

# Mothers as smoking guns: Fetal overnutrition and the reproduction of obesity

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## Abstract

Mothers are expected to monitor their children's dietary intakes and physical activities and are blamed for over feeding their children if they are obese. Women are also urged to manage their own weight in preparation for conception and during pregnancy in order to reduce complications associated with maternal obesity at childbirth. Through a theoretical lens of maternal blame, we argue that Australian media representations of scientific studies of the fetal overnutrition hypothesis extend behavioural maternal blame to the interiority of women's bodies. Women's intrauterine environments are positioned in the media as central to the intergenerational transmission of obesity, with women portrayed as responsible for passing obesity on to their children (and grandchildren) via biology and ill-informed 'lifestyle choices'. Linking in with historical and contemporary discourses of maternal bodies and individual responsibility, the implications of the 'double damage' caused by women entails a concerning return to essentialism in which women's bodies are being largely blamed for producing and reproducing obesity across generations.

## Keywords

Fetal origins hypothesis, maternal obesity, mother blame, pregnancy, reproduction

In March 2009 an article in the daily State newspaper of South Australia (*The Advertiser*) featured a large photograph of a smiling mother and her newborn baby, warning that 'health problems are passed on through generations' (Stewart, 2009). The headline to the story – 'Mothers' smoking gun' – referred to a cohort study

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conducted by researchers at the University of Adelaide (including two authors of this article) which explicitly states that overweight, pregnant women are more likely to have children, even grandchildren, who are overweight. A similar news item in Australia's national circulation paper (*The Australian*) in the previous month claimed that 'obese women are more likely to have children with a range of birth defects' (Taor, 2009). The warnings are clear – obesity in pregnancy is potentially damaging and it is mothers who are held responsible for their children's ill health.

The media conflation of women's reproductive bodies with smoking guns reflects recent paradigmatic developments in scientific research about the origins of health and disease, and how adult chronic disease might be determined by the 'womb environment'. This new paradigm, termed Barker's hypothesis (or the fetal origins hypothesis), has led to maternal obesity now being understood to contribute to obesity in children through intra-uterine factors that alter fetal metabolism regarding growth, fat deposition, and insulin regulation (Oken and Gillman, 2003). As a result, the interiority of women's reproductive bodies is brought sharply into the media limelight not only as a causal agent in the obesity 'epidemic', but also the (potential) solution.

We critically examine how the fetal origins hypothesis is reported in popular print media, arguing that reproduction (and more specifically women's reproduction) is now a key discursive site in which intergenerational cycles of obesity are being culturally produced and reproduced. To provide evidence of these new discourses in which the bodies of obese, pregnant women are being implicated we examined the reporting of scientific research in Australian print media. In addition to mothers being held legally and morally culpable for overfeeding and neglect of fat children, we found that the reporting of scientific research compounds blame by suggesting that women are responsible for 'programming' their baby for a lifetime of obesity. A new and powerful meta-discourse has emerged in which women are blamed for *both* their reproductive physiology and their social role as mothers, thus constructing women as potentially contaminating future generations by creating obesity lineages.

Of course this discourse of blame did not appear out of thin air; blaming the bodies and behaviours of pregnant women for misshapen fetuses lingers on from our historical understandings of disease causation. Mother blame is not a new phenomenon and historians (Ladd-Taylor and Umansky, 1998) and feminist scholars (Litt, 2000; Singh, 2004) have noted how women have long been accused of smothering children and causing all manner of 'ills' such as homosexuality, schizophrenia, autism, and anorexia to name a few. While the concept of mother blame has 'extraordinary elasticity' (Blum, 2007: 203), we argue that the shifting historical discourses of maternal appetites, the scientific location of obesity through the fetal origins of disease, and the popularisation of this 'new science' now provide a singular space for the overweight, maternal body to take centre stage. Fat, pregnant bodies are constructed as bio-cultural anxieties, distilling biological and social causes into the one embodied location. Coupled with a neoliberal agenda that emphasises self-governance and individual responsibility, this powerful meta-discourse (Nerlich, 2009) provides a compelling web of individual and gendered blame for the obesity 'epidemic'.

## The obese, pregnant body

Demi Moore's infamous *Vanity Fair* cover in 1991 was a sensational prelude to the idea that good mothers are closely aligned with the ideal neoliberal citizen. Since her cover, photos and stories of pregnant and post-partum celebrities have proliferated in various popular media. Although the consumption of celebrity pregnancies (Danni Minogue, Britney Spears, Angelina Jolie, Heidi Klum, and Nicole Richie) – with their neat bumps, well supported breasts, glowing skin, and radiantly energised appearance – communicates a distorted image of expectant mothers and emphasises the social controls that ordinarily discipline mothers' bodies, a fetishisation of pregnant celebrities (and 'yummy mummies') has helped to shape new standards of bodily deportment and appearance toward which the pregnant woman is expected to aspire. Foucauldian issues of surveillance and pregnancy policing have been well documented in feminist literature (see Fox et al., 2009; Longhurst, 2008; Ussher, 2006), and the price of mothers-to-be not complying with the dominant ideals of 'good motherhood' are high. Women who don't self-regulate or ignore dominant pregnancy practices are especially beholden to public scathing, as they present what Skeggs (2005: 968) calls a 'constitutive limit to propriety' within both celebrity culture and wider social life.

Once considered healthy, the storage of fat was an acceptable and 'natural' part of pregnancy. Indeed, pregnancy, as understood in recent 'western' history, was a period in which a woman could, albeit temporarily, guiltlessly gain weight; 'eat for two' and rest from exercise. In recent times, however, anxieties about the spread of the 'obesity epidemic' has led fat to be demonised and pathologised as a disease (see Campos et al., 2005; Moffat, 2010; Murray, 2008; Orbach, 2009) no matter which body it appears on. In a climate where obesity has become a potent signifier for neglect of self (and others), pregnant women are no longer encouraged to eat for two (Bell et al., 2009; Keenan and Stapleton, 2010) and a new regime of dietary practices and recommended weights for mothers-to-be and pregnant women has been promoted by clinical, public health, and biomedical experts.

Good mothering practices now begin *before* conception (Fox et al., 2009; Lupton, 1996), and preconception care is promoted as 'the most loving and responsible choice you and your partner can make together, not only for you and your child's health, but also for future generations' (McDowell 2005, cited in Possamai-Inesedy, 2006). Obese, even overweight, mothers-to-be should exercise and lower their calorie intake in order to reduce their Body Mass Index (BMI). Additionally, and like all women, they are expected to ensure the optimal conditions for fertility by avoiding substances such as caffeine, alcohol, and nicotine, and supplementing their diets with folic acid and other vitamins and minerals. Vigilant attention to their dietary requirements should continue throughout pregnancy, with a regular intake of folic acid in the first trimester and scheduled blood tests to detect nutritional deficiencies at routine intervals. Still abstaining from alcohol and other toxins and consuming a well-balanced diet, the mother should ideally breastfeed, then, when her baby is eventually weaned, nutritious meals should be prepared.

Effectively, the ‘good mother’, responds to a discourse that requires her to act responsibly (Goodwin and Huppertz, 2010: 5) and to perform labour-intensive (Hays, 1996) food preparation practices to avoid any potential risks and to nourish the body of her child.

### **‘Biological postcards’: The popularisation of Barker’s hypothesis**

These disciplinary regimes reflect not only an obsession with the management of ‘healthy’ bodies, but are now linking ‘pre-pregnancy appropriate weight, weight gain and nutrition in pregnancy with satisfactory fetal outcomes and increasingly, with infant health over the life-course’ (Keenan and Stapleton, 2010: 371). This new attention to the fetus not only reflects a concern for fetal personhood (Ruddick, 2007) but is supported by scientific developments in the early origins of disease that trace chronic disease in adults back to the intrauterine environment.

From the late 1980s, research conducted by UK physician and epidemiologist David Barker and his colleagues advanced the theory that chronic disease originated, at least in part, in early life. Barker and his colleagues’ work (Barker, 1990; Barker and Osmond, 1986) led to a profound paradigmatic shift in medical understanding and knowledge, as low birth weight and intra-uterine growth retardation (caused by under-nutrition during fetal development) are presented as important indicators or signals of an elevated risk for many adult diseases (see Moore and Davies, 2008). In other words, many chronic adult diseases (especially diabetes and heart disease) are seen as having origins in the intra-uterine environment or early infancy (as well as being influenced by later environmental and life style factors). Throughout the 1990s, evidence of associations (statistical connections) between low birth weight and increased risk of chronic disease in adulthood accumulated. In 1995 the British Medical Journal named this ‘discovery’ the ‘Barker Hypothesis’, an expression that Barker rejected in favour of ‘the fetal origins hypothesis’ (Warin et al., 2011). In the science community this new insight became the focus of a major international research effort, and in 2010 *Time Magazine* called Barker’s hypothesis a ‘pioneering New Science’ that turned ‘pregnancy into a scientific frontier’ (Paul, 2010).

Although the main focus of the field now known as ‘developmental origins of adult health and disease’ has been on the effects of poor fetal nutrition and low birth weight, the issue of maternal and hence fetal overnutrition is of growing importance in the context of the current global obesity ‘epidemic’ (McMillen et al., 2008). By the early 2000s, the fetal origins hypothesis had become part of the child obesity lexicon, extending the understanding of obesity ‘back to the future’, and locating the origins and potentiality of obesity in the fetal environment.

Ebbeling and colleagues (Ebbeling et al., 2002: 475), in a landmark paper on the childhood obesity ‘crisis’, reported an:

intriguing hypothesis that prenatal overnutrition might affect lifelong risk of obesity. According to this hypothesis, maternal obesity increases transfer of nutrients across

the placenta, inducing permanent changes in appetite, neuroendocrine functioning, or energy metabolism . . . The implications of these findings are formidable: the obesity epidemic could accelerate through successive generations independent of further genetic or environmental factors.

The simplified ‘truth’ of the maternal origins hypothesis is that weight gain during pregnancy (or maternal obesity pre-pregnancy) can lead to fetal overnutrition and high birth-weight and contribute to childhood obesity independent of the family circumstance (La Coursiere et al., 2005).

Although many researchers investigating fetal origins in the scientific community speak of epidemiological uncertainty, caution, and degrees of imprecision (Moore and Davies, 2008; Susser and Levin, 1999; Wells, 2010), the media reporting of these ‘new scientific findings’ follows a simple storyline, and suggests that as women become too large, their fetuses also grow too large, and as a result ‘obesity is programmed in the womb’ (Paul, 2010). It is now frequently reported that: ‘women who are overweight or obese are 2 to 2.5 times more likely to have heavier babies . . . and larger babies create problems with delivery, and are more at risk of infection, diabetes, obesity and heart disease in later life’ (Shepherd, 2009). ‘Obese mums-to-be [are thus] urged to diet’ (Hall and Davis, 2009), as ‘the first nine months [can shape] the rest of your life’ (Paul, 2010). A reductive account of the fetal origins of disease is gold for scientific journalists, for obesity is both individualised and gendered, and characterised in the popular press as ‘a mother of a problem’ (Parker, 2009: 1).

A number of scholars have examined the media reporting of new scientific research and ‘have found that this type of media tends to lack critical coverage or comment by journalists . . . [and neglects] both the tentative nature of scientific inquiry and its political context’ (Parker, 2009: 4; see also Dyck, 1995). In spite of this, ‘scientific journalism’ relies on authoritative discourse, and locates its reporting in a context where ‘scientific knowledge continues to hold cultural authority as objective, rational and empirical’ (Parker, 2009: 2). Through this powerful legitimisation, scientific journalism becomes simultaneously a crucial source of scientific and public health information (Petersen et al., 2009; Boero, 2007; Saguy and Almeling, 2008) and ‘a key contributor to the shaping and definition of public health issues as social problems’ (Maher et al., 2010: 236). In relation to obesity, Monaghan et al. (2010) describe the media as ‘amplifiers/moralisers’ as they sensationalise, stereotype, and repeatedly focus on ‘dramatic’ or ‘moralising’ aspects of obesity.

## Our study

In 2009 we examined the reporting of obesity over a three-month period (1 January to 31 March 2009) in three metropolitan Australian newspapers – *The Advertiser*, *The Australian* and *The Sydney Morning Herald*. *The Sydney Morning Herald*, owned by Fairfax Media, and *The Australian*, of News Limited, are both

broadsheets. *The Australian*, the only national newspaper, has a broader nationwide audience than *The Sydney Morning Herald*, one of the main newspapers published in Sydney. Owned by Murdoch's News Corporation, *The Advertiser* is a tabloid-format newspaper and has the widest circulation in Adelaide. These three newspapers were selected to represent Australia's two dominant media outlets (Fairfax and Murdoch) and different readership and circulation. In order to collect data on visual images we opted against using text-based databases such as Factiva or LexisNexis and manually searched microfilm of the newspapers in our sample. We sourced 181 articles that included at least two of our search terms (obesity/obese AND pregnancy, parenting, child, eating, and diet), made multiple copies of each original (to allow for multiple analysis), and conducted a thematic analysis of text and visual images (see Bernard and Ryan, 2010). This involved identifying and describing both implicit and explicit themes within the data and critically exploring the relationships between these themes (for example, the recurrent links between childhood obesity and mothering). We also compared our results with two other Australian studies on media representations of maternal responsibility and obesity (Maher et al., 2010; Malik, 2007).

### *Maternal blame*

In our media sample, obesity was frequently constructed as a parenting issue and was closely aligned with food consumption. When obesity was constructed in terms of parental responsibility, the onus was on the parent to help their child lose weight for the specific purpose of reducing overweight-associated health problems. As we (Zivkovic et al., 2010) and others (Boero, 2009; McNaughton, 2011; Maher et al., 2010) have highlighted, this 'parent' is consistently coded as 'the mother', 'entrenching women's roles as managers of children's health and inequitably blaming them for childhood obesity' (Maher et al., 2010: 236).

As Malik (2007) notes in her discourse analysis of how mothers of overweight and obese children are portrayed in the Australian media, mothers are often singled out as the culprit of childhood obesity, with headlines such as: 'Fat mums set the trend for obese kids' (Fox, 2005); 'Fat kids? Yes, Mum's the word' (Cornes, 2006); and 'A large legacy – Overweight children may not have to look too far to find the reason – it could all be mum's fault' (Steele, 1999). 'Bad' mothers are morally denigrated as overly permissive ('Refrigerator mums') or relying on junk food ('McMums'), and often blamed for an epidemic in childhood obesity because of a perceived lack of education and lack of care for children. Even '30 years of feminist careerism' (Malik, 2007: 13) is used to blame women being time poor, not making 'home cooked' meals, and working outside of the home.<sup>1</sup> Such reporting effectively uses what Armstrong refers to a 'medical-moral authority' (2003: 189), in that women who fail to act 'maternally' are held morally responsible and culpable for adverse health outcomes in their children.

In contemporary 'western' societies mothers continue to be held culpable for making the wrong choices in regards to their fetuses' wellbeing. Pregnant bodies

and the fetuses they contain are increasingly accessible to the medical and legal professions for inspection and intervention (Epstein, 1995: 140). This has resulted in a shift in pregnancy discourses from maternal health to a concern with fetal personhood (Ruddick, 2007). In this new discourse of fetal personhood, mothers can be 'constructed as antagonistic towards their fetus, who becomes an object of collective concern, with its own public identity as the potential [healthy] citizen' (Longhurst, 1999, cited in Fox et al., 2009: 62). Fetuses and children are portrayed as innocent victims in need of protection from irresponsible parents, and in some cases mothers have been prosecuted for neglect and abuse in raising obese children (Zivkovic et al., 2010).

Media headlines amplify this failure of duty of care in terms of women's biological and social roles as mothers. Childhood obesity, it is claimed, 'might start in the womb' (Brown, 2009), and lies in the 'improper' nutrients supplied to fetuses by their mothers. In response to scientific reports in early 2009, Australian broadsheets had stories with headlines such as: 'Obese mums-to-be urged to diet' (Hall and Davis, 2009), 'Weighty problems born of bad diet in pregnancy' (Brown, 2009), 'Overweight mums putting newborns at greater risks' (Shepherd, 2009), 'Breastfed children least likely to be abused by mothers' (Taor, 2009) and 'Child neglect linked to [breast] feeding' (Medew, 2009).

The storyline to these headlines positions women as responsible for obesity and other chronic diseases in their children if they do not prepare their bodies for pregnancy, do not maintain their bodies during pregnancy, do not breast feed, do not put the right choices in lunchboxes or make nutritious, home cooked meals (Fox et al., 2009; Malik, 2007). Levels of responsibility attributed to mothers in relation to obesity occur at key stages of a child's development, travelling from the 'placenta to breast, from breast to lunchbox, from lunchbox to the dinner table' (Malik, 2007: 46). If women do not accept their 'natural' responsibilities as caregivers (both biologically and through social roles) they fall into what Blum (2007) calls a mother-valor/mother-blame binary. Mothers who fail to perform these key maternal activities are held 'responsible for [poor] child outcomes and thus for the health of families, future citizens, and the nation' (Blum, 2007: 202).

## **The permeable womb**

Locating the source of high birth-weight and childhood obesity in the generative female body marks a long history of association between women's bodies and that which is considered dangerous. Hailed as a monstrosity, Epstein (1995) and Ussher (2006) note that the female capacity for reproduction was considered an act of horror during the Enlightenment and, well before the scientific classifications of women's bodily parts and functions in the 19th century, birth disabilities and malformations were seen to signify the desires and cravings of mothers. According to a widespread belief, it was the passions bound up with maternal appetites that posed the greatest threat to the assumed permeability of pregnant bodies. A pregnant woman's appetite (including the ingestion of foods and drinks

and other sensory experiences such as fear and lust) was the explicit mechanism that transferred the effect from maternal environment to fetus (Kukla, 2005). Pregnancy was thus a dangerous process, for women's appetites increased, which in turn increased the possibility of harmful passions and appetites corrupting the fetus.

This historical assigning of responsibility for defective births to mothers' minds and bodies is, according to Epstein (1995: 155), indicative of a 'legacy of blaming the mother for her children's appearance and behaviour', and it 'serves to justify a wide range of strategies for containing women's minds by containing women's bodies'. In the 18th and 19th centuries, these measures included the restraining and hospitalisation of women in order to calm their minds, reduce their passions and decrease their chance of having a deformed infant.

While knowledge and practices surrounding pregnancy have significantly changed through time, Kukla (2005) suggests that preoccupations with pregnant bodies and the potentiality to harm the fetus still govern our imagination. In the news media, maternal obesity is constructed as harming the fetus, and it is the uncontrollable appetites of mothers-to-be that are blamed for the obesity epidemic: 'Blame your mother if you're overweight. Sounds Freudian and perhaps a bit mean, but a breakthrough study on obesity indicates that the path to becoming a podgy adult begins in the womb' (*Taranaki Daily News*, July 2007, cited in Parker, 2009: 1).

## **Intergenerational reproduction of obesity**

While several academics have highlighted the discourses of risk associated with such representations of maternal obesity (Keenan and Stapleton, 2010; McNaughton, 2011; Maher et al., 2010), we argue that the focus on intergenerational 'passing on' or transmission of fat from mothers to fetuses and babies constructs women and their reproductive capacities as potentially polluting. In line with social anthropologist Mary Douglas' concept of 'matter out of place' (1966), pregnant bodies are already symbolically marked as dangerous because the flow of reproductive fluids represents a transgression of bodily boundaries. Pregnant bodies expand with fat, fetus, and fluid. Corporeal boundaries become confused and blurred 'with the merging of two bodies' (Johnson, 2010: 252) as the fetus distorts the category of subjectivity, feeding from the mother's body through the placenta.

Fat too is 'matter out of place'. In a world of plenty, it represents gluttony, it provokes disgust, contravenes the standards of ideal beauty, and is at the core of our dietary restrictions and understandings of bodily purity (Murray, 2005). The boundary between the body and the world is challenged and reconfigured by fat, which represents an invasion of the body by the world (Huff, 2001). This invasion means that the fat body (which translates to personhood) is discursively constructed as a failed body project, existing as a 'deviant, perverse form of embodiment' (Murray, 2005: 155). Women who are obese and pregnant are thus all the more visible, and



doubly grounded in biology (Unnithan-Kumar, 2011) as reproductive, and as fat. Consequently, fat, pregnant women are a threat to the fetus: 'Researchers believe fat mothers pass their obesity to their children. Professor Ross Shepherd, from University of Queensland's Nutrition Research Centre, said initial studies indicated maternal obesity was related to overweight infants' (Steele, 1999: 3).

The contravention of order is not limited to the transgression of external and internal bodily boundaries: dangerous substances also course through the interiority of women's bodies. Bell et al. (2009) argue that in public health discourses on Fetal Alcohol Spectrum Disorder (FASD), smoking when pregnant, and childhood overnutrition, the exposure of the fetus to alcohol, drugs, or to fat carries the risk of damaging the child's health. 'Modes of seepage' permeate at the intersection of mother and fetus, a connection between placenta and umbilical cord, where matter can pass from one being to another in a process of feeding and excretion.

However, instead of exploring this placental process as a protective barrier that limits exposure of the fetus to harmful substances, the media (and some social scientists) completely ignore this clinical evidence and revert to a simplistic discourse in which pregnancy and the womb operate as a 'performance of contagion... where the passage of fluid inside the pregnant body, backwards and forwards between the pregnant woman and the fetal entity, enacts the process of contagion' (Maher, 2001: 201). Thus transmission of fat is no longer presented as a *potential* risk: instead intergenerational *certainty* of transmission is presented. Such logic couples appetite and emotions of guilt through successive generations of gendered blame: 'Gulp... You are what your Grandma ate... Research by the Victor Chang Institute shows that what mothers and grandmothers ate during pregnancy affects the health of a particular generation through the genes that are passed on' (*The Sydney Morning Herald*, 2006: 34).

### **Pregnant bodies as smoking guns**

The 'Mothers' smoking gun' (Stewart, 2009) article, cited at the beginning of this article, extends the potentiality of harm to the interiority of women's bodies. Despite the lead-researcher (one of the authors of this article) emphasising to the journalist that life course and intergenerational health are 'intertwined in very complex ways', the representation of obese women as 'smoking guns' took precedence. This representation feeds into a simplistic discourse of genetics and deviance; the smoking gun is a popular media metaphor for understanding complex medical relationships where there appears strong circumstantial evidence for a causal relationship between an exposure and a disease process, but where the direct causal mechanism is obscure or unavailable for direct observation. A smoking gun represents a gun that has already 'gone off' and as such presents indisputable evidence of a crime that has been committed. In this case, the crime is to be overweight and pregnant, thus harming the unborn fetus. It is not the microscopic or invisible workings of genes that are the gun, but obese women's bodies in pregnancy that are viewed as culpable.

The metaphor of (fat, pregnant) women as smoking guns is limited and inadequate, as the overnutrition hypothesis speaks to a bodily environment (the womb) that is very much mediated by the socio-economic environment in which the woman is situated. In reducing scientific understandings to genetic determinism, the interplay between bodies and their socio-cultural context is entirely overlooked. Within the fetal overnutrition hypothesis, there is no social circumstance without risk to the mother and the child. Every action involving a diet, food, and social practice is a compromise of interests, hazards, and likelihoods. Every action is constrained by a range of factors, whether social or biological. It is equally inadequate to attempt to explain the body of the mother as entirely reducible to either genetic or intra-individual motivational factors. The body of the mother is therefore a socio-biological accomplishment, the product of selection and survivorship pressures across generations that is in turn shaped by the social context within a lifetime.

The ways in which our bodily environment is mediated by diverse social factors is overlooked in the imagery of the smoking gun and in other print media claims that childhood obesity is *triggered* by 'mothers who eat junk food during pregnancy' (*Science Daily*, 2007) or that fat, pregnant women 'condemn their children to a life of overeating and obesity' (Connolly, 2008). In narrowing the frame of potential risks to the behaviour and biology of expectant women, the bodies of mothers are solely blamed for the misfeeding of their children, even in utero.

In this popularist discourse of the maternal lineage of fat transmission, men are absent from the production and reproduction of obesity across generations. It is assumed that the mother, and only the mother, influences the fetal environment and effects the transmission of obesity in her children. Recent studies, however, contest this position, finding the association between maternal and offspring BMI is comparable to that between paternal and offspring BMI, and concluding that intergenerational obesity involves both the father and the mother (Cole et al., 2008; Davey Smith et al., 2007; Hawkins et al., 2009; Kivimäki et al., 2007). And, among studies which find a stronger correlation between maternal and offspring BMI than that between paternal and offspring BMI, it does not necessarily follow that offspring BMI is an indicator of offspring fat mass during childhood (Lawlor et al., 2008). Lawlor et al. (2008: 491) caution that 'developmental overnutrition related to greater maternal BMI is unlikely to have driven the recent obesity epidemic'.

One interpretation of these data is that while there are specific clinical conditions in pregnancy that can directly influence the growth trajectory of the fetus, and thereby the offspring, these factors can be largely swamped within an environment where the majority of the adult population is overweight or obese. Hence, most of the variation in child BMI may be attributable to social factors common to both the mother and father, and not the direct biological effect of maternally mediated fetal nutrition operating specifically in pregnancy. Again, while the mother may be holding a smoking gun, so too is the father.

## Implications and conclusion

In this article we have shown how women's reproductive bodies are entangled in historical, scientific, and media discourses that intimately link the behaviours and biology of mothers with harm to the fetus. The reporting on the 'new science' of the fetal overnutrition hypothesis now extends the gendered nature of infant feeding practices to the interiority (including molecular and genetic levels) of women's bodies. Social environments have segued into intrauterine environments, in which fat, pregnant mothers can transmit obesity on to their children and future generations. Coupled with a political shift to individual responsibility and moralising discourses on obesity (Wright and Harwood, 2009), maternal obesity has become a powerful meta-discourse of blame.

Reductive understandings of obesity lead to reductive solutions. Blaming mothers for children's excess weight in both biological and social terms narrows the cause of 'the obesity problem' and therefore the solution to the individual bodies of women. Clinical suggestions of pharmacological contraception, gastrointestinal surgery, and the frequent use of weighing stations, all proposed to reduce obesity in women (e.g. Kral, 2004), girls, and young women, have proliferated yet are misplaced. Alarming, it is not only the corpulent pregnant woman who is to blame for obesity. Kral (2004: 1544), a US surgeon writing in the prestigious journal *Paediatrics* in 2004, argues that all women, even 'newborn girls', have the potential to become 'doubly damaging', both polluted and polluting, since fat is passed on through the female body. Accordingly, the only way to curb the obesity epidemic is to 'urgently' target girls and young women: '[f]rom birth to menarche, behaviour modification in mothers and children should be the first choice' in obesity prevention (Kral, 2004: 1544).

While Kral's view is extreme, McNaughton (2011: 1) argues that 'core assumptions at the heart of obesity science have been taken up uncritically in medical arenas focused on conception, pregnancy, and reproduction and that this is providing new opportunities for the surveillance, regulation, and disciplining of 'threatening (fat) female bodies'. We would agree that the Foucauldian gaze is firmly on the interiority of women's bodies, but we do not take the fetal origins field as a homogenous one. Some scientists working in this field do critique the narrow framing of obesity causality (Warin et al., 2011), arguing that this draws attention away from the very real structural inequalities in health care, education, and employment that are often felt hardest by women and minorities (Boero, 2009: 118). As Kukla (2008) notes, public discourse tends to focus on individual responsibility and displays of will-power (or failure of these), rather than the structural conditions that enable or undermine people's ability to make choices over the long term.

Longhurst (1999) noted that pregnancy is a biological process but exists within socio-cultural, economic, and political realms and is both spatially and temporally located. If we focus on the relationships between the social and the biological, and the ways in which they fundamentally interact with each other, then we have a much more powerful framework to understand gendered bodies and the social

determinants of health. Barker's work potentially offers a way to reduce social inequalities in health by giving attention to the living conditions, health, and nutrition of young women, pregnant mothers, and their children. Fetal origins, for example, provide a compelling framework to understand the high rates of obesity amongst women in disadvantaged populations. In a discussion of the obesity amongst the Pima Indians of Arizona, Wells argues that 'obesity arrived [most notably for the Pima women] in combination with poverty and US government rations of sugar and flour' (2010: 296). Poor maternal diets, gender bias through preferential feeding of male children, and fetal exposure to maternal work during pregnancy means that obesity is structurally embedded in socio-cultural contexts. Addressing women's livelihoods will bring particular benefits to their health, whilst further passing these on to subsequent generations.

Our research focuses on the ways in which the politics of mothering and individualised (gendered) responsibility is implicated in obesity debates and policy (Moore and Davies, 2008; Zivkovic et al., 2010). The media is central to this politics as it is part of a neoliberal paradigm that aims to individualise responsibility and individualise the biocultural. In its shallow approach, it reaches into women's bodies to locate obesity as simply a matter of good or bad mothering. Our research aims to invert the gaze to phenomena *outside the body* – to focus on bodily action, biological endowment, evolutionary history, and the organisation of society (and not just one of these). This approach means challenging the communication of knowledge that is strongly influenced by the media's power to characterise women's bodies (in both their reproductive capacities and social roles) in ways that make it seem 'natural' to blame them for obesity transmission across generations.

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### Note

1. For example, in January 2010 London buses and billboards were awash with the slogan 'Career women make bad mothers'. Following public outcry (predominately from working mothers), the Outdoor Advertising Association (who ran the ad campaign in an attempt to promote the effectiveness of billboard advertising) removed them.

### References

- Armstrong E (2003) *Conceiving Risk: Bearing Responsibility*. Baltimore, MD: The John Hopkins University Press.
- Barker D (1990) The fetal and infant origins of adult disease. *British Medical Journal* 301(6761): 1111.
- Barker D and Osmond C (1986) Infant mortality, childhood nutrition, and ischaemic heart disease in England and Wales. *Lancet* 327(8489): 1077–1081.
- Bell K, McNaughton D and Salmon A (2009) Medicine, morality and mothering: Public health discourses on fetal alcohol exposure, smoking around children and childhood overnutrition. *Critical Public Health* 19(2): 155–170.

- Bernard H and Ryan G (2010) *Analyzing Qualitative Data: Systematic Approaches*. Thousand Oaks, CA: SAGE.
- Blum L (2007) Mother-blame in the Prozac nation: Raising kids with invisible disabilities. *Gender & Society* 21(2): 202–226.
- Boero N (2007) All the news that's *fat* to print: The American 'obesity epidemic' and the media. *Qualitative Sociology* 30(1): 41–61.
- Boero N (2009) Fat kids, working moms, and the 'epidemic of obesity'. In: Rothblum E and Solovay S (eds) *The Fat Studies Reader*. New York: New York University Press, pp.113–119.
- Brown J (2009) Weight problems born of bad diet in pregnancy. *The Sydney Morning Herald*, 5 February, p.17.
- Campos P, Saguy A, Ernsberger P, et al. (2005) The epidemiology of overweight and obesity: Public health crisis or moral panic? *International Journal of Epidemiology* 35(1): 55–60.
- Cole T, Power C and Moore G (2008) Intergenerational obesity involves both the mother and the father. *American Journal of Clinical Nutrition* 87(5): 1535–1536.
- Connolly E (2008) Mum's diet shapes a child's future weight. *The Sunday Telegraph*, 27 January. Available at: <http://www.news.com.au/features/mums-diet-shapes-a-childs-future-weight/story-e6frfl49-1111115406021>.
- Cornes N (2006) Fat kids? Yes, mum's the word. *Sunday Mail*, 17 September, p.110.
- Davey Smith G, Steer C, Leary S, et al. (2007) Is there an intra-uterine influence on obesity? Evidence from parent-child associations in the avon longitudinal study of parents and children (ALSPAC). *Archives of Disease in Childhood* 92: 876–880.
- Douglas M (1966) *Purity and Danger: An Analysis of the Concepts of Pollution and Taboo*. London: Routledge & Kegan Paul.
- Dyck J (1995) *Manufacturing Babies and Public Consent: Debating the New Reproductive Technologies*. London: Macmillan.
- Ebbeling C, Pawlak D and Ludwig D (2002) Childhood obesity: Public-health crisis, common sense cure. *Lancet* 360(9331): 473–482.
- Epstein J (1995) The pregnant imagination, fetal rights, and women's bodies: A historical inquiry. *Yale Journal of Law & the Humanities* 7(139): 139–162.
- Fox M (2005) Fat mums set the trend for obese kids. *The Sunday Mail*, 30 January, p.29.
- Fox R, Nicolson P and Heffernan K (2009) Pregnancy police? Maternal bodies, surveillance and food. In: Jackson P (ed.) *Changing Families, Changing Food*. Basingstoke: Palgrave MacMillan, pp.57–74.
- Goodwin S and Huppertz K (eds) (2010) *The Good Mother: Contemporary Motherhoods in Australia*. Sydney: Sydney University Press.
- Hall L and Davis K (2009) Obese mums-to-be urged to diet. *The Sydney Morning Herald*, 30 March, p.3.
- Hawkins S, Cole T, Law C, et al. (2009) An ecological systems approach to examining risk factors for early childhood overweight: Findings from the UK millennium cohort study. *Journal of Epidemiology and Community Health* 63(2): 147–155.
- Hays S (1996) *The Cultural Contradictions of Motherhood*. New Haven, CT: Yale University Press.
- Huff J (2001) A 'horror of corpulence': Interrogating bantingism and mid-nineteenth-century fat-phobia. In: Brazier J and LeBesco K (eds) *Bodies out of Bounds: Fatness and Transgression*. Berkeley, CA: University of California Press, pp.39–59.

- Johnson S (2010) Discursive constructions of the pregnant body: Conforming to or resisting body ideals? *Feminism and Psychology* 20(2): 249–254.
- Keenan J and Stapleton H (2010) Bonny babies? Motherhood and nurturing in the age of obesity. *Health, Risk & Society* 12(4): 369–383.
- Kivimäki M, Lawlor D, Davey Smith G, et al. (2007) Substantial intergenerational increases in Body Mass Index are not explained by the Fetal Overnutrition Hypothesis: The cardiovascular risk in young Finns study. *American Journal of Clinical Nutrition* 86(5): 1509–1514.
- Kral J (2004) Preventing and treating obesity in girls and young women to curb the epidemic. *Obesity Research* 12(10): 1539–1546.
- Kukla R (2005) *Mass Hysteria: Medicine, Culture and Mother's Bodies*. Lanham, MD: Rowman & Littlefield.
- Kukla R (2008) Measuring mothering. *The International Journal of Feminist Approaches to Bioethics* 1(1): 67–90.
- La Coursiere D, Bloebaum L, Douncan J, et al. (2005) Population-based trends and correlates of maternal overweight and obesity, Utah 1991–2001. *American Journal of Obstetrics and Gynecology* 192(3): 832–839.
- Ladd-Taylor M and Umansky L (eds) (1998) *'Bad' Mothers*. New York: New York University Press.
- Lawlor D, Timpson N, Harbord R, et al. (2008) Exploring the developmental overnutrition hypothesis using parental-offspring associations and FTO as an instrumental variable. *Public Library of Science Medicine* 5(3): 1–10.
- Litt J (2000) *Medicalized Motherhood*. New Brunswick, NJ: Rutgers University Press.
- Longhurst R (1999) Pregnant bodies, public scrutiny: 'Giving' advice to pregnant women. In: Teather E (ed.) *Embodied Geographies: Spaces, Bodies and Rites of Passage*. London: Routledge, pp.78–90.
- Longhurst R (2008) *Maternities: Gender, Bodies and Space*. New York: Routledge.
- Lupton D (1996) *Food, the Body and the Self*. London: SAGE.
- Maher J (2001) The promiscuous placenta: Crossing over. In: Bashford A and Hooker C (eds) *Contagion: Historical and Cultural Studies*. London: Routledge, pp.201–216.
- Maher J, Fraser S and Wright J (2010) Framing the mother: Childhood obesity, maternal responsibility and care. *Journal of Gender Studies* 19(3): 233–247.
- Malik H (2007) *From Placenta to Lunchbox: Mothers, the Media and Fat Kids*. Unpublished Honours thesis. Bachelor of Physiotherapy, School of Health Sciences, University of South Australia.
- McMillen C, MacLaughlin M, Muhlhausler B, et al. (2008) Developmental origins of health and disease: The role of periconceptional and fetal nutrition. *Basic and Clinical Pharmacology and Toxicology* 102(2): 82–89.
- McNaughton D (2011) From the womb to the tomb: Obesity and maternal responsibility. *Critical Public Health* 21(2): 179–190.
- Medew J (2009) Child neglect linked to feeding. *The Sydney Morning Herald*, 27 January, p.3.
- Moffat T (2010) The childhood obesity epidemic. *Medical Anthropology Quarterly* 24(1): 1–21.
- Monaghan L, Holland R and Pritchard G (2010) Obesity epidemic entrepreneurs: Types, practices and interests. *Body & Society* 16(2): 37–71.
- Moore V and Davies M (2008) Early life influences on later health: The role of nutrition. *Asia Pacific Journal of Clinical Nutrition* 10(2): 113–117.
- Murray S (2005) (Un/be)coming out? Rethinking fat politics. *Social Semiotics* 15(2): 153–163.

- Murray S (2008) Pathologising 'fatness': Medical authority and popular culture. *Sociology of Sport Journal* 25(1): 7–21.
- Nerlich B (2009) The post-antibiotic apocalypse and the war on superbugs: Catastrophe discourse in microbiology, its rhetorical form and political function. *Public Understanding of Science* 18(5): 574–590.
- Oken E and Gillman M (2003) Fetal origins of obesity. *Obesity Research* 11(4): 496–506.
- Orbach S (2009) *Bodies*. London: Profile.
- Parker C (2009) Where have all the 'good' mothers gone? Risk, responsibility and reproductive rights, Paper presented to the 15th International Critical & Feminist Perspectives in Health and Social Justice Conference, Auckland University of Technology, Auckland, 17–19 April 2009.
- Possamai-Inesedy A (2006) Confining risk: Choice and responsibility in childbirth in a risk society. *Health Sociology Review* 15(4): 406–414.
- Paul A (2010) How the first nine months shape the rest of your life. *Time Magazine*, 22 September. Available at: <http://www.time.com/time/health/article/0,8599,2020815,00.html>.
- Petersen A, Anderson A, Allan S, et al. (2009) Opening the black box: Scientists views on the role of the news media in the nanotechnology debate. *Public Understanding of Science* 18(5): 512–530.
- Ruddick S (2007) At the horizons of the subject: Neo-liberalism, neo-conservatism and the rights of the child, Part One. *Gender, Place and Culture* 14(5): 513–527.
- Saguy A and Almeling R (2008) Fat in the fire? Science, the news media, and the 'obesity epidemic'. *Sociological Forum* 23(1): 53–83.
- ScienceDaily (2007) Eating junk food while pregnant and breastfeeding may lead to obese offspring. Available at: <http://www.sciencedaily.com/releases/2007/08/070814212154.htm> (accessed 16 June, 2011).
- Shepherd T (2009) Overweight mums putting newborns at greater risk. *The Advertiser*, 16 March, p.3.
- Skeggs B (2005) The making of class through visualising moral subject formation. *Sociology* 39(5): 965–982.
- Singh I (2004) Doing their jobs: Mothering with Ritalin in a culture of mother-blame. *Social Science & Medicine* 59(6): 1193–1205.
- Steele S (1999) A large legacy – overweight children may not have to look too far to find the reason – it could all be mum's fault. *Sunday Mail*, 7 November, p.22.
- Stewart F (2009) Mother's smoking gun. *The Advertiser*, 15 March, p.11.
- Susser M and Levin B (1999) Ordeals for the Fetal Programming Hypothesis. *British Medical Journal* 318: 885–886.
- The Sydney Morning Herald (2006) Gulp...You are what Grandma ate. 18 November, p.34.
- Taor A (2009) Breastfed children least likely to be abused by mothers. *The Australian*, 31 January, p.5.
- Unnithan-Kumar M (2011) Corporeality and reproduction: Understanding fatness through the diverse experiences of motherhood, consumption and social regulation. In: Unnithan-Kumar M and Tremane S (eds) *Fatness and the Maternal Body: Women's Experiences of Corporeality and the Shaping of Social Policy*. Oxford: Berghahn Books.
- Ussher J (2006) *Managing the Monstrous Feminine: Regulating the Reproductive Body*. London and New York: Routledge.

- Warin M, Moore V, Zivkovic T, et al. (2011) Telescoping the origins of obesity to women's bodies: How gender inequalities are being squeezed out of Barker's Hypothesis. *Annals of Human Biology* (special edition) 38(4): 453–460.
- Wells J (2010) *The Evolutionary Biology of Human Body Fatness: Thrift and Control*. Cambridge Studies in Biological and Evolutionary Anthropology: Cambridge University Press.
- Wright J and Harwood V (2009) *Biopolitics and the 'Obesity Epidemic': Governing Bodies*. New York: Routledge.
- Zivkovic T, Warin M, Davies M, et al. (2010) In the name of the child: The gendered politics of childhood obesity. *Journal of Sociology* 46(4): 375–392.

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