

Do parental feeding practices moderate the relationships between impulsivity and eating in children?

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Abstract

This study examines the relationships between children's impulsivity, their eating behaviours, and their perceptions of their parent's feeding practices. It also explores whether children's experiences of controlling parental feeding practices interact with their levels of impulsivity in predicting their eating behaviours. One hundred and fifty three 10-13 year old school children completed questionnaires assessing their eating behaviours, their impulsiveness and their perception of their parent's feeding practices. Children's reports of dysfunctional eating behaviours were significantly correlated with their perceptions of their parents feeding practices and with their levels of impulsivity. In addition, children's reports of parental monitoring of their food intake significantly moderated the influence of child impulsiveness upon emotional eating. Children's perceptions of parental monitoring of their food intake may potentially have a protective effect at preventing more impulsive children from eating in response to emotional feelings.

Key words: Child, external eating, emotional eating, control, monitoring, impulsivity

1. INTRODUCTION

There has been a wealth of recent research exploring the impact that child temperament has upon the tendency to overeat and gain weight, and one aspect of temperament that has been linked to overeating in children is the trait of impulsivity (Braet et al., 2007). Impulsivity can be defined as ‘behaviour that incorporates a component of rashness, lack of foresight, or planning, or ... behaviour that occurs without reflection or careful deliberation’ (Braet et al., 2007, pp. 474). People who are impulsive are often more sensitive to, and more likely to approach, rewarding stimuli and they also tend to be worse at inhibiting and controlling their responses to signals, one of which is the tendency to eat. Previous research, using both questionnaire and experimental methods, has found that impulsivity is higher in obese children relative to controls, and particularly in children who binge eat (Nederkoorn et al., 2006; Braet et al., 2007). Impulsivity has also been associated with bulimia nervosa and binge eating disorder (Fischer, Smith & Cyders, 2008), and has been shown to predict lower weight loss in treatment programmes for obesity (Nederkoorn et al., 2007).

The impact of a child’s temperament on their behaviour clearly does not exist in a vacuum, and according to theories of development there are a host of environmental and societal influences that will moderate the relationships between a child’s personality and their behaviour (e.g. Belsky, 1984). Parents are also influential to child eating and research has demonstrated that parenting practices, particularly overly-controlling feeding practices, can disrupt the child’s ability to attend to their internal regulation of hunger and satiety (Birch, Fisher & Davison, 2003; Farrow & Blissett, 2006). Most research in this area has

focussed on 3 aspects of parental control of children's food intake, specifically: pressure to eat, restriction of food, and monitoring of food intake (Birch et al., 2001).

Pressuring children to eat has been shown to predict more negative comments about pressured food and a greater refusal of pressured food both in childhood and adulthood (Batsell et al., 2002; Galloway et al., 2006). It has also been shown to predict emotional disinhibition with food (Carper, Fisher & Birch, 2000) and has been linked to slower weight gain and weight loss in longitudinal research with children (Faith et al., 2004a; Farrow & Blissett, 2008). Conversely, restricting children's access to food, and consumption of food, has been shown to result in a greater desire to eat restricted food (Fisher & Birch, 1999). Restriction has also been linked to greater behavioural responses to restricted food (Fisher & Birch, 1999) and predicts greater eating in the absence of hunger, greater emotional eating and weight gain in longitudinal research (Birch, Fisher & Davison, 2003; Galloway, Farrow & Martz, 2010; Faith et al., 2004a). Findings have been equivocal regarding the relationships between monitoring child food intake and child BMI (e.g. Brann & Skinner, 2005; Roemmich et al., in press), but monitoring has been suggested to have a protective effect in reducing the likelihood of child overweight and weight gain from age 5-7 years (Brann & Skinner, 2005; Faith et al., 2004b).

Given that impulsivity is assumed to predict weight gain because impulsive children struggle to control the tendency to overeat, it is quite likely that the relationship between impulsivity and eating would be impacted upon by over-controlling parental feeding practices which may also undermine the child's ability to respond to their natural cues of hunger and satiety. However, to date the literatures on parenting behaviour and children's impulsivity have generally existed in isolation in exploring the development of children's

eating. Experimental research has found that child food intake can be predicted by levels of child impulsivity *in interaction* with the amount of variety in their food environment: with impulsive children who are exposed to high levels of variety being the most susceptible to overeating (Guerrieri, Nederkoorn & Jansen, 2008). To date however there has been a lack of research exploring how impulsivity and experiences of control with food may together influence eating. As the link between impulsivity and eating appears to reflect the inability to control intake of food it seems logical to explore how overly controlling parental feeding practices may moderate the relationship between impulsivity and eating behaviours in children.

The first aim of the present research was to explore whether children's emotional and external eating are related to their impulsivity and their reports of parental controlling feeding practices. There has been a lack of research exploring the impact that parental feeding practices have upon eating with older children, with most studies focussing on these relationships during early childhood where it is necessary to use parental report (e.g. Faith et al., 2004b; Farrow & Blissett, 2008). Given that parent and child recollections of parental feeding practices are often unrelated (Galloway et al., 2010) this research aimed to explore these relationships using a group of older children who could report on their eating and feeding themselves. The second aim of the research was to evaluate whether children's experiences of controlling parental feeding practices interact with their levels of impulsivity in predicting their emotional and external eating. It was hypothesised that impulsivity and recollections of controlling feeding practices would interact in predicting emotional and external eating, such that more impulsive children who are additionally exposed to greater

pressure to eat, greater restriction of food, and to less monitoring of their food intake would be the most likely to report emotional and external eating.

2. MATERIALS & METHODS

2.1. Participants: One hundred and fifty three pupils from 3 UK secondary schools were involved in this study; 61 participants were male and 92 were female. A greater number of girls were involved as one of the schools that participated was a single-sex school. Children in classes from Years 6-8 participated (aged 10-13 years) since this is a period when children are most sensitive to their eating and weight (Paxton, 1996). The mean age of the sample was 11 years (SD = 1.09). One hundred and forty three participants described their ethnicity as White; 3 as Black or Black British; 2 as Asian or Asian British; 3 as Mixed Race and 1 as 'Other'. This research was reviewed and approved by the University Research Ethics Committee. Parental consent was gained for all participants to take part in this research, and all children gave full informed verbal assent to participate.

2.2. Measures: The children all completed the following measures:

2.2.1. *Dutch Eating Behaviour Questionnaire* (DEBQ: van Strein, Frijters, Berger & Defares, 1986). Children completed the DEBQ to assess their emotional and external eating. External eating assesses eating for reasons other than hunger, for example because of the smell or sight of food, or because other people are eating. Emotional eating assesses eating in response to a range of emotions such as boredom, loneliness and anger. This questionnaire has been shown in previous research to have good external validity, internal consistency, and factorial validity in adults and children (van Strein et al., 1986; Wardle, 1987; Wardle et al., 1992), and has been used previously with children in this age range

(e.g., Brown & Odgen, 2004). The scales were internally reliable with Cronbach's alphas of .82 and .89 for emotional and external eating respectively.

2.2.2. *Eysenck's Impulsiveness Questionnaire* (EIQ: Eysenck et al., 1985). The impulsiveness scale of the EIQ was used to measure child impulsiveness. The EIQ is a widely used questionnaire and this scale assesses acting or speaking on impulse without appropriate prior thought. The EIQ is a well used measure with adults and children in this age range (Brunas-Wagstaff, Tilley, Verity, Ford & Thompson, 1997; Clark, 2004; Soloff, Lynch & Moss, 2000) and has been associated with cognitive aspects of impulsivity (Carrillo-de-la-Peña, Otero & Romero 1993). The scale was internally reliable for the children with a Cronbachs alpha of .73.

2.2.3. *Kids-Child Feeding Questionnaire* (KCFQ: Carper, Fisher & Birch, 2000). The Kids-Child Feeding Questionnaire was used to assess children's reports of parental pressure to eat and restriction. The pressure to eat subscale consists of 7 items which assess to what extent the caregiver encourages the child to eat beyond the child's chosen amount. The restriction subscale also consists of 7 items which assess how much the caregiver restricts the child's intake of sweet, high fat and favourite foods. These subscales of the CFQ are widely used to assess parental control over child feeding (Carper, Fisher & Birch, 2000; Francis, Hofer & Birch, 2001), and the KCFQ has been shown to have good internal consistency in previous research (Carper, Fisher & Birch, 2000). In addition items from the original Child Feeding Questionnaire (Birch et al., 2001) were adapted to assess children's perceptions of parental monitoring of their food intake. The monitoring subscale included 6 items which assessed how often the child's primary caregiver monitored the child's

intake of sweet, snack and high fat foods, and how much this person monitored what and when the child ate. Cronbach's alpha for this scale was high at .82

2.3. Data Analysis: First, descriptive statistics were computed for all variables. Pearson's 2-tailed correlations indicated that there were no significant relationships between child age with their external eating, impulsivity or recollections of parental control, although child age was negatively correlated with emotional eating ($r=-.17$, $p<.05$). Independent sample t-tests identified no significant gender differences in levels of external or emotional eating, or in levels of impulsivity, or recollections of pressure to eat or restriction. However, boys reported significantly more monitoring over their food intake compared to girls [$t(172)=2.18$, $p<.05$; male mean=1.21 (SD=.54), female mean=1.02 (SD=.59)]. Child age and gender were therefore controlled for in all analyses. Partial correlations (controlling for child age and gender) were used to investigate the relationships between child eating, impulsiveness and reports of parental control over food intake. Where impulsiveness and controlling feeding practices were both significantly correlated with child eating, moderated regression analyses were used to test whether the relationships between impulsiveness and eating were moderated by experiences of controlling feeding practices. Child age and gender were entered as a control variable in the first step of the analysis, then the centered independent variable and centered moderator were entered in step 2 to control for their main effects, the interaction effect of these centered variables was then entered in step 3. Where significant, the effects of the independent variable at three different levels of the moderator were assessed by using simple slope analysis (Aiken & West, 1991).

3. RESULTS

3.1. Descriptive statistics and relationships with demographic variables: Descriptive statistics for the questionnaires are presented in Table I where the means and standard deviations are similar to other published data (Wardle et al., 1992; Carper et al., 2000; Stadler & Janke, 2003). In order to gain an index of the weight distribution in the sample pupils were also asked to report their weight and height. Using age and gender appropriate cut off scores 83% of the sample was classified as normal weight or underweight, 13% as overweight and 4% as obese (Cole, Bellizzi, Flegal & Dietz; 2000). These data are similar to other published data from children of this age, suggesting that the sample was representative in terms of BMI (Fox & Farrow, 2009). (Table I about here).

3.2. Correlation analyses: Partial correlations were used to explore the relationships between child eating behaviour, impulsivity and recollections of parental feeding practices. Children's reports of external eating were correlated with greater impulsiveness and with recollections of less restriction and less monitoring of food intake, whilst reports of emotional eating were correlated with greater impulsiveness and less recollections of parental monitoring over food intake. (Table II about here).

3.3. Moderation analyses: Given that children's reports of their external and emotional eating were correlated with parental feeding practices as well as child impulsivity, moderated regression analyses (Aiken & West, 1991) were used to explore whether the relationships between child impulsivity and eating were moderated by perceptions of parents control over eating. Child age and gender were controlled for in all analyses.

3.3.1. *External eating.* The relationships between child impulsivity and external eating were not significantly moderated by children's reports of parental monitoring ($\beta = -.00$, Beta = $-.01$, $t = -.18$, $p > .05$) or restriction ($\beta = .03$, Beta = $.05$, $t = .62$, $p > .05$).

3.3.2. *Emotional eating:* There was a significant interaction between student's impulsiveness and their perceptions of parental monitoring over their food intake in predicting emotional eating ($\beta = -.09$, Beta = $-.29$, $t = -3.79$, $p < .001$). The interaction between child impulsiveness and parental monitoring was significant at predicting emotional eating when the moderator was at the mean ($B = .44$, $t(139) = 3.09$, $p < .01$) and one standard deviation below the mean ($B = .10$, $t(139) = 4.89$, $p < .01$), but not when the moderator was one standard deviation above the mean ($B = -.01$, $t(139) = -.54$, $p > .05$). As Figure I indicates the relationship between child impulsivity and emotional eating was significant when participants reported that their parents used an average or low amount of monitoring of their food intake. When children reported that their parents used higher levels of monitoring over their food intake the relationship between impulsivity and emotional eating was not significant. (Figure I about here).

4. DISCUSSION

The aims of this research were to investigate the relationships between children's levels of impulsiveness and their reports of parental controlling feeding practices in relation to their external and emotional eating. The data indicates that reports of emotional and external eating were associated with child impulsiveness and with recollections of parental restriction and monitoring of food intake. Furthermore, children's reports of parental monitoring of their food intake significantly moderated the influence of impulsiveness upon emotional eating.

Children who reported greater levels of impulsiveness also reported more external and emotional eating. These relationships support previous research that has suggested that more impulsive children are more likely to overeat or binge eat and highlight the important impact that an impulsive temperament can have upon dysfunctional eating related behaviours (Guerrieri et al., 2008; Braet et al., 2007). The results also demonstrate that children who reported higher levels of parental restriction reported lower levels of external eating. Whilst it is unclear how parental restriction is related to external eating, parental restriction may teach children to restrict their response to their internal signals of hunger and to not respond by eating, thereby limiting their external eating. Whilst several previous studies have shown that restrictive feeding practices can lead to eating in the absence of hunger and weight gain in young children (Birch et al., 2003), recent literature has begun to emerge suggesting that greater maternal restriction predicts lower child energy intake during free access procedures in the laboratory (Sud, Tamayo, Faith & Keller, 2010) and is predictive of lower child BMI in longitudinal studies with children (Farrow & Blissett, 2008; Campbell et al., 2010). These findings reported here are novel in exploring these relationships between parental feeding and eating in samples of older children and suggest a potential mechanism through which maternal restriction may predict subsequent lower BMI, i.e. through child eating behaviours. The equivocal findings concerning the effects of parental restriction clearly require further exploration. Jansen, Mulken & Jansen (2007) have found that children exposed to a moderate amount of restriction at home are less likely to consume a greater food intake in experimental procedures, and recent work by Sud et al. (2010) suggests that the effects of parental restriction may depend upon the context of the parents overall parenting style and may also be moderated by the family ethnicity, it is also

possible that the effects of parental restriction depend upon the types of foods restricted, the overtness of restriction (Sud et al., 2010), the child's BMI, the availability of high-fat foods, and the reasons given for restricting food. Further research is required to delineate the concept of restriction in more detail and to address how different types of parental restriction may impact differently on children eating behaviours.

Children's reports of maternal monitoring were negatively correlated with their reports of external and emotional eating, supporting previous research that suggests that monitoring children's food intake may have a protective effect against overeating and weight gain in children (Brann & Skinner, 2005; Faith et al., 2004b). These findings could also result from children being aware that they are being monitored and therefore reporting less emotional and external eating because they believe this is socially desirable. Previous research findings on the relationships between monitoring and eating in children have been equivocal (e.g., Kaur et al., 2006) and further research is needed to explore the potential positive and negative consequences of monitoring for child eating using experimental procedures and observational work with real life validity.

In support of the hypotheses, children's reports of parental monitoring significantly interacted with their levels of impulsiveness in predicting their emotional eating. In particular the relationship between impulsivity and emotional eating was significant when participants reported that their parents used an average or low amount of monitoring of their food intake. When children reported that their parents used high levels of monitoring over their food intake the relationship between impulsivity and emotional eating was no longer significant. These findings support previous research which has shown that levels of impulsivity can predict dysfunctional eating and weight gain in children (Nederkoorn et al.,

2006; Braet et al., 2007), and that monitoring children's food intake can have a positive influence on their eating and weight (Brann & Skinner, 2005; Faith et al., 2004b). What is novel about these findings is that they demonstrate that higher levels of monitoring with more impulsive children may be associated with lower levels of emotional overeating. Just as previous research has found that exposure to variety in food intake can exacerbate the effects of impulsivity on eating in children (Guerrieri et al., 2008), these findings may suggest that the perception of not having any parental monitoring over food intake may result in more emotional overeating in impulsive children who are at greater risk of this negative eating related behaviour. However, this research was cross-sectional and further research is needed to explore causal pathways.

Surprisingly children's recollections of experiencing pressure to eat were not significantly correlated with their external or emotional eating behaviours. Moreover, neither pressure nor restriction moderated the relationships between impulsivity and eating as hypothesised. It is possible that the differences identified here are a function of using child report, but previous research with younger child report has found significant relationships between perceived parental pressure to eat and eating in girls (Carper, Fisher & Birch, 2000). It is also possible that these differences reflect the older age of the sample used, indeed research with young adults has found that recollected parental pressure is not correlated with current maladaptive eating behaviours (Galloway et al., 2010). This study may be underpowered to detect such effects and further research with larger samples could address this concern.

It is important to note that the current research was cross-sectional and so further experimental and longitudinal research is needed to establish patterns of causality.

Furthermore, all of the data gained from this research was self report and so further work is needed to validate children's reports of their eating or feeding. Whilst the focus of this study was on the impact of impulsiveness and parental feeding upon children eating, further work is needed to explore what impact these relationships also have upon child weight by using experimenter measured weight and also evaluating these associations in clinical samples of obese children where these relationships may well be different.

The findings of this research have important implications for exploring dysfunctional eating behaviours in samples of children. Firstly the results demonstrate the important relationships between child impulsiveness, perceived parental restriction and monitoring of food intake with child eating behaviour. Further the findings suggest that higher levels of perceived parental monitoring were associated with reduced emotional overeating in more impulsive children: findings which may be useful for informing interventions designed to prevent dysfunctional eating in children. While research on the effects of parental monitoring has been mixed (Brann & Skinner, 2005; Kaur et al., 2006) these data suggest that in samples of children who are more impulsive and thus prone to emotionally overeating, greater levels of parental monitoring of their children's food intake may be beneficial for reducing emotional eating. Future research should focus on delineating the concept of monitoring in more detail and identifying which aspects of parental monitoring may be most beneficial, and which aspects could be potentially harmful in influencing children's independent food choices and behaviours.

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