'Family environmental influences on children's eating behaviour and appetite'

Dr Faye Powell
University of Bedfordshire
Age over time

The prevalence of obesity has increased since 2014/15 in both age groups.

In reception it increased to 9.3% from 9.1%, and in year 6 to 19.8% from 19.1%.

In reception obesity prevalence was lower than in 2006/07.

In year 6 obesity prevalence was higher than in 2006/071.

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**Source:** NCMP 2015/16, table 1b, NHS Digital

1. It is likely that year 6 obesity prevalence in the first years of the NCMP (2008/07 to 2008/09) were underestimates due to low participation. This, and the impact of other improvements in data quality, should be considered when making comparisons over time. More details in annex B.
Health Risks

- Type 2 diabetes
  - Now diagnosed as young as 7 years old
  - Up to 17 yrs – 95% overweight or obese (Haines et al., 2007)

- CVD risk
  - x4 risk of hypertension in adulthood (Watson et al., 2013)

- Psychosocial risk – self esteem, QoL, ED’s, teasing

- Musculoskeletal problems (Deere et al., 2012)
Why?

GENETICS?
Does this explain the increased global prevalence of obesity?
WHY?

ENVIRONMENT?

Impact of the obesogenic environment
Why do some individuals seem to more susceptible to the obesogenic environment? 

Is this due to ID’s in appetitive traits?
OVERWEIGHT & APPETITIVE TRAITS

- Satiety responsiveness
- Food responsiveness
  - External eating
  - Emotional eating
  - Eating speed
  - Enjoyment in food
  - EAH paradigm (Fisher and Birch, 1999)

- Food fussiness
  - Links with low dietary variety

Behavioural Susceptibility Theory
(Carnell & Wardle, 2008)
Are there any modifiable risk/protective factors within the home environment?
Impact of the Feeding Environment

- Parental choices within the immediate home environment are likely to influence children’s emerging ability to self-regulate their energy intakes.

**TYPE**

Palatability, energy density
**Appetite Regulation & Energy Density**

= the amount of energy (or calories) per gram of food.

- **Effects:**
  - Satiation and satiety (e.g., Kral, Roe and Rolls, 2004)
  - Energy intake (e.g., Bell and Rolls, 2001).
APPETITE REGULATION & ENERGY DENSITY
APPETITE REGULATION & ENERGY DENSITY

Leahy, Birch and Rolls (2008)
- ED of M&C was reduced by 30%
- 2-5 year olds consumed 25% fewer calories.

Fisher, Liu, Birch and Rolls (2007)
- ED of M&C increased by 40%
- 5-6 year olds energy intake increased by 33%

Energy density of a meal may affect children’s ability to recognize internal feelings of satiety and satiation, therefore promoting the risk of overconsumption.
**Impact of the Feeding Environment**

- Parental choices within the immediate home environment are likely to influence children’s emerging ability to self-regulate their energy intakes.

**Amount**

*Developmental shift in susceptibility to portion size*
APPETITE REGULATION & PORTION SIZE

Rolls et al., (2000)
- 60% increase in energy intake between large and small portion conditions (77g vs 123g) in 4-5 year olds
- No effect of portion size in 2-3 year old children.

Developmental shift in susceptibility to portion size

Innate ability to self-regulate energy intake, driven primarily by physiological responses to hunger/satiety cues

Eating is no longer depletion driven but influenced more by a variety of environmental factors
Impact of the Feeding Environment

- Parental choices within the immediate home environment are likely to influence children’s emerging ability to self-regulate their energy intakes.

Frequency

Snacking
Is it just parental choices about the type, volume and frequency of eating episodes that are important?
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- Social context?
- Parent-child interactions around food; feeding practices, mealtime structure & dynamic
- Caregivers own eating behaviour and attitudes
**Parental Feeding Practices**

“the specific strategies that parents use in an attempt to maintain or modify their child’s eating style and diet”

(Ventura & Birch, 2008)

**Pressure to eat**

= pressuring the child to consume more or certain foods at meals

Associated with:

- ↑ Fussy eating & lower fruit & veg intake (Galloway et al., 2005)
- Disliked foods tracked back to childhood (Batsell et al., 2002)
- Overweight & consumption of higher fat foods

- Issue of cause and effect

- Who should decide upon portion size?

(Powell et al., 2016)
Restriction

= Parents’ attempts to control their child’s eating by restricting access to foods, including the type and amount of food

- Most often attributed to higher risk for overweight (Birch et al., 2003; Faith et al., 2004)
- Also disinhibition, poor appetite regulation & greater preference for restricted food
- Ogden 2005: Overt vs covert
Availability & Exposure...

- **Availability within also the home:**
  - Adolescents report most influential factor in their food choices and preferences (Story, Neumark-Sztainer & French, 2002)
  - Powell et al., (in prep). Predictors food fussiness over time.
    - Making more healthy foods available in the home
    - Encouraging balanced and varied food intake

**Familiarity**

- **Exposure**
  - How frequently a child is offered a particular food item
    - 15 exposures needed (Wardle, 2003/2005)
    - Age dependent; younger children require fewer exposures
  - Duration and quality of each experience important
    - How easy is this for parent?
Involvement.....

Involving children in food related activities; planning & preparation

Heim et al (2011)

- 8-11 years garden-based nutrition education programme
- ‘seed to table’ approach involving fruit and vegetable preparation and taste tests over 12 weeks
- significant increases in fruit and vegetable intake and preference post intervention
FEEDING FOR EMOTION REGULATION

Parents use food in response to external factors rather than in response to hunger and satiety.

Chocolate makes me happy.
Feeding for emotion regulation

- If food is used for comfort a child may develop a pattern of responding to emotional arousal with food intake.

Blissett, Haycraft & Farrow (2010)
- Lab based study which found
- SR of maternal use of food to regulate emotions predicted child consumption of cookies in the absence of hunger and in the presence of negative emotion.

Powell et al., (2011)
- Child contribution: Temperament
- Feeding for emotion regulation associated increased food responsiveness and emotional over-eating in child

- Just parents?

Farrow (2014)
**Modelling**

- Bandura (1977) SLT:
  - Children learn through observation or behavioural modelling
  - Social influence effects food preferences

- Family Mealtimes
  - Frequency:
    - Associated with consumption of healthier foods & decreased risk of disordered eating (Neumark-Sztainer et al., 2007)
  - Mealtime structure & Dynamic (Powell et al., 2016 & in prep):
    - Eating together that is important but also eating the same food
    - Positive reinforcement and vocalisations
MODELLING

- Not just for parents!
- Social contexts includes caregivers, siblings, peers, teachers, cartoons
- Person being copied important:
  - Mothers vs strangers (Harper & Sanders, 1975)
  - Older children better than younger (Birch, 1980)
  - Superheroes best 😊 (Birch, 1999)
  - Enthusiastic consumption (Hendy & Raudenbush, 2000; Powell et al., 2015).

- Palfreyman et al., 2015
  - Parallels between parent and child
  - Intentional vs non-intentional
Modelling of Parental Eating Behaviour:

A tendency to overeat in the presence of palatable foods or other disinhibiting stimuli, such as emotional stress

- Associated with:
  - Lower child satiety responsiveness (Birch & Sullivan, 1991)
  - EAH (Francis et al., 2007)
  - Higher emotional & external eating (Powell et al., 2011)
  - Higher child body fat (Hood et al., 2000)

- Genetics? (e.g., Provencher et al., 2005),
- Shared environment?
  - Explains 40% of the variance (de Castro and Lilienfield, 2005).

Behavioural phenotype that may emerge as result of environmental exposure
Do parental feeding practices help to explain links between parent and child eating?

Mothers’ eating behaviour

Child eating behaviour

Powell et al., (2011)
Do parental feeding practices help to explain links between parent and child eating?

Mothers’ eating behaviour → Feeding practices → Child eating behaviour

Powell et al., (2011)
Do parental feeding practices help to explain links between parent and child eating?

IV
Mothers’ eating behaviour

Mediator
Feeding practices

DV
Child eating behaviour

Powell et al., (2011)
MOTHERS’ FEEDING PRACTICES AND EATING BEHAVIOUR

Powell et al., (2011)

- Aimed to explore the relationship between children’s obesogenic eating behaviour (FR and EmE) and
  - mothers’ emotional and external eating
  - mothers’ child feeding practices

- To explore whether parents’ child feeding practices may help to explain the relationship between parent and child eating

Participants

- 142 mothers (mean age 37 years) of children aged 2-8 years (mean age 5 1/2 years)
**Mediation Analysis – Partial Mediation**

Step 1: $p = .001 \ \beta = .280$
Step 2: $p = .007 \ \beta = .230$

- **External Eating** → **Emotion Regulation** → **Food Responsiveness**
  - $P = .001 \ \beta = .281$
  - $P = .003 \ \beta = .244$

Step 1: $p = .001 \ \beta = .275$
Step 2: $p = .010 \ \beta = .221$

- **Emotional Eating** → **Emotion Regulation** → **Food Responsiveness**
  - $P = .0001 \ \beta = .313$
  - $P = .003 \ \beta = .244$

* Goodman test $p = .05$
Do parental feeding practices help to explain links between parent and child eating?

- Parents use of food for ER helps to explain the link between parents Em & Ex eating and their child’s food responsiveness.
- Only partial mediation which means other variables also likely to account for links between parent and child eating.
Socio-demographic & cultural Context

- To explore the views of parents in Luton on healthy diet and weight for their children.

Objectives
- To explore parents’ knowledge, beliefs and self-perceptions of healthy diet and
- To explore parents’ views on how the barriers to achieving and maintaining a healthy diet and weight can be overcome.
# The Study Sample

- 24 focus groups carried out (2-8 participants in each)
- N = 110 parents; 63 mothers, 47 fathers

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**What does this mean?**

- Parental choices about the type, volume and frequency of eating episodes

- Goes further than that: feeding practices, mealtime structure & dynamic, caregivers’ own eating behaviour

- Covert rather than overt control might be the best approach
  - Availability & exposure
    - Children eat the foods made available to them: familiar
  - Modelling
    - Healthy role modelling is associated with more adaptive eating behaviour: role family mealtimes

- How can we promote this to parents?

- What barriers to parents face?

- Different approaches dependent on social demography & ethnicity?
THANK YOU