Perceived parental control of food intake is related to external, restrained and emotional eating in 7–12-year-old boys and girls

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Abstract

This study examined the prevalence of external, restrained and emotional eating and the relationship of these disturbed types of eating behaviours with perceived parental control of food intake (pressure to eat and restriction) in a group of 7- to 12-year-old boys and girls (n = 596). External eating turned out to be the most prevalent disturbed eating behaviour for boys and girls, followed by restrained eating and emotional eating. Sex differences were found in external and restrained eating. For the boys, perceived pressure to eat was positively related to emotional and external eating. For both sexes, perceived restriction to eat was negatively related to emotional and external eating and positively related to restrained eating. This led to the conclusion that perceived pressure to eat has a disruptive effect on a child’s self-regulating mechanism of food intake, particularly so for boys, whereas perceived restriction can also have a positive effect.

Keywords: DEBQ-emotional; External and restrained eating; Boys; Girls; Perceived parental control of food intake; Overweight; DEBQ-C

Introduction

There is evidence that very young children adjust their food intake in response to the energy content of the food, thus showing a self-regulating mechanism (Birch & Deysher, 1985, 1986; Birch & Fisher, 1998). This adequate self-control and ability to use cues of hunger and satiety to initiate and terminate eating can (unintentionally) be diminished by parental controlling approaches, such as parental pressure to eat or parental restriction to eat (Birch, Fisher, & Davison, 2003; Carper, Fisher, & Birch, 2000). Parental pressure to eat may have the outcome that children stop using their own satiety to terminate their eating and learn instead to focus on external cues, such as the amount of food on the plate, or emotions. Also restrictive controlling practices may have the outcome that children stop using their self-regulating mechanism of food intake, for instance when parents say things like “You have had enough to eat now, you need to stop”. See Faith, Scanlon, Birch, Francis, and Sherry (2004) for an overview of literature.

In both parental controlling approaches, there is insufficient regard for the real needs of the child; the child’s awareness of hunger and satiety may get lost and the eating behaviour may become dominated by external or emotional factors. The child learns, for instance, to eat in response to food cues such as sight and smell of food and may thus become an ‘external eater’ (Rodin, 1981). There is also a risk that the child becomes an emotional eater, which entails that parental pressuring or restrictive controlling approaches on food intake may be negatively associated with the development of interoceptive awareness of a child. It may develop difficulties to recognise whether it is hungry or satiated or suffering from some other discomfort, which may result in a pattern of responding to virtually any arousal state by food intake: emotional overeating (Bruch, 1973). A third outcome may be that the child develops a restrained eating style, in the sense that it habitually suppresses feelings of hunger cognitively and eats less, which is a risk factor for overeating as well; when cognitions are undermined, for example by eating a
forbidden food, restrained eaters are likely to overeat (Herman & Polivy, 1980).

All three types of eating behaviours are considered aetiological factors for binge eating, obesity and other eating pathology (Canetti, Bachar, & Berry, 2002; Van Strien, Frijters, Bergers, & Defares, 1986), and can therefore be designated as disturbed eating behaviours. However, little is known about the prevalence of these disturbed types of eating behaviours in young children and the relationships these types have with parental control of food intake. Carper et al. (2000) studied the prevalence of external, emotional and restrained eating in 5-year-old girls. They found that 75% of 197 girls showed a high degree of external eating, one-third reported moderate levels of dietary restraint and 25% showed evidence of moderate levels of emotional eating. High degrees of external and restrained eating were also found in other studies, examining girls between 5 and 12 years old (Birch & Fisher, 1998; Francis & Birch, 2005; Hill & Franklin, 1998; Hill, Oliver, & Rogers, 1992). External eating was found to be particularly prevalent in the population of obese children (Birch et al., 2003; Fisher & Birch, 2002; Jansen et al., 2003).

To our best knowledge, there are no studies on the prevalence of emotional, external eating and dietary restraint in boys, and only the study by Carper et al. (2000) was concerned with the association of the three types of eating behaviours with parental control of food intake. This study of 5-year-old girls pointed out that parental pressure to eat was positively associated with emotional, external and restrained eating, whereas parental restriction to eat was negatively associated with external eating.

The primary aim of the present study is to elaborate upon the findings of the study of Carper et al. (2000) by examining 7- to 12-year-old boys. A sample of girls of the same age will be examined as well, to study whether the results of Carper et al. can also be replicated in an older sample of girls. Additionally, we will determine possible moderator effects of children’s weight status and age. Corresponding to the findings of Carper et al., we expect that external eating is the most prevalent eating behaviour in boys and girls, followed by restrained eating and emotional eating. Furthermore, we expect to replicate the findings of Carper et al. regarding the relationships of parental control with the disturbed types of eating behaviour, by studying the parental controlling approaches as perceived by the child. Finally, we expect that overweight children show more external and restrained eating than children with a normal weight status, as found in some other studies.

**Method**

**Participants**

The sample consisted of 597 children, originating from seven primary schools in the eastern part of the Netherlands. The boys (n = 294) had a mean age of 9.8 years (SD = 1.4). A total of 82.7% had a normal weight status, according to the children’s body mass index, adapted for age and sex; weight/(height × height) (Voedingscentrum, 2006), 16.7% was overweight and 0.7% underweight. Girls (n = 303) had a mean age of 9.6 years (SD = 1.4). 79.2% had a normal weight status, 19.8% was overweight and 1% was underweight. Weight was measured in light clothing and without shoes, to the nearest of 0.1 kg. Height was also measured according to standard procedures (without shoes and hair decorations), to the nearest of 0.5 cm. Data of one girl were left out of the analysis, because of many missing values.

**Procedure**

Parental consent was obtained for all children. The questionnaires were filled out under supervision of a researcher. Questions could be asked to the researcher, to ensure that the children understood the meaning of each item of the questionnaires.

**Materials**

**Children’s version of the Dutch eating behaviour questionnaire (DEBQ-C)**

The DEBQ-C (Van Strien & Oosterveld, in press) consists of three scales assessing emotional, external and restrained eating behaviour. The DEBQ-C is an age-adapted 20-item version of the Dutch Eating Behaviour Questionnaire (Van Strien, 2002; Van Strien et al., 1986), and differs from the 33-item age adapted version used by Carper et al. (2000). The DEBQ-C has a three-choice response format of no (1), sometimes (2) or yes (3). An example of an emotional eating item is: “Do you feel like eating when you’re upset?” An example of an external eating item is: “Do you intentionally eat food that helps you lose weight?” An example of a restrained eating item is: “Do you restrict the amount of food you eat to control your weight?”

Single and multi-group confirmatory factor analyses on 769 preadolescent children aged 7–12 years showed that the fit measures for the three-factor model and the factorial invariance models with respect to sex, BMI status and age were satisfactory. Additionally, the scales showed satisfactory correlations with measures such as frequency of consumption of snacks (Van Strien & Oosterveld, in press). The internal consistency (Cronbach’s alpha) for emotional, external and restrained eating in the present sample was, respectively, 0.82, 0.74 and 0.80 for boys and for girls, respectively, 0.77, 0.75 and 0.83.

**Children’s version of the child feeding questionnaire (KCFQ)**

The KCFQ questionnaire contains two subscales: ‘pressure to eat’ and ‘restriction’ of snacks and controlling the amount of food consumed by the child. In contrast to Carper et al. (2000), we only examined the child’s perspective of parental control. This, because in the study
of Carper et al., parental reports of control showed only weak (in case of pressure to eat) or no (in case of restriction) relationships with the daughters reports of parental control. Moreover, neither parent’s reports of restriction nor their reports of pressure to eat were related to their daughters restrained or overeating tendencies (emotional or external eating). Only the girls’ perception of pressure or restriction to eat acted as a predictor for dietary restraint and overeating tendencies (see further: Carper et al.). Another difference is that in this study, we did not measure control of the mother and of the father with separate questionnaires, but used one and the same questionnaire to measure this, from the viewpoint that particularly the very young children cannot be expected to have a concentration time-span long enough to answer highly similar questions twice. This was done, for instance, by questioning: “Does your mummy (or daddy) make you eat all the food on your plate?” (pressure to eat subscale) and “Does your mummy (or daddy) ever let you have snacks?” (restriction subscale).

An inspection of the two-factor solution (principal component analysis, Varimax rotation) of all 16 KFCQ-items on pressure to eat and restriction (for these items, see the Appendix of Carper et al., 2000), in the present sample of children revealed that two items on restriction (e.g. items 8 and 15) showed higher loadings on the pressure to eat factor (their negative loading indicated that they should be recoded). Additionally, three items (items 4, 9 and 13) showed loadings lower than <0.35 on the factors, which indicated that they could better be deleted. As a result, the present subscale ‘pressure to eat’ consisted of eight items (items 1, 2, 3, 5, 6, 7, 8 and 15) and the ‘restriction’ subscale of five items (items 10, 11, 12, 14 and 16) (see for these items the Appendix of Carper et al.; restriction items should be recoded such that high scores are indicative of high perceived parental restriction). The internal consistency for the subscales ‘pressure to eat’ and ‘restriction’ was for boys, respectively, 0.75 and 0.62; for girls, respectively, 0.77 and 0.58.

Data analysis

All variables were observed for skewness and, except for emotional eating, which showed a skewness of 1.56, no problems were observed. Next, descriptive analyses were conducted to gather information about the means, standard deviations and intercorrelations of the variables at study for boys and girls, age-groups (7–9 and 10–12 years) and weight status. The differences in the distribution of sex, age-group and weight status of the children’s scores on the KCFQ and the DEBQ were measured with an independent samples t-test. Measures of BMI status in this sample revealed that only five children (0.84%) were underweight. Therefore, underweight children and children with a normal weight status (according to BMI measures) were combined into one group, resulting in two groups to examine: children with a normal weight status and overweight children.

Children were nested within classes and classes were nested within schools and data are therefore hierarchic. However, in none of the multilevel (regression) analysis, we found an effect for school and though there were significant (though small) effects for classes, highly similar results were obtained in hierarchical regression analysis. Therefore, we decided to use the more parsimonious hierarchical regression analyses instead. In three separate hierarchical regression analyses, we tested the following effects: sex (dummy coded as 0 (boys) and 1 (girls)), age and body weight status (dummy coded as 0 (normal weight) and 1 (overweight)); perceived pressure to eat, restriction to eat (step 1), their two-way interactions (step 2) and the three-way interactions of body weight status with pressure to eat and with sex or age, and of body weight status with restriction to eat and with sex or age (step 3) on emotional eating, external eating and restrained eating. Emotional eating was due to its skewness transformed, using a log transformation. After this transformation, the skewness ceased to be a problem. To facilitate interpretation and reduce problematic collinearity between main effects and interaction terms, all variables were mean-deviated or centred prior to the regression analysis (i.e. the overall mean was subtracted from the values of a variable (Aiken & West, 1991; Whisman & McClelland, 2005). An alpha level of 0.5 was used for all statistical tests. All analyses were performed with SPSS 14.0.

Results

Descriptive statistics

As shown in Table 1, external eating showed the highest prevalence, both for the girls and the boys. Next was dietary restraint whilst emotional eating was found to have only a low prevalence in both groups. As can be seen in Table 1, boys scored significantly higher on external eating, whereas girls scored significantly higher on restrained eating, but in regard to perceived parental pressure or restriction to eat no significant differences between the sexes were found. With respect to differences between age groups—the younger (7–9 years) versus older (10–12 years) boys and girls: both sexes scored significantly higher on emotional and external eating in the younger than in the older age-group. Perceived pressure to eat was only higher in the younger boys, whereas perceived restriction to eat was only higher in the younger girls. With respect to differences between the normal-weight and overweight boys and girls, overweight boys scored significantly lower than normal weight boys on external eating, whereas girls showed no difference in this regard. It can be said for both sexes that those with overweight had significantly higher scores on dietary restraint and perceived more parental restriction to eat. Only the overweight boys indicated significant lower degrees of perceived parental pressure to eat as well.
Correlation coefficients

As can be seen in Table 2, in both groups emotional and external eating correlated significantly, also when we corrected for age (as continuum) and weight category in partial correlation analysis. In the boys restrained eating showed a significant negative relationship with external eating. This negative relationship increased in strength after correction for age, but disappeared after correction for weight category. In the group of the girls restrained eating showed a significant negative relationship with external eating only after correction for age. A further remarkable finding was that there was a significant positive correlation of perceived parental pressure to eat with emotional and external eating only for the boys. This relationship remained significant when we corrected for age or for weight category. For the girls, on the contrary, we found no association of perceived parental pressure to eat with either emotional or external eating, neither when we corrected for age or weight category. Furthermore, perceived parental restriction to eat was for the boys negatively associated with both emotional and external eating but positively associated with restrained eating. These findings remained significant after correction for age and weight category. Highly similar findings were found in the group of the girls, with as only difference that perceived parental restriction to eat was only significantly associated with emotional eating after correction for age or weight category. Finally, significant correlations were found for both sexes between perceived parental pressure to eat and perceived parental restriction to eat. These results were hardly affected by correction for age or weight category.

Hierarchical regression analyses

There were no significant three-way interactions of bodyweight status for pressure to eat and with sex or with age for either emotional eating, external eating or restrained eating. The same applied for the three-way interactions of bodyweight status with restriction to eat with sex or with age, so only the outcomes of the first two steps of the regression analyses are reported here (Table 3).

Emotional eating

Age and perceived restriction to eat were significantly related to lower levels of emotional eating and perceived pressure to eat was significantly related to higher levels of emotional eating (see Table 3). Furthermore, we found that the relation between perceived restriction to eat and emotional eating was significantly moderated by age, and that the relation between perceived pressure to eat and emotional eating was significantly moderated by sex. To understand these interactions, we examined separate regression equations that represented the association between emotional eating and perceived restriction to eat for younger and older children (< 9 years versus > 10 years), in addition to separate regression equations that represented the association between emotional eating and perceived pressure to eat for boys and for girls. It turned out that perceived restriction to eat was more strongly related to lower levels of emotional eating in the younger than in the older children. Additionally, perceived pressure to eat was significantly related to higher levels of emotional eating for the boys whereas no such relationship was found for the girls.

External eating

Sex, age and restriction to eat were significantly related to lower levels of external eating and perceived pressure to eat was significantly related to higher levels of external eating. Furthermore, we found that the relation between perceived pressure to eat and external eating was significantly moderated by sex. To understand this interaction, we examined separate regression equations that
represented the association between external eating and perceived pressure to eat for boys and for girls. It turned out that perceived pressure to eat was significantly related to higher levels of external eating for the boys but that this relationship was absent for the girls.

**Restrained eating**

Sex, weight status and perceived restriction to eat were significantly related to higher levels of restrained eating and age was significantly related to lower levels of restrained eating. Furthermore, we found that the relation between perceived restriction to eat and restrained eating was significantly moderated by weight status. To understand this interaction, we examined separate regression equations that represented the association between restrained eating and perceived restriction to eat for children with a normal weight and for overweight children. It turned out that perceived restriction to eat was more strongly related to higher levels of restrained eating for the overweight than for the normal weight children.

**Discussion**

In a study on 5-year-old girls, Carper et al. (2000) found that external eating was the most prevalent disturbed eating behaviour, followed by restrained eating. Emotional eating was reported at a very moderate level. Perceived pressure to eat was positively associated with emotional, external and restrained eating; perceived restriction was negatively associated with external eating. In this study, we examined the findings of a replication of this study regarding older girls (7- to 12-year-old). We also examined a large sample of boys of the same age, which had not been done before. In addition, the prevalence and possible moderator effects, such as sex, age and weight status of the children were assessed.

In the present study, highly similar prevalence rates of the three types of eating behaviours were found, both for the girls as for the boys. The very low prevalence of emotional eating for both sexes is remarkable and may mean that most young children show the natural reaction to emotional stressors (loss of appetite when feeling lonely, depressed or anxious) and that emotional eating for most people only starts to occur later in life. Both external eating and dietary restraint showed associations with sex in that the boys showed more external eating and less dietary restraint than the girls. The higher degree of external eating in the boys may indicate that boys are more vulnerable to external food cues, like the sight or odour of palatable food. The higher dietary restraint in the girls is in accordance with results of the study of Edmunds & Hill (1999). Both emotional and external eating were found to be associated with age, in the sense that younger children reported higher degrees of these eating behaviours than the older ones. This finding is remarkable but a satisfactory explanation cannot be deduced from the results of this research.
Unlike the findings of Carper et al. (2000), perceived parental pressure to eat was not positively associated with emotional and external eating for the girls. Such relationships were only found for the boys. In practice, this may mean that parents should be discouraged to press the child to eat when it indicates that it has had enough, particularly so when it involves a male child, because it may risk losing contact with its self-regulating mechanism of eating behaviour and therefore run a higher risk on developing disturbed eating behaviour. Also in contrast to the study by Carper et al., we did not find that perceived pressure to eat was associated with higher levels of dietary restraint for neither girls or boys. Carper et al. explained their finding with the desire for autonomy from young girls. Maybe the older children in the present study do not feel the desire to gain autonomy, at least not by showing dietary restraint when they perceive their parents as pressuring them to eat. Similar to the study by Carper et al., we found that perceived parental restriction to eat was negatively associated with external eating. However, in contrast with the results by Carper et al., who found that perceived restriction was only associated with lower levels of external eating, in the present study perceived parental restriction to eat was also negatively associated with emotional eating and positively associated with restrained eating. These findings may indicate that perceived parental restriction to eat, in contrast to perceived parental pressure to eat, has no disruptive effect on a child’s self-regulating mechanisms of eating behaviour; children do not show higher levels of emotional and external eating as a result of perceived parental restriction. On the other hand, the resulting elevated levels of dietary restraint may not be all good, as dietary restraint can also develop into a disturbed type of eating behaviour. Children seem to adapt to perceived parental wishes about their eating behaviour: when they perceive their parents to state that they should not have many snacks, they restrict themselves from eating snacks. However, parents should be very careful that the way their children restrict themselves remains healthy and does not result in extreme restrained eating behaviour. However, for more definite conclusions on this matter, further research is needed. But see also the recent study by Ogden, Reynolds, and Smith (2006).

The prevalence of overweight (one out of every five children) in this sample is similar to the ratings of overweight in the Netherlands from the reports of the World Health Organisation (WHO, 2006). Considering the effects of weight status, a remarkable finding is that overweight children reported higher levels of dietary restraint, but not elevated levels of external eating. Though this latter finding is contrary to some studies (e.g. Jansen et al., 2003), it is in line with other studies on adolescents (Lluch, Hereth, Méjean, & Siest, 2000; Wardle et al., 1992). In one study (Snoek, Van Strien, Janssens, & Engels, 2007), overweight adolescents even scored lower on external eating than normal overweight adolescents. This finding was corroborated in the present study for the boys (see Table 1). Interestingly, the findings of Wardle et al. (1992) and Lluch et al. (2000) showed that although external eating is negatively associated with weight, it is positively related to food intake. The influence of parents could explain this contradiction. In early adolescence, much of the food intake is controlled by parents. For example, parental presence at the evening meal was found to be positively associated with adolescents’ higher consumption of healthy food items (Videon & Manning, 2003). Heavier children are subject to more food control (Tiggemann & Lowes, 2002) and food restriction (Fisher & Birch, 1999; see also the outcomes of the present study; Table 1). This could explain that in some studies overweight children did not show higher scores on external eating and even may score lower on this type of eating

### Table 1

<table>
<thead>
<tr>
<th>Step 1</th>
<th>β</th>
<th>ΔR²</th>
<th>Step 2</th>
<th>β</th>
<th>ΔR²</th>
<th>Step 3</th>
<th>β</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>-0.05</td>
<td>0.14**</td>
<td>Sex x pressure to eat</td>
<td>-0.12**</td>
<td>0.02*</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.32**</td>
<td>0.01</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight status</td>
<td>0.05</td>
<td>-0.11**</td>
<td>0.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure to eat</td>
<td>0.11**</td>
<td>0.11**</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restriction to eat</td>
<td>-0.22**</td>
<td>-0.26**</td>
<td>0.17**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

α At entry.

β p<0.05; ** p<0.01.

### Table 3

Main effects and moderator effects on emotional, external and restrained eating behaviour (pressure and restriction to eat as perceived by the child)

<table>
<thead>
<tr>
<th>Emotional eating</th>
<th>External eating</th>
<th>Restrained eating</th>
</tr>
</thead>
<tbody>
<tr>
<td>β</td>
<td>ΔR²</td>
<td>β</td>
</tr>
<tr>
<td>Step 1</td>
<td>0.14**</td>
<td>0.17**</td>
</tr>
<tr>
<td>Sex</td>
<td>-0.05</td>
<td>-0.11**</td>
</tr>
<tr>
<td>Age</td>
<td>-0.32**</td>
<td>-0.33**</td>
</tr>
<tr>
<td>Weight status</td>
<td>0.05</td>
<td>-0.04</td>
</tr>
<tr>
<td>Pressure to eat</td>
<td>0.11**</td>
<td>0.11**</td>
</tr>
<tr>
<td>Restriction to eat</td>
<td>-0.22**</td>
<td>-0.26**</td>
</tr>
<tr>
<td>Step 2</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Sex x pressure to eat</td>
<td>-0.12**</td>
<td>-0.09*</td>
</tr>
<tr>
<td>Sex x restriction to eat</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Age x pressure to eat</td>
<td>-0.03</td>
<td>-0.01</td>
</tr>
<tr>
<td>Age x restriction to eat</td>
<td>0.10*</td>
<td>-0.03</td>
</tr>
<tr>
<td>Weight x pressure to eat</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Weight x restriction to eat</td>
<td>0.01</td>
<td>-0.04</td>
</tr>
</tbody>
</table>
Parents of overweight children are probably less likely to permit their children to give in to external cues, or to expose them to these cues. This suggestion was supported in the present study by the finding that the positive association between perceived parental restriction to eat and restrained eating was stronger for the children with overweight than for the children with a normal weight.

Some limitations of the present study should be mentioned. Acquiescence and social desirability may have influenced the results, particularly so for the young and/or overweight children. Secondly, the KCFQ had a low reliability, possibly because the items did not make a distinction between mother and father. When the child’s parents do not show the same behaviour, the child might have had trouble to choose the correct answer for that particular aspect of parental behaviour. In future research, it is probably better to ask about only the mothers practices as most fathers tend to spend relatively few mealtimes with their children. A further weakness is that both predictors and outcomes rely on children’s self reports, and that the data are cross-sectional, while longitudinal data are necessary to generate conclusions about the direction of the associations.

One of the stronger points of this study is that it is one of the first to examine disturbed eating behaviour regarding a large sample of young boys, and girls. Another is that body weight and height were measured, and not self-reported.

The high prevalence of external and restrained eating for both the boys and the girls is alarming, as both types of eating behaviours can be taken as indicators of an inadequate self control and an absence of the good ability to use hunger and satiety cues to initiate and terminate eating. This natural self-regulation mechanism for food intake seems to be diminished for many boys and girls of this early age, and parental pressure to eat as perceived by the child seems to play a provocative role in this, particularly so when boys are involved. Perceived parental restriction to eat, in contrast, does not seem to be all that bad, as it is associated with lower levels of emotional and external eating. The higher levels of dietary restraint as a result of perceived parental restriction can become a problematic side-effect when children fall down into serious restrained eating behaviour. This may implicate that not all mechanisms to control a child’s eating behaviour have a negative outcome, provided that the control is exercised in a balanced way.

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References


(Dynamisch/zwangerschap + n + kinderen/vanaf +1 + jaar/gezond + gewicht/bmi + meisjes.htm).


