



Low expectations: Do teachers underestimate the ability of overweight children or the children of overweight mothers?☆



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ABSTRACT

Using the first wave of the Growing Up in Ireland Survey of nine year old children we examine whether a teacher's assessment of their pupil's academic ability is influenced by the weight status of the child and/or the child's mother. Multivariate regression analyses of the teacher's assessment, controlling for the child's actual test performance, their BMI, their mother's BMI, other socio-demographic and teacher characteristics were undertaken. The study highlighted that child BMI was not a significant determinant but that children whose mother was obese were more likely to be rated as below average in reading and in maths compared to those whose mother was leaner, after adjusting for their measured ability. The potential for mother's weight status to influence teachers' assessments of their children's perceived ability could have long term ramifications for educational outcomes and warrants further study.

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1. Introduction

When teachers interact with students they develop expectations of their academic performance and social skills (Dusek and Joseph, 1983). What influences these expectations has been the focus of debate for some time (Jussim et al., 2009; Jussim and Harber, 2005). That associations exist between teachers' expectations and characteristics of the student as well as their parents has though been confirmed in several studies that examined inter alia the role of socio-economic and minority status (Dusek and Joseph, 1983; Hinnant et al., 2009; Auwarter and Aruguete, 2008; De Boer et al., 2010; Jussim et al., 2009; Jussim and Harber, 2005; Glock et al., 2013). Adiposity – whether that of the child or of the parent – may also influence teachers' expectations. This may indeed help explain observed disparities in educational achievement, found among children differentiated by weight status (Kaestner et al., 2011; Caird et al., 2011). While research has shown that obesity is related to delayed skill acquisition in children as young as two years old (Cawley and Spiess, 2008), echoing an extensive literature on bias related to obesity (Cawley, 2004, 2015; Meyerhoefer and Yang, 2016) that educational outcomes may also

be influenced by bias is conceivable. Indeed given a literature replete with examples of negative attitudes towards the obese and obese women in particular whether in labour markets (Meyerhoefer and Yang, 2016; Asgeirsdottir, 2011) healthcare (Brown, 2006; Brown et al., 2006; Budd et al., 2011; Mulherin et al., 2013) education (Swami and Monk, 2013) and even the home (Crandall, 1995), the need to consider carefully the potential for indirect as well as direct mechanisms by which negative attitudes may become manifest is important. Females typically adopt the role of primary carer, and other than the child, it is they who are most likely to come into contact with teachers and around whom indirect stereotyping might arise.

Negative attitudes towards obese children among physical education teachers has been reported in the literature (Lynagh et al., 2015). While others have not found evidence that teachers' perceptions of pupils' ability were influenced by body shape (Shackleton and Campbell, 2014) this research ignores the possibility that perceptions may be framed and expressed more subtly than through direct correlation with the child's adiposity. For example, just as lower expectations among teachers in respect of children whose parents are of lower socio-economic status (Auwarter and Aruguete, 2008; Rist, 1970; Speybroeck et al., 2012; Hauser-Cram et al., 2003), may indicate the use of parental achievements/characteristics to predict those of the child so too may the adiposity of the mother. The high correlation between parental and child obesity (Cawley and Meyerhoefer, 2012), for

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example, may see teachers use the former as a more robust predictor of the child's lifecourse given idiosyncratic shocks (such as growth spurts and illness) that can distort adiposity captured at particular moments in cross-sectional surveys. Given the negative impact of female obesity in particular, examining the potential for mother's to be the conduit through which negative attitudes are formed seems worthy of investigation. An exploration of negative attitudes related to obesity may thus require an analytic approach that makes reference not just to the obesity status of the child but to that of the mother also.

In this study we sought to determine whether adiposity of the child, its mother's, or both were associated with the teacher's perceptions of the child's academic ability. In particular, the study examines whether the adiposity of the child and/or its mother is negatively associated with respect to teachers' expectations of the child's performance in maths and reading controlling for actual test scores, other socio-demographic characteristics of the child's family, teacher characteristics and teachers' reported observations of the child's diligence at school. We examine potential non-linearities in adiposity status to provide a focus on obesity. The implications of our findings for research and policy are discussed.

2. Data and methods

2.1. Data

Data were obtained from the first wave of the Growing Up in Ireland (GUI) survey, a longitudinal cohort study of a nationally representative sample of over 8500 children from 900 schools in Ireland (Williams et al., 2011). The data were collected between September 2007 and May 2008. As part of the survey, information was collected from the child, their parents/guardians, their school teacher, school principal, and child-minder (where relevant). Among the information gathered was measured weight and height for the child and their parents (but not their teachers). While previous work has shown the percentage of body fat to be a superior measure of obesity to BMI (Burkhauser and Cawley, 2008; Wada and Tekin, 2010; Doherty et al., 2014), only height and weight were captured in the GUI survey and only BMI was therefore available to model adiposity. Further details on the survey design and sampling framework can be found at Murray et al. (2011).

The dependent variable in the analyses were the teacher's rating of their students' abilities in maths and reading. Specifically teachers were asked "How would you rate the Study Child's academic performance in the following areas relative to children in his/her age group" and they were given the option of stating: "below average", "average" or "above average". Teachers were asked to rate the performance separately for maths and reading. To examine the relationship between BMI and teachers' assessment of students' ability we controlled for BMI in models with respect to each subject. Given the possibility of the mother's BMI being used to predict that of the child, the BMI of the subject's mother was also included in estimated models. While BMI was taken for all primary caregivers as in approximately 99% of cases children's main caregiver was also their mother, the BMI of mother only was used when modelling caregiver BMI. In the main analyses the mother's and child's BMIs were modelled as continuous variables. In robustness checks where mothers' BMI was modelled as a categorical variable, the categories were normal weight (BMI: 18.5–24.9), overweight (BMI: 25–29.9), obese 1 (BMI: 30–34.9), obese 2 (BMI: 35–39.9), obese 3 (BMI >= 40).¹

¹ Underweight mothers represented less than 1% of the sample and they were dropped from the analysis.

A second key explanatory variable in the analysis was the students' actual performance in maths and reading – our hypothesis being that were teachers to systematically underestimate performance when actual performance was controlled for, this would provide stronger evidence of bias on their part. As part of the study, each child completed a standardised, validated test of their abilities in maths and reading (the "Drumcondra² test") (Kellaghan, 1976). These tests were administered by a trained study fieldworker who visited each child's school. The tests have been developed for Irish school children and are grade-specific linked to the national curriculum (Layte and Mccrory, 2011). Teachers were blinded to the test scores and were not present at the time of test administration. Test scores were normalised and entered into models as a series of categorical variables representing the quartile of the relevant distribution (maths and reading) in which the child resided.

A number of other covariates were included among specifications of our models based either on findings from previous studies, or where a relationship might be plausibly expected to exist. Among those controlled were gender of the child, (coded one if female and zero otherwise), the child's age relative to classmates – in Ireland children can enter education if aged four in September when the school year commences. Children who are older relative to their peers may experience an advantage as a result (Sykes et al., 2009) that might impact on teacher perceptions. In analyses where this was controlled for using a dummy variable that detailed whether the child was born September to December, equal to one, with those born in other months equal to zero.

A range of familial socio-economic characteristics were also controlled for in specifications of the models, these included mother's education shown by Dubow et al. (2009), for example, to be a significant predictor of educational outcomes and that might reasonably be inferred therefore to affect teachers' perceptions of the child. A categorical variable represented mother's education (coded as zero for mothers with no education or primary level education only, coded as one if the mother had a secondary level education and coded as two if the mother had a third level qualification) was also included. The mother's employment status – (Ermisch and Francesconi, 2000), age (Cameron and Heckman, 2001), and marital status (McLanahan and Sandefur, 1994) were also included as explanatory variables based on relationships reported in the literature; children of stay at home mothers, older mothers and those living with a partner having higher educational attainment outcomes. Employment status was coded as one if the mother was employed and zero otherwise; marital status as one if the mother was living without a partner and zero otherwise; and mother's age in years. Household income was included as an explanatory variable based again on literature (Davis-Kean, 2005), children of those with higher incomes having higher educational outcomes. Household income was specified as annual equivalised household income so as to better reflect competing demands on resources. Equivalised income is calculated as disposable income divided by equivalised household size³ (Doherty et al., 2013). The number of years teaching experience (in years) and teacher's gender (one if female and zero otherwise) were also included among the main models based on the premise that more

² It is common practice for schools to assess pupils using standardised tests such as the *Drumcondra Primary Reading Test-Revised* (DPRT-R) and the *Drumcondra Primary Mathematics Test-Revised* (DPMT-R). Schools are also now required to report results of Standardised tests at the end of 1st class (or beginning of 2nd class) and the end of 4th Class (or beginning of 5th class).

³ The equivalence scales reflect those used by government in Ireland and assign a weight of 1 to the first adult in the household, 0.66 to each subsequent adult (aged 14 years or older living in the household) and 0.33 to each child (younger than 14 years).

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