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What to do when you can’t (afford to) collect your own data?: A test case using the Longitudinal Study of Australian Children to investigate the influence of parental context on media use and obesity

Leonie Rutherford, Deakin University, Geelong, Vic

Judith Brown, University of New England, NSW

Helen Skouteris, Deakin University, Burwood, Vic

Michael Bittman, University of New England, NSW

Abstract
The dramatic rise in childhood obesity prevalence in the last two decades has prompted concern about the risk factors that may precipitate or maintain weight gain, or both, in early childhood. Media use has long been implicated in policy debates in Australia, particularly around limits to advertising. However the Australian research funding ecology and dominant paradigms in Australian communication and media studies have resulted in a lack of independent, nationally representative studies upon which to base advice. Australian researchers often can’t afford to collect the kind of data they would like in order to intervene productively as policy actors. As a test case for innovative ways round this dilemma, this paper mobilises secondary data analysis methodologies to explore potential influences of parenting on children’s media use and their weight status.

The research reported here uses data from the first three waves of the Longitudinal Study of Australian Children. Results from a path model suggest that children of mothers who were less consistent in the way in which they enforce their rules were more likely to adopt unhealthy lifestyle behaviours, such as sedentary behaviour and consuming unhealthy snacks. Of the lifestyle behaviours considered, time spent watching television or DVDs was the only predictor of child weight status in late childhood. These results suggest a clear pathway linking consistent parenting and other parental practices, children’s lifestyle behaviours and weight status.

In a recent issue of Media International Australia, several leading media and communication scholars offered analyses of the development of Australian and New Zealand communication research compared to international research in the field. Terry Flew offered a model of institutional differentiation through which to understand the Australian and New Zealand trajectory of research, including Australia’s political culture, its dominant intellectual traditions and levels and types of research funding (Flew, 2010, pp. 5–12). Along with others in the issue, Flew highlighted the genesis of media studies in Australian universities during the rise of cultural studies in the 1980s, together with the influence of the cultural industries paradigm in the 1990s.
As a researcher specialising in children’s and youth media from an interdisciplinary perspective, the first author of this paper has found the comparative divide between Australian (UK) and American intellectual traditions to be quite stark. Studies of children and media from the USA have been dominated by communication science methodologies (largely due to the impact of the Surgeon General’s Department on research funding and research agenda setting). In the UK and Australia, such ‘hard’ communication science research is treated with some suspicion, perceived as having a tendency to mistake correlations between media use and health problems as evidence for direct effects. Media studies in these countries prefers qualitative methodologies to frame a nuanced picture of the role of media in everyday life, as a ‘domesticated’ practice, while the cultural studies paradigm prioritises the playful and agential social deployment of participatory and other media. 

Cross-cultural differences can also be partially explained by government research funding priorities and data control issues. In the US, where large government collected datasets have been publicly available in their elemental form for decades, it is common for sociology PhDs to be trained in secondary data analysis of large nationally representative studies. In Australia, where census and other ABS data has been restricted, doctoral training has more commonly involved candidates collecting their own data. Due to resource considerations this has inevitably meant small datasets and a tendency towards qualitative studies of small samples. 

In Australia, government bodies are the main sources of funding for nationally representative data collection about children’s media use. The Australian Research Council, unlike the more generous schemes available in the UK and Europe, rarely funds such expensive projects. The Australian Media and Communications Authority (ACMA), with its statutory brief to undertake community research has been a major, though not regular, commissioner of studies on children, families and media use. Its two major studies, a decade apart (Cuppit and Stockbridge, 1996; ACMA, 2007), utilised a cross-sectional design and provided descriptive statistical analysis. Their instruments were designed to address the regulator’s concerns, particularly parental concerns and management strategies, and their findings do not facilitate longitudinal comparisons of variables concerned with media use. Prospective research (i.e. ‘going forward’: the kind of study that is designed to help track potential factors that affect policy – relevant issues for government in order to suggest intervention strategies) is costly and vary rare in the Australian research funding ecology.

A major exception – The Longitudinal Study of Australian Children (LSAC) – was put into planning in the late 1990s by the Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA): the department charged with administering the majority of welfare benefits. FaHCSIA has a keen interest in research that helps it identify and intervene to deflect conditions that negatively impact on child and family well-being. The LSAC is a broad-ranging developmental study using a range of survey instruments, fieldwork, diaries, and direct health, psychosocial and educational assessments that has been conservatively costed at around $30 million AUD to date, and this will increase as the study follows its two cohorts of children every two years until they are eighteen.

Four waves of data have thus far been made available. Researchers are now able to scrutinise the maturation of a large sample of Australian children from diverse social strata and geographical locations at a point in history in which digital media practices are being seen to radically transform social life. However, the LSAC is an ‘omnibus’ survey, thus not designed
specifically with media studies in mind. Though it does contain media and family practice measures and boasts a light time diary that is able to track daily routines, a researcher using this dataset is faced with inevitable problems that arise from not being able to choose the measures best suited to investigate a particular applied question to policy relevant social issues.

The paper that follows is an example of modelling that hoped to resolve some questions that have arisen in recent policy debates about children and obesity, particularly in (1) the revision of the Children’s Television Standards (2007–2009) and (2) the food advertising ‘watershed’ recommendations outlined in the National Taskforce on Preventative Health. These policy contexts have been discussed in detail elsewhere (Rutherford et al., 2011). These questions are, in brief: is it poor parental practices, excessive snacking, or the effects of sedentary lifestyles that are primarily responsible for the association consistently found between time spent with screen media—particularly television—and overweight?. One US study (Zimmerman and Bell, 2010) suggestively found that BMI was associated with commercial television viewing. However, on a much smaller scale, recent Australian research failed to confirm this finding (Cox et al., 2012a). Is this the result of difference in television systems, with much more public service media available in Australia particularly for preschool parents and children? By using the LSAC’s robust and representative sample, we hoped to unpack this conundrum. Furthermore, by using a path analysis, able to model indirect influences between variables, we hoped to identify some of the pathways that explain why, for example, extent of television viewing and weight of a child’s mother are consistently associated with increased risk of obesity and overweight. However, as our discussion concludes, ‘not being able to collect your own data’ imposed limitations on the results of the study.

The field of child obesity research

The field of child obesity research concerns itself with risk factors, among which television (to a lesser degree other screen time), nutritional practices and other factors to do with parenting and the home environment loom large. While there is evidence that supports a role of non-modifiable genetic factors in energy storage patterns (Rankinen et al., 2006), it is generally agreed that these are insufficient to explain the dramatic increase in childhood overweight in recent decades. Epidemiologists now believe that the ‘co-morbidities’ associated with obesity (e.g. diabetes, cardiovascular disease, joint pain) are non-communicable ‘lifestyle’ diseases typical of affluent societies of the 21st century (McMichael, 1999).

The most influential context of learning in a pre-schooler’s life is their family of origin and many of the risk factors for overweight and obesity in early childhood are likely to have roots within the family context. Based on their own lifestyles, beliefs and approach to parenting, parents create a home environment that necessarily influences their children’s lifestyle behaviours. Some of these behaviours—particularly television viewing, lack of vigorous exercise, and snacking on energy-dense foods—have long been implicated in child overweight and obesity. Hence, research that systematically investigates the pathways through which parenting affects the interplay of obesity risk factors over time has the potential to contribute significantly to effective prevention strategies during the early childhood years.

Few studies have examined the influence of parenting practices on a range of child behaviours. To date, the majority of studies examining the associations between parenting and child weight status have focused on diet specific parenting practices; however, the role of parents in
influencing children’s hours of television viewing is, typically, not the focus of these studies. Several studies have indicated that lifestyle behaviours cluster together (eg Brown, et al., 2010). It is commonly argued that television viewing may displace physical activity or is associated with concurrent snacking and increased total energy intake resulting from exposure to advertising (Cox et al, 2012b; Jordon and Robinson, 2008). Inconsistent findings about the links between food intake, physical activity and childhood obesity may possibly be explained by the fact that food intake and physical activity can be measured in a variety of ways. There is, therefore, a clear need for longitudinal data analysis that systematically and rigorously models the interplay between parenting and the whole cluster of obesogenic child lifestyle behaviours.

Parenting practices and children’s lifestyle behaviours

Parents impact on children’s lifestyle behaviours through both the physical environment they provide (e.g., access to nutritious and non-nutritious foods, the audio-visual and digital technologies in the home, sporting equipment available, etc) and the social-emotional environment they develop in their relationship with the child. Parenting has a number of dimensions that can be analytically separated. Since parents are also responsible for their children’s socialisation and their safety, parents have the difficult task of setting boundaries for their children’s acceptable behaviours and maintaining a affirmative relationship with their children. Following the influential work of Diana Baumrind (1973), the balance between control by regulation and responsiveness to the child’s needs can leads to three distinctly different styles of parenting – permissive, authoritarian and authoritative.

Permissive parents are highly responsive, affirming all their child’s impulses. However, they make few demands for the child to behave responsibly. At the opposite extreme, authoritarian parents attempt to regulate control the child’s behaviour according to some pre-given, externally legitimated standard. Authoritarian parents value obedience over autonomy. They favour punitive, coercive measures to curb the child’s impulses when this lead to conflict with what the parents’ regard as correct conduct. (Baumrind, 1973). The authoritative parenting style is distinguished by responsiveness to the child’s needs without being indulgent. The authoritative parent sets consistent boundaries without being rigid, shares reasons for parental decision with the child and solicits the child’s objections when they refuse to conform. While the authoritative parent affirms the child’s present qualities the also set standards for future behaviour.

Support for authoritative parenting as an important mediator which reduces more direct influences on the risk of children exceeding a healthy weight, such as consumption of energy dense, low nutrient foods and lack of moderate to vigorous activity, can be found in previous research. Rules governing one aspect of children’s lives may be indicative of rules and attitudes covering multiple lifestyle domains (Warren et al, 2002). When parents consistently apply rules they not only set limits on children’s behaviours (such as time spent watching television) but also provide an environment in which children can learn to regulate their own behaviours.

Mothers’ weight status and child weight status

Finally, parental weight and most especially maternal weight, is a consistently strong predictor of children’s weight (For example, Griffiths et al, 2010). Previous studies have shown that children of mothers who are overweight spend more time watching television (Brown, et al., 2010; Francis et al 2003). The question of whether parental practices which specifically impact upon
the child add additional risks over those that are associated maternal weight is one our research hoped to clarify.

**Conceptual model**

Following lines of reasoning suggested by the research on parenting surveyed above, we proposed that consistent (authoritative) parenting, set boundaries to children’s access to media and the duration of their media, which influence the child’s lifestyle behaviour, in particular physical activity and diet, which increase the likelihood of the child maintaining a healthy weight. Conversely inconsistent parenting does not encourage children to self-regulate media use, leading to a preponderance of sedentary activities and excessive intake of calories, resulting in a greater risk of becoming overweight or obese, as illustrated in Figure 1 below.

![Conceptual Model Diagram](image)

Using data from the first three waves of LSAC, we investigated the following pathway: whether mothers’ consistent parenting practices at Wave 1 (when children were in their preschool period, aged 4–5 years):

a) predicted that parents would develop rules about their children access to media and the time of children spent in television use; at Wave 2, when children were 6–7 years;

b) shaped children’s actual television use and associated lifestyle behaviours—such as snacking and physical activity— at age 6–7 years; and

c) that ultimately the pathway from consistent parenting, through rules about television consumption, to the cluster of lifestyle activities (actual time spent in using television, low physical activity and consumption of energy dense-low nutrition snacks) would affect the risk of overweight or obesity at age 8–9 years.

**Hypotheses**

On the basis of prior research, we hypothesised that:

1. Parental consistency and rules about the to the quantity of television that children are allowed to watch would be predictive of the amount of time that children spent watching television;
2. Television viewing, would be associated with less moderate to vigorous physical exercise and higher consumption of energy dense-poor nutrition snacks rather than dietary.

3. Since television use, patterns of physical activities and nutrition practices are clustered, the statistical analysis of the pathways to overweight or obesity may work primarily through the best measured aspect of lifestyle, namely the quantity of time spent watching television.

Methods – Sample
This paper uses confidential data from the first three waves of LSAC. Detailed information on study design and the sample is available elsewhere (Soloff et al, 2006). Briefly, LSAC is a national longitudinal study which follows two Australian cohorts born in 1999 (K cohort) and 2003 (B cohort) at two year intervals starting in 2004. The current study uses data from the K cohort, collected at age 4–5 years in 2004 (Wave 1, n = 4983; 52% boys), 6–7 years in 2006 (Wave 2, n = 4464; 89.6% retention) and 8–9 years in 2008 (Wave 3; n = 4331, 97% retention). Data were obtained during face-to-face interviews, questionnaires and diaries of the child’s time use completed by the child’s mother, and direct measurement of the child’s weight and height.

Sample representativeness at Wave 1 was established by comparison with the Australian population using 2001 Census data. There were few differences across a wide range of demographic measures (Soloff et al, 2006: Misson and Sipthorp, 2009).

Methods – Measures
Child Weight Status (Wave 3)
Children’s weight was measured in light clothing to the nearest 50g using digital scales (Salter Australia, Code 79985), and height to the nearest 0.1cm using a portable rigid stadiometer. Children were classified as non-overweight versus overweight or obese according to the International Obesity Taskforce age– and sex-specific criteria (Cole et al, 2000) for body mass index (BMI) (kg/m2).

Lifestyle behaviours (Wave 2) (a) Television viewing and moderate to vigorous exercise
Time spent viewing television and in physical activity was assessed using a ‘light’ time-use diary. Mothers completed two 24-hour diaries, for a randomly selected weekday and weekend day. Child activities while outside the care of the parent were not recorded. Television viewing time was represented by the category of the child ‘watching TV, video, DVD or movie’. A synthetic average daily estimate for television viewing and physical activity was calculated by summing the total weekday estimate multiplied by five, with the total weekend day estimate multiplied by two, and dividing the sum by seven.

Lifestyle behaviours (Wave 2) (b) Snacking
Mothers reported whether, in the last 24 hours, the child had consumed: ‘sweet drinks’, ‘potato chips or savoury snacks’, ‘biscuits, donuts, cake, pie or chocolate’. Responses were coded for each snack food group as 0 = ‘not at all’, 1 = ‘once’, 2 = ‘more than once’. High consumption of a range of snacks was computed by summing the number of these foods consumed ‘more than once’ in the last 24 hours, giving a snacking score ranging from 0 (consumption of each food was ‘not at all’ or ‘once’) to 3 (consumption was ‘more than once’, for all three snack foods).

Parental Practices (Wave 1) Consistent parenting
This scale comprised of five items from the from the National Longitudinal Survey of Children and...
Youth (Statistics Canada, 1995). It assessed the degree to which parents follow through with discipline and requests. Responses were on five-point likert scales ranging from 1 (never or almost never) to 5 (all of the time). Items were averaged to obtain a summary score (Cronbach’s \( \alpha = 0.7 \)).

**Parental Practices (Wave 2) Television rules**

Parents were asked, ‘are there rules about how many hours child study may watch television each week?’ (0=no, 1=yes)

**Parental Practices (Wave 2) Media access**

Parents were asked whether the child had a television in the bedroom or a computer in the home (0=no, 1=yes).

**Maternal weight status (Wave 1)**

Maternal BMI status was classified as non-overweight (<25kg/m2), overweight or obese (≥25 kg/m2) based on mothers’ self-reported height and weight (World Health Organisation, 1998).

**Control variables (Wave 1)**

The control variables, the child’s gender, mother’s age, years of education and weight status and equivalised household income (see below) were based on the mothers’ reports at Wave 1. As the diaries only recorded time in parental care, the estimated average number of hours per week in non-parental care was also added as a covariate in paths where diary data (e.g. time spent television viewing) was used as an outcome variable.

Household income was measured in bands for gross income. Using band midpoints, gross income was equivalised by dividing the estimate by the square root of the number of people in the household. Equivalised household incomes were then categorised into three groups based on quintiles: low income was the bottom quintile; high income was the top quintile; and middle income was the remaining three quintiles. Note: The ‘midpoint’ for the top category was conservatively estimated as the equivalent increment from the lowest value as applied for other income bands; AUD$5,200 above the lowest value.

**Data Analysis**

The sample was restricted to participants from single female or couple households with two days of diary data. After application of conservative data cleaning strategies and removal of diaries deemed to be of poor quality, the final sample was 2062. Differences between the full wave and analytic samples were small: less than one year for mothers’ age and education and less than one hour for mothers’ hours of work. Average income in the analytic samples was around AUD$3000 more than in the full samples. Sample weights were applied to correct for Wave 3 biases in the sample design and non-response of potential respondents, and for attrition biases across the waves (Misson and Sipthorp, 2009).

Missing data rates were low for all variables collected via interview (0–1%), with the exception of household income and mother’s body mass index (BMI). Using all other Wave 1 control variables and the additional variable of number of siblings in the household, multiple imputation was applied to the five Wave 1 variables with missing data: mother’s consistent parenting, age and years of education, mothers BMI and equivalised household income. Imputation was applied to
the full Wave 1 sample (n=4941; 42 cases excluded due to insufficient maternal data) using SAS version 9.

To test our conceptual model we fitted a path model using MPLUS version 5.2. The model examined the associations between parental practices (Wave 1 and Wave 2), children’s lifestyle behaviours (Wave 2) and child’s weight status (Wave 3). Two supplementary analyses were also performed.

Additionally, while not a part of our conceptual model, we performed two supplementary analyses. The first tested whether there was a direct association between parenting practices (child aged 4–5 and 6–7) and child weight status (child aged 8–9). Based on the literature review we did not expect that there would be such an association. Second, we performed a sensitivity analysis to consider whether the model differed by gender.

# Results

## Sample characteristics

Demographic characteristics, parental practices and children’s lifestyle behaviours are summarised in Table 1. At Wave 3, 22% of the children were classified as overweight or obese. Around 40% of mothers were overweight or obese at Wave 1. Overall, children engaged in physical activity or watched television for an average of 90 minutes or used a computer or played electronic games for an average of 20 minutes per day at Wave 2 (age 6–7). Around a third of the children (36%) consumed two or more serves of any of the three snack foods considered (chips, biscuits or soft drinks). On average mothers rated themselves as consistently enforcing rules most of the time. When the children were aged 6–7 (Wave 2), around 50% of parents reported that they had rules regarding the quantity of television that their children were allowed to watch, while 15% of children had a television in their bedroom.

### Table 1: Characteristics of sample

<table>
<thead>
<tr>
<th>Outcome Variable (Wave 3)</th>
<th>Child weight status: Overweight or obese</th>
<th>22.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parental Practices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consistent parenting (Wave 1)</td>
<td></td>
<td>Mean 4.1 Standard Error 0.2</td>
</tr>
<tr>
<td>Rules about the quantity of television</td>
<td></td>
<td>51.8%</td>
</tr>
<tr>
<td>Television in bedroom</td>
<td></td>
<td>15.0%</td>
</tr>
<tr>
<td>Computer in the home</td>
<td></td>
<td>91.5%</td>
</tr>
<tr>
<td><strong>Lifestyle Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Television viewing (hours/day)</td>
<td></td>
<td>Mean 1.5 Standard Error 0.0</td>
</tr>
<tr>
<td>Moderate to vigorous exercise (hours/day)</td>
<td></td>
<td>Mean 1.6 Standard Error 0.0</td>
</tr>
<tr>
<td>Computing or games (hours/day)</td>
<td></td>
<td>Mean 0.3 Standard Error 0.0</td>
</tr>
<tr>
<td>Snacks (Count of consumption of 2+ snacks)</td>
<td></td>
<td>Mean 0.4 Standard Error 0.0</td>
</tr>
<tr>
<td><strong>Control Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td></td>
<td>51.4%</td>
</tr>
<tr>
<td>Mother’s age (years)</td>
<td></td>
<td>Mean 35.4 Standard Error 0.1</td>
</tr>
<tr>
<td>Mother’s education (years)</td>
<td></td>
<td>Mean 14.6 Standard Error 0.1</td>
</tr>
<tr>
<td>Maternal weight status: Overweight or obese</td>
<td></td>
<td>44.5%</td>
</tr>
<tr>
<td>Equivalised household income – Low</td>
<td></td>
<td>22.5%</td>
</tr>
</tbody>
</table>
Equivalised household income – Middle 59.3%
Equivalised household income – High 18.2%
Time spent in out-of-family care or at school Mean 2.2  Standard Error 0.1

**Path Model**
A path model was fitted to test our conceptual model. The final model showed good fit. RMSEA=0.015 and CFI=0.973. The model explained 11% of variance.

![Path model diagram]

Figure 2. Path model showing longitudinal associations between parental practices, children’s lifestyle behaviours and child weight status

**Associations between maternal consistent parenting and other parental practices and lifestyle behaviours**
Associations between consistent parenting and other parental practices (rules regarding the quantity of television viewing, television in bedroom, computer in home) and children’s lifestyle behaviours (television viewing, computing, snacking and exercise) were examined while controlling for a range of demographic variables (See Figure 2). Parents who were more consistent at Wave 1 (child age 4–5) were less likely to allow their children to have a television in their bedroom, and their children were less likely to snack and spent less time watching television or using a computer or playing video games two years later (p-value <0.05).

**Associations between rules about television viewing and access to media and lifestyle behaviours**
Consistent with expectations, rules regarding the amount of time that children were allowed to watch television and having a television in the bedroom, impacted on time spent watching
television (p-value<0.001). The presence or absence of these parental practices was also associated with snacking behaviours and time spent using a computer or playing electronic games (p-value <0.05). Having rules about the quantity of television decreased television viewing and computing or game time by an average of seven and two minutes, respectively. Having a television in the bedroom increased television viewing time by an average of eighteen minutes per day. Similarly, having a computer in the home increased time spent using a computer or playing electronic games by ten minutes per day (p-value<0.01).

**Association between maternal weight and lifestyle behaviours**
Prospective associations between mother’s weight status (Wave 1) and children’s lifestyle behaviours (Wave 2) were examined (see Figure 2). There was a small positive association between maternal weight and children’s television viewing. Children of mothers who were overweight or obese, watched an average five minutes more television compared to their peers with non-overweight or obese mothers.

**Associations between lifestyle behaviours and child weight status**
After controlling for a variety of demographic variables (including maternal weight), children who watched more television (child aged 6–7) were more likely to be overweight or obese two years later when aged 8–9 years (OR=1.10, CI=1.03, 1.17). Children who spent more time watching television (child aged 6–7) spent less time in physical activity, more time using a computer and were more likely to consume snack foods (p-value <0.05). For every extra hour of television viewing, children spent four minutes less in active pursuits but three minutes more using a computer. Children who spent more time using a computer or playing computer games were also more likely to consume snack foods (p-value< 0.001).

**Supplementary analyses**
The first supplementary analysis tested whether the parenting practices (maternal consistent parenting, rules about the quantity of television children were allowed to watch and access to media) were directly associated with child weight status. Results indicated that none of the parental practices used in this study were directly associated with child weight status (p-value>0.05). The second supplementary analysis was undertaken to explore the impact of child gender on the path model. Two of the pathways were found to have a significant interaction with gender. Results indicated that the impact of maternal consistent parenting on having rules about the quantity of time that the child was allowed to watch television was greater for boys than for girls (p-value<0.05). Also the impact of maternal weight status on the time that children spent watching television was greater for girls than for boys (p-value<0.05).

**Note**
Unstandardised betas are shown as multiple imputation was used. * p-value<0.05, ** p-value<0.01, *** p-value<0.001

**Discussion**
This study shows that, regardless of amount of time spent with media, or the content accessed (whether commercial media, and therefore more likely to embed advertising for energy dense snack foods, or public service media), parental context and parenting styles are an important predictor of child weight status. This association holds true whether the family of origin is of high or lower socio-economic status, and regardless of the gender of the child or the mother’s weight status. Consistent parenting was both directly and indirectly associated with less time spent in
sedentary activities and a lower consumption of unhealthy snacks. However, we were not able to provide evidence to show the mechanism by which television mediates child obesity. Since it seems implausible that simply using media directly causes obesity, we hoped to show a clear association between time spent with media and either decreased exercise or increased snacking. Being unable to influence the selection of measures for these variables, our path was not able to directly implicate either. While research from the US (a more commercial media ecology) found associations between time spent accessing commercial media and overweight children (Zimmerman and Bell, 2010), Australian research – though with a much smaller and less representative dataset – could not reproduce this policy-relevant finding (Cox et al., 2012a).

As expected, children of mothers who were overweight or obese when the child was 4–5 years were also more likely to be overweight or obese four years later. The degree to which this represents unmeasured behaviours (eg household food cultures) or genetic disposition remains unclear. Maternal weight was also shown to impact upon child weight status through the amount of time spent watching television, although it appears that finding applies more to girls than to boys. Consistent with our expectations, we found that children’s lifestyle behaviours cluster together. The fact that increased television viewing was associated with lower levels of physical activity possibly indicates that television viewing may displace physical activity in some children, though we cannot show a direct link in our model between sedentary lifestyles and overweight.

Television viewing was again found to play a central role in the obesity story. While this is not evidence for causality, it does indicate that children who are overweight or obese do have long term lifestyle patterns that will maintain a higher weight status. Taken together, the results from our study suggest that interventions aimed at parental knowledge about conditions of children’s access to media, and its placement in the household, together with programs to improve parental consistency in monitoring children’s media use, particularly television, may be of benefit.

However, it is important to note that there are potential limitations. Large scale studies, such as the Longitudinal Study of Australian Children, frequently sacrifice measurement depth for breadth (Hofferth, 2005), as illustrated by the rather blunt measure of snack food consumption. As flagged above, our snacking measure does not allow us to directly measure the amount and type of food consumed while children are using the media nor does it allow us to identify potential associations between television content (or duration) and over-consumption of unhealthy foods. Data were not collected on children’s lifestyle behaviours when not in parent care, with a consequent likelihood that some measures are under-estimated. Finally, our model is unidirectional and only tests the associations from parents to children and not from children (such as temperament or weight status) to their parents.

It is also important to note that, no matter how obvious the association is between lifestyle behaviours and childhood obesity, the reported associations were not large. In addition to the limitations in the measures outlined above, this suggests that the rise in childhood obesity does not result from a small number of lifestyle variables set within the family context but is the product of the total influence of the wider social and economic environment (Dixon and Broom, 2007).
Conclusion
While not purposively designed for the study of media, the LSAC study allows researchers to test models of developmental influence that have the potential to contribute to policy discussions around children’s media use and health. While the current climate of funding for large scale national social research being remains bleak, secondary data analysis projects can go some way to working around the inability to collect one’s own data.

Our test case model was able to show that children’s lifestyles pertinent to weight maintenance not only cluster together, but are also shaped by the rules that parents set – and enforce – and the physical environment they provide, here represented by electronic media. Consistent with previous literature, we see that media continues to plays a central role in the cluster of behaviours that contribute to this increasingly important public health issue.

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