rietmeijer-Mentink et al., 2013), because of concern related to sample sizes which are often small and unrepresentative, a lack of robust multivariate analyses, limited sets of control variables, as well as a shortage of studies that look at misclassifications over time.[2] Doolen et al. (2009: 165) concluded that the reasons for these misclassifications "are clearly missing from the research literature" and that "further research needs to explore the reasons for this phenomenon".

Only a few studies to date have considered the socio-economic determinants or correlates of misclassifications and those that have done so have tended to focus on the role of parental education.[3] In general these studies have found that higher levels of parental education are associated with a lower probability of misclassification (Baughcum et al., 2000; Boutelle et al., 2004; Manios et al., 2009; De Hoog et al., 2012; Hearst et al., 2011). On the other hand, Hudson et al. (2012) found no significant correlation between parental education and parental misclassifications using data for the same country we examine (the Republic of Ireland, henceforth Ireland).[4]

Within this context, the purpose of this paper is to examine: 1) the extent of parental misclassification of child weight; and 2) the correlates of such classification error, focussing in particular on the role of parental education and how it interacts with the parent's own obesity status. In other words, it examines the extent to which parents' subjective classifications of their child's weight status are consistent with more objective clinical classifications of weight status based on independently measured weight and height, as well as analysing what factors are associated with any inconsistencies.

We investigate these research questions using data from the Growing Up in Ireland (GUI) study, a nationally representative longitudinal survey of children living in Ireland who were aged 9 years in the first wave of the study, and their parents. The richness of the dataset allows us to address many of the weaknesses and gaps in the existing literature; in particular, it allows us to examine more fully how misclassifications relate to parental education. Ireland has, like many nations of the world, experienced a rise in the prevalence of childhood obesity. In 2013, the prevalence of overweight and obesity combined in Ireland was 26.6% for boys (<20 years) and 26.5% for girls (<20 years) – see Ng et al. (2014). It is estimated that overweight and obesity raise medical costs in Ireland by 398.6 million Euro per year, or 2.8% (Perry, 2012).

The paper adds to the literature in a number of ways. First, it presents a much more in-depth analysis of the potential correlates of misclassifications than previous studies, focussing in particular on the role of parental education and parental weight status. While a small number of studies to date have considered these variables independently, none has examined how they might interact. This, as we demonstrate, is of critical importance in understanding the role of these respective factors on parental misclassifications. Second, we provide an assessment of different types of misclassifications. Third, the GUI data are nationally representative with a significantly larger sample size than almost every other study undertaken in this area to date. Fourth, the data also allow an examination of the accuracy of children's classification of their own weight status. Thus, overall our analysis provides a much more comprehensive and robust assessment of the extent and potential drivers of misclassifications of child weight status.

The paper is structured as follows: Section 2 presents a detailed description of the data and variables that are used, Section 3 sets out our empirical approach, while Section 4 presents the main empirical results. Section 5 contains details of a number of extensions to the main analysis and Section 6 discusses the implications of our results and findings and concludes.

2. Data: Growing up in Ireland (GUI)

The data analysed comes from the first wave of the GUI survey conducted between September 2007 and June 2008. The GUI is a nationally representative face-to-face survey of children living in Ireland, which includes interviews with their parents, teachers and school principals, and examines issues concerning children with a view to assisting in policy formation and service provision for children. Wave 1 included 8568 children, representing approximately 14% of all 9 year olds in Ireland at that time, and used a two-stage clustered randomised sampling approach of 910 randomly selected schools. Further details of the survey, including the sampling procedures, are discussed extensively in Murray et al. (2009).[5]

The GUI data include a number of variables of relevance for the analysis in this paper, both in terms of identifying misclassifications of child overweight/obesity and for analysing their correlates.[6] First, primary care givers (PCGs), the vast majority of whom were the child's mother,[7] were asked the following question[8]:

Do you think the Study Child is: (1) Very underweight; (2) Moderately underweight; (3) Slightly underweight; (4) About the right weight; (5) Slightly overweight; (6) Moderately overweight; (7) Very overweight; or (8) Don't know.

This is one of two key variables that we use to identify misclassifications within the GUI sample and a number of points

[1] For a thorough analysis of the evidence on parent-reported height and weight as sources of bias in survey estimates of childhood obesity, see Weden et al. (2013).

[2] In terms of methodological weaknesses that were identified, the authors also noted that it was unclear in 81% of studies reviewed whether parents were unaware of the results of the weight measurement of their children before giving their perception of the child's weight status. This is not an issue with our survey data where parents were asked to give their perceptions of their child's weight status prior to physical measurements.

[3] One exception is Layte and McCrory (2011) who, using the same data as in this paper, examined the association between misperceptions and social class. They found that, controlling for the child's actual weight and other factors, social class had no impact on the perception of overweight by the mother. They did not consider the role of education.

[4] Hudson et al. (2012) use data from the National Children's Food Survey and the National Teen Food Survey, whereas this paper uses data from the Growing Up in Ireland survey.

[5] For a recent application of this data examining socio-economic gradients in childhood obesity, see Walsh and Cullinan (2015). The data were also recently used to analyse the causal impact of obesity on self-rated health in Cullinan and Gillespie (2016).

[6] Importantly, while the GUI data contain a wide range of variables for the so-called 'Study Child' and her/his parent(s), there is very little relevant information provided on the child's siblings, apart from age and gender.

[7] Secondary care givers (SCGs), where present in the household, were generally the child's father. SCGs were not asked this question in either wave.

[8] The precise question used is set out in the Appendix A.