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Explaining use of food parenting practices: the importance of predisposing factors and parental cognitions

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Abstract

Objective: The high energy intake from energy-dense foods among children in developed countries is undesirable. Improving food parenting practices has the potential to lower snack intakes among children. To inform the development of interventions, we aimed to predict food parenting practice patterns around snacking (i.e. 'high covert control and rewarding', 'low covert control and non-rewarding', 'high involvement and supportive' and 'low involvement and indulgent').

Design: A cross-sectional survey was conducted. To predict the patterns of food parenting practices, multinomial logistic regression analyses were run with 888 parents. Predictors included predisposing factors (i.e. parents' and children's demographics and BMI, parents' personality, general parenting, and parenting practices used by their own parents) and parents' cognitions (i.e. perceived behaviour of other parents, subjective norms, attitudes, self-efficacy and outcome expectations).

Setting: The Netherlands (October–November 2014).

Subjects: Dutch parents of children aged 4–12 years old.

Results: After backward elimination, nineteen factors had a statistically significant contribution to the model (Nagelkerke $R^2 = 0{\cdot}63$). Overall, self-efficacy and outcome expectations were among the strongest explanatory factors. Considering the predisposing factors only, the general parenting factor nurturance most strongly predicted the food parenting clusters. Nurturance particularly distinguished highly involved parents from parents employing a pattern of low involvement.

Conclusions: Parental cognitions and nurturance are important factors to explain the use of food parenting practices around snacking. The results suggest that intervention developers should attempt to increase self-efficacy and educate parents about what constitute effective and ineffective parenting practices. Promoting nurturance might be a prerequisite to achieve prolonged change.

Keywords
Food parenting practices
Snacking
General parenting
Children
Socio-cognitive theory
Cluster analysis
Principal component analysis

The high energy intake from energy-dense foods among children in developed countries[1–3] is undesirable as such foods tend to be of little nutritional value and are superfluous to a healthy diet[4]. Several studies suggest that snacking has increased during the last few decades, thereby contributing to excessive energy intakes[5–8]. It is important to invert this trend and establish healthy dietary patterns in childhood since children's dietary behaviours[9] and overweight[10] track into adulthood. Parents can have a significant impact on their children's food consumption through their food-specific parenting practices[11] (i.e. behaviours used to shape a child's diet, such as restricting children's access to snack foods or modelling healthy food intake[12]). In an earlier publication, based on a cluster analytic approach, we demonstrated that four categories of Dutch parents could be distinguished when it comes to food parenting practices (FPP) around snacking[13] (see Table 1). Children whose parents employed the 'high involvement and supportive' pattern had lower energy-dense snack food intakes compared with children whose parents employed any of the other three patterns (i.e. 'low involvement and indulgent', 'high covert control and rewarding' and 'low covert control and non-rewarding'). Involved and supportive parents are healthy role models, create a supportive home food environment and set clear boundaries regarding snacking.

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Table 1 Four patterns of food parenting practices around snacking (outcome variable)

Pattern	Food parenting practices that particularly characterize the pattern
'High covert control and rewarding'	Low availability and accessibility of snack foods, avoidance of unhealthy modelling, high use of instrumental and emotional feeding
'Low covert control and non-rewarding'	High availability and accessibility of snack foods, low avoidance of unhealthy modelling, low use of instrumental and emotional feeding
'High involvement and supportive'	High use of responsive parenting practices such as encouragement and involving, being a healthy role model, providing a healthy food environment, setting rules, low use of instrumental and emotional feeding
'Low involvement and indulgent'	Low use of responsive parenting practices such as encouragement and involving, not being a healthy role model, having an unhealthy food environment, permissive, low use of instrumental and emotional feeding

Parents exerting covert control try to limit unhealthy food intakes in ways that are not visible for their children, such as by confining the availability of unhealthy foods in their homes. Instrumental and emotional feeding (referred to as 'rewarding' in Table 1) imply that children receive food in exchange for good behaviour or to regulate their emotions.

Intervention developers aiming to promote the use of desirable FPP should know their determinants and, subsequently, fit theoretical methods and practical applications in order to evoke maximal behavioural change[14]. Therefore, research on the precursors of parenting practices is essential. So far, research has mainly linked demographic factors to FPP. Another potential precursor includes the general parenting style of parents: evidence shows that parenting practices, although they are domain specific (e.g. food or physical activity), find their origin in general parenting[15]. Personality serves as a guiding principle of a person's behaviour[16,17]. Consequently, personality might be reflected in general parenting[18] and also relate to parenting practices. Probably, the use of parenting practices also traces back to childhood experiences and is linked with practices used by one's own parents (i.e. the practices imposed during the parent's own childhood). This hypothesis is supported by qualitative research[19] and parallels Belsky's theory on determinants of general parenting[18]. Besides the more distal factors such as general parenting and personality, other potential, more proximal, precursors of parenting practices include the ones specified by socio-cognitive theories of health behaviour. For instance, the Social Cognitive Theory[20] stresses the importance of outcome expectations as well as modelling in shaping behaviour. Parents might favour certain practices by considering their expected effectiveness (i.e. outcome expectations) or by considering practices used by other parents (i.e. vicarious learning or modelling). Self-efficacy is another core concept of the Social Cognitive Theory and should be considered here as well, in view of evidence indicating that parents of obese children had less confidence in managing children's energy balance-related behaviours[21]. In addition to modelling, another form of social influence, subjective norm[22], might be important too. This reflects the degree to which parents find that most people, who are important to them, think they should employ particular parenting practices. Finally, parents' attitude towards the child snacking more in general is expected to determine the type of practices used. Two sets of determinants formed our research framework: predisposing factors (e.g. general parenting, personality) and parental cognitions (e.g. self-efficacy, subjective norms; see Fig. 1). The present paper reports on the relative importance of both sets of determinants in explaining a parent's pattern of FPP and describes the contribution of each single factor to this exploratory model.

Methods

Study design, setting and participants

The full study design has been described elsewhere[13]. In sum, 1985 Dutch parents of 4- to 12-year-old children were recruited nationwide by a research agency (i.e. Flycatcher Internet Research) and invited to fill out an online questionnaire. Participants received credit points for participation that could be exchanged for gifts: completion of the current study yielded approximately 5·56 Euros. Considering the 'Dutch Medical Research Involving Human Subjects Act'[23], the study was exempt from ethical review.

Outcome variable

The outcome variable was the type of FPP pattern. These patterns were derived from a two-step cluster analysis (i.e. hierarchical cluster analysis followed by a non-hierarchical cluster analysis) on twenty-one FPP around snacking[13], including the following constructs: encouragement, rewarding, discussing, providing feedback, involving, educating, healthy modelling, unhealthy modelling avoidance, availability of healthy foods, accessibility of healthy foods, visibility of healthy foods, limited availability of unhealthy foods, limited accessibility of unhealthy foods, structure, meal routines, permissiveness, rules, monitoring, instrumental feeding, emotional feeding and pressure to eat. Four distinct patterns were derived (see Table 1), which were stable according to a cross-validation procedure (i.e. Cohen's κ of 0·97) and characterized as indicated in Table 1[13].

Measures

Predisposing factors

Background variables. Respondents were asked to report their own age, gender, work status, postal code

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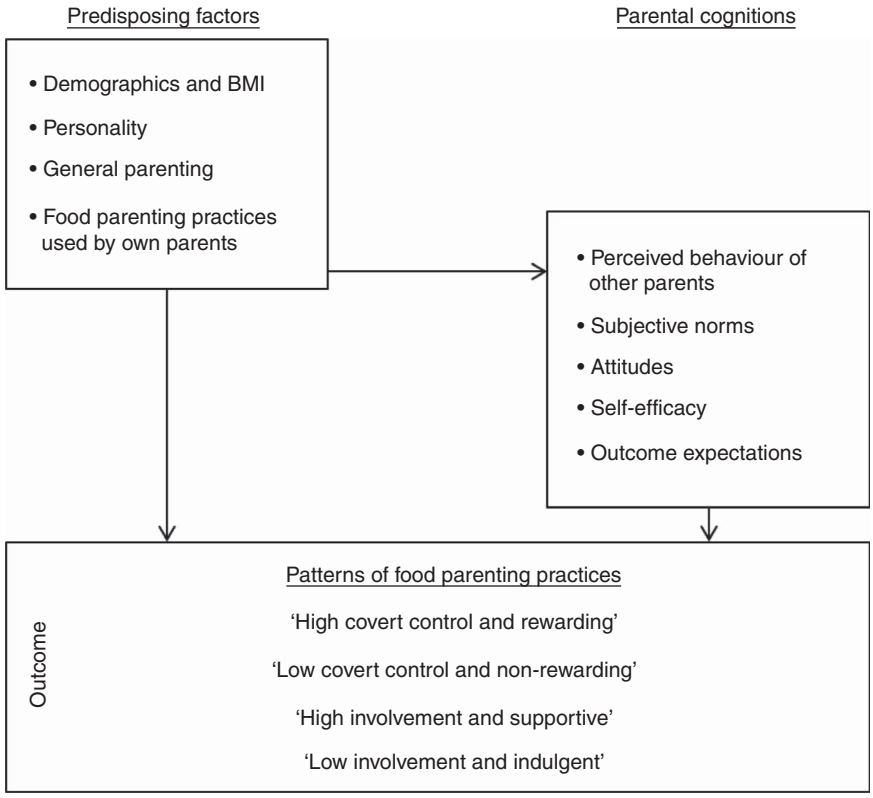

Fig. 1 Research framework to examine the relative importance of predisposing factors and parental cognitions in explaining food parenting practices

(to calculate a factor score for their socio-economic position (SEP); −4 = low; 4 = high[24]), body height and weight (to calculate parental BMI), and their child's age, gender, and body height and weight (to calculate the child's BMI *Z*-score using a reference population[25]). The respondents' educational level and ethnicity were known to the research agency.

Parent's personality. For measuring the personality dimensions of extraversion, conscientiousness, agreeableness, emotional stability and openness to experience, the Dutch thirty-item 'Quick Big Five' (QBF) questionnaire[26] was used. Parents were asked to rate personality traits on a 7-point Likert scale. Cronbach's α values of the five personality dimensions within the current sample were all above 0·84.

General parenting. General parenting was assessed using thirty-two items from the validated Comprehensive Parenting General Parenting Questionnaire (CGPQ)[27] on a 5-point Likert scale, ranging from 1 (= 'strongly disagree') to 5 (= 'strongly agree'). Five general parenting constructs were measured, including nurturance, structure, behavioural control, coercive control and overprotection. Each of these five general parenting constructs consisted of two to four sub-constructs, of which 'physical punishment' (a sub-construct of coercive control) was not included in the current study. One item within structure (i.e. 'I teach my child to keep his/her bedroom clean and orderly') and two items within behavioural control (i.e. 'I make sure I give my child lots of freedom to make mistakes and learn from them' and 'I give my child a lot of freedom to make up his/her own mind') were dropped because of low corrected item–total correlations. The Cronbach's α values of the five general parenting factors ranged from 0·59 to 0·76.

Food parenting practices used by own parents. As an indicator of 'practices used by own parents during childhood', participants were asked to indicate to what extent their own parents used to employ the twenty-one FPP that were used to cluster parents into the four groups. The items were formulated as follows: 'My own parents (caregivers) used to … when I was a child' and had to be answered on a 5-point Likert scale ranging from 1 (= 'strongly disagree') to 5 (= 'strongly agree'), with the possibility to answer 'I don't know'. Exploratory factor analyses (i.e. principal component analysis (PCA)) using oblique rotation were performed to derive factors and create scales using mean scores from the items because they were expected to be multidimensional. 'I don't know' answers were recoded to the middle value (= 3). Eigenvalue >1·0 was used as a criterion to retain factors. Items were dropped for PCA if factor loadings were <0·40 or showed cross-loadings. PCA resulted in five factors referring to parenting practices used by own parents, with moderate to good Cronbach's α except for one (i.e. the scale 'pressure to eat and rewarding'). Example items, reliability statistics and factor loadings of the scales used to predict parenting practices are presented in Table 2.

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Table 2 Scales used to predict food parenting practices

Factor	Example item	Final no. of items	CITC (range)	Factor loadings (range)	Cronbach's α
Predisposing factors					
Personality† (QBF)[25]	'Please indicate to what degree the following traits apply to you'				
Extraversion	Talkative	6	0·66–0·78	NA	0·90
Conscientiousness	Neat	6	0·62–0·83	NA	0·90
Agreeableness	Helpful	6	0·60–0·74	NA	0·88
Emotional stability	Nervous	6	0·45–0·74	NA	0·84
Openness to experience	Creative	6	0·51–0·71	NA	0·84
General parenting‡ (CGPQ)[26]	'How much do you agree or disagree with the following statements?'				
Nurturance	'I know exactly when my child has difficulty with something'	8	0·41–0·56	NA	0·76
Structure	'When I tell my child I will do something, I do it'	7	0·27–0·44	NA	0·59
Behavioural control	'I make sure that my child understands what I expect of him/her'	6	0·28–0·46	NA	0·65
Coercive control	'I make my child feel guilty when he/she does not meet my expectations'	4	0·29–0·41	NA	0·58
Overprotection	'Every free minute I have I spend with my child'	4	0·35–0·50	NA	0·65
FPP used by own parents‡	'My own parents (caregivers) used to … when I was a child'				
Covert unhealthy food control	'… limit the availability of EDSF in the house for me'	4	NA	−0·42 to −0·79	0·59
Healthy food availability, rules, encouragement	'… make sure healthy foods were available at home for me'	7	NA	0·47–0·89	0·87
Instrumental and emotional feeding	'… give me EDSF to reward me for good behaviour'	2	NA	0·82–0·87	0·66
Meal practices	'… involve me in food-related activities'	4	NA	0·45–0·84	0·72
Pressure to eat and rewarding	'… insist that I eat or finished a food item'	2	NA	−0·53–0·63	NA¶
Parental cognitions					
Perceived behaviour of other parents‡	'Most parents among my acquaintances …'				
Covert unhealthy food control	'… consciously refrain from eating EDSF when their child is around'	4	NA	0·53–0·73	0·69
Healthy food availability, rules, encouragement	'… make sure healthy foods are visible for their child'	9	NA	0·46–0·85	0·87
Instrumental and emotional feeding	'… give their child EDSF to make him/her feel better'	3	NA	0·65–0·75	0·59
Meal practices	'… involve their child in food-related activities'	3	NA	0·73–0·80	0·76
Subjective norms‡	'Most people, who are important to me, think I should …'				
Covert unhealthy food control	'… consciously refrain from eating EDSF when my child is around'	4	NA	−0·56 to −0·74	0·79
Healthy food availability, rules, encouragement	'… have rules for my child about eating EDSF'	10	NA	0·40–0·85	0·92
Instrumental and emotional feeding	'… give my child EDSF to make him/her feel better'	3	NA	0·73–0·78	0·63
Meal practices	'… teach my child things about food'	4	NA	0·70–0·85	0·82
Attitude‡	'If my child eats a lot of EDSF …'				
Benefits of child's EDSF intake	'… he/she will think I am a good father/mother'	5	NA	0·63–0·80	0·80
Negative effects of child's EDSF intake	'… he/she will be less able to concentrate'	5	NA	0·53–0·69	0·63
Self-efficacy‡,§	'I think it is difficult to …'				
Covert unhealthy food control and rules	'… limit the availability of EDSF in the house for my child'	7	NA	0·43–0·78	0·81
Healthy food availability and encouragement	'… make sure healthy foods are available at home for my child'	5	NA	−0·54 to −0·85	0·85
Meal practices	'… ensure healthy mealtime habits'	4	NA	0·57–0·79	0·72
Permissiveness and pressure	'… insist that my child eats or finishes a food item'	3	NA	0·45–0·75	0·50
Outcome expectations§,‖	'If I …, my child will'				
Covert unhealthy food control	'… limit the accessibility of EDSF in the house for my child'	2	NA	0·86–0·90	0·77
Healthy food availability and encouragement	'… make sure healthy foods are accessible at home for my child'	6	NA	0·66–0·85	0·92
Instrumental and emotional feeding	'… give my child EDSF to reward me for good behaviour'	3	NA	0·61–0·82	0·66
Meal practices	'… teach my child things about food'	4	NA	0·60–0·81	0·80
Pressure to eat, rules, structure and feedback	'… respond to my child 's eating behaviour by providing him/her with feedback'	4	NA	0·52–0·69	0·58

CITC, corrected item–total correlation; QBF, 'Quick Big Five questionnaire'; CGPQ, Comprehensive Parenting General Parenting Questionnaire; FPP, food parenting practice; EDSF, energy-dense snack food; NA, not assessed/not applicable.
†1 = 'not at all applicable to me'; 7 = 'completely applicable to me'.
‡1 = 'strongly disagree'; 5 = 'strongly agree'.
§Scale scores reverse coded; higher scores indicate a higher self-efficacy/positive outcome expectations (i.e. lower child snack food intake).
‖1 = 'eat far less snack foods'; 5 = 'eat a lot more snack foods'.
¶Scale not included in further analyses because of a negative average covariance among items.

Parental cognitions

Perceived behaviour of other parents and subjective norms. Items used to measure social influences (i.e. perceived behaviour of other parents, subjective norms) also referred to the twenty-one individual FPP around snacking and entered a PCA in a similar fashion. 'Perceived behaviour of other parents' was assessed using the question: 'Most parents …' followed by the twenty-one individual FPP. 'Subjective norms' were assessed using items starting with: 'Most people, who are important to me, think I should …'. All questions were accompanied with a 5-point Likert scale ranging from 1 (= 'strongly disagree') to 5 (='strongly agree') and a possibility to answer 'I don't know'.

Attitude. Qualitative interviews with fifteen parents from the target population informed the development of the attitude items. Two sets of five items were formulated to assess parents' attitude towards benefits (Cronbach's $\alpha = 0{\cdot}80$) and negative effects (Cronbach's $\alpha = 0{\cdot}63$) of a high snack intake by their child. Attitude items were rated on a 5-point Likert-scale ranging from 'strongly disagree' to 'strongly agree' and loaded on two factors, thereby confirming the attitude dichotomy.

Self-efficacy and outcome expectations. In line with items used to measures social influences (i.e. perceived behaviour of other parents, subjective norms), self-efficacy and outcome expectations items referred to the twenty-one FPP and entered the PCA. Self-efficacy items started with the following phrase: 'I think it is difficult to …' and were also rated on a 5-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. Because self-efficacy tends to be of minor importance with regard to instrumental feeding and emotional feeding, we decided not to measure self-efficacy for both constructs. Outcome expectations were assessed using the statement: 'If I …, my child will' and a 5-point scale ranging from 1 (= 'eat far less snack foods') to 5 (= 'eat a lot more snack foods'). Four self-efficacy factors (Cronbach's α ranging from 0·50 to 0·81) and five outcome expectation factors (Cronbach's α ranging from 0·58 to 0·71) were derived. Self-efficacy and outcome expectations were reverse recoded so that higher scores indicate a higher self-efficacy and positive outcome expectations (i.e. lower child snack food intake), respectively.

Statistical analysis

To diagnose multicollinearity, correlations between predictor variables were explored and variance inflation factors were calculated through a linear regression analysis with all predictors as independent variables. A cut-off value of >0·8 for correlations[28] and >10 for variance inflation factors[29] was applied for multicollinearity. To predict the patterns of FPP, multinomial logistic regression analyses were run using the 'high involvement and supportive' pattern as the reference category. Each predictor was tested individually and in a total model by using backward elimination. Subsequently, significant predictors in the final model were entered into two separate multinomial logistic regression analyses (i.e. one including predisposing factors and one including parental cognitions) to investigate the importance of both sets of predictors by assessing Nagelkerke R^2 values. All analyses were conducted using the statistical software package IBM SPSS Statistics version 20. P values <0·05 were considered statistically significant.

Results

Sample

The sample consisted of 888 parents with a mean age of 40·6 (SD 5·8) years. Of the sample, 65·2 % were female; 45·3 % had an intermediate and 43·6 % had a high educational level. Most parents were of Dutch ethnicity (91·0 %) and were employed (79·3 %). Their mean BMI was 25·2 (SD 4·2) kg/m^2 and the mean SEP score was 0·1 (SD 1·2). Regarding BMI category, 54·2 % had a healthy weight (i.e. 18·5–24·9 kg/m^2) and 45·2 % were overweight (i.e. ≥25·0 kg/m^2). The mean age of the children was 7·9 (SD 2·6) years with half of them being female (49·7 %). Their mean BMI Z-score was 0·19 (SD 1·4), with 73·2 % being healthy weight and 14·6 % overweight according to Barlow's cut-off points[30].

Predictors of patterns of food parenting practices

Multicollinearities between the scales were not found. Results from the multinomial logistic regression analysis showed that after backward elimination, nineteen factors had a statistically significant contribution to the final model (Nagelkerke $R^2 = 0{\cdot}63$; Table 3).

All parental cognitions remained in the model, except for the factors measuring perceived behaviour of other parents, one out of four factors measuring subjective norms, and two out of five factors measuring outcome expectations. Overall, self-efficacy and outcome expectations were among the strongest predictors: parents were more likely to be highly involved and supportive in food parenting, rather than employ any other pattern, if they had a high self-efficacy and more positive outcome expectations regarding the 'availability of healthy food and encouragement' and more positive outcome expectations regarding 'meal practices'.

Concerning the predisposing factors, in particular nurturance most strongly predicted food parenting clusters. Parents scoring high on nurturance were less likely to have the 'low involvement and indulgent' and the 'high covert control and rewarding' pattern, rather than having the 'high involvement and supportive' pattern. From the background variables, child age and SEP remained significant explanatory factors of cluster membership in the final model: higher-SEP parents were more likely to have the 'low involvement and indulgent' pattern, rather than the opposite one (i.e. 'high involvement and supportive').

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Table 3 Predictors of food parenting practice patterns around snacking among parents of children aged 4–12 years, the Netherlands (October–November 2014): OR and *P* values from the univariate and backward multinomial logistic regression analyses

Reference category = high involvement and supportive	High covert control and rewarding	Low covert control and non-rewarding	Low involvement and indulgent	High covert control and rewarding	Low covert control and non-rewarding	Low involvement and indulgent
	Univariate (*n* 871 to 888)			Backward procedure (*n* 864)		
Nagelkerke R^2		NA			0·63	
Predisposing factors						
Background variables						
Parent age	0·99	1·03	1·04*			
Parent gender†	1·02	0·75	1·47			
Parent BMI	0·98	0·99	1·05*			
Parent ethnicity‡	1·03	1·85	0·95			
Parent SEP	1·07	0·96	1·26*	1·01	0·97	1·34*
Parent educational level low§	1·84	1·78	2·33*			
Parent educational level intermediate§	1·25	1·12	1·25			
Parent work status‖	0·81	0·97	1·37			
Child gender†	0·82	0·85	0·59*			
Child age	0·91*	1·13*	1·13*	0·86***	1·04	1·07*
Child BMI *Z*-score	1·13	0·95	1·23*			
Parent's personality						
Extraversion	0·95***	0·98	0·93***			
Conscientiousness	0·97*	0·97	0·91***			
Agreeableness	0·86***	0·90***	0·77***			
Emotional stability	0·96*	0·99	0·94***			
Openness to experience	0·94***	0·93***	0·90***	0·97	0·95	0·95
General parenting						
Nurturance	0·17***	0·35***	0·04***	0·51*	0·69	0·22***
Structure	0·29***	0·95	0·12***			
Behavioural control	0·61*	0·57**	0·20***			
Overprotection	1·04	0·74*	0·70*			
Coercive control	1·50**	0·87	1·53**			
FPP used by own parents						
Covert unhealthy food control	0·93	0·34***	0·51***	1·37	0·54***	0·73
Healthy food availability, rules, encouragement	0·47***	0·42***	0·26***	0·58*	0·72	0·57*
Instrumental and emotional feeding	1·43***	0·58***	1·12	1·08	0·65**	0·71
Meal practices	0·57***	0·50***	0·30***	1·20	0·77	0·69
Parental cognitions						
Perceived behaviour of other parents						
Covert unhealthy food control	1·33	0·53***	0·73			
Healthy food availability, rules, encouragement	0·81	0·52***	0·38***			
Instrumental and emotional feeding	1·17	0·64**	0·75			
Meal practices	0·78	0·66*	0·43***			
Subjective norms						
Covert unhealthy food control	0·96	0·33***	0·54***			
Healthy food availability, rules, encouragement	0·58***	0·33***	0·32***			
Instrumental and emotional feeding	1·52**	0·43***	1·10	0·81	0·45***	0·76
Meal practices	0·52***	0·36***	0·39***	0·47***	0·67*	0·46**
Attitude						
Benefits of child's EDSF intake	3·23***	1·20	4·52***	1·98***	1·13*	2·29**
Negative effects of child's EDSF intake	0·52***	0·37***	0·20***	0·94	0·75	0·34***
Self-efficacy						
Covert unhealthy food control and rules	0·22***	0·64*	0·11***	0·65	0·88	0·29***
Healthy food availability and encouragement	0·15***	0·36***	0·09***	0·23***	0·31***	0·15***
Meal practices	0·31***	0·67*	0·16***	0·61*	0·80	0·32***
Permissiveness and pressure	0·53***	0·91	0·54***	1·34	1·16	2·62***
Outcome expectations						
Covert unhealthy food control	0·73*	0·18***	0·40***	0·93	0·31***	0·69
Healthy food availability and encouragement	0·35***	0·14***	0·09***	0·39***	0·27***	0·14***
Instrumental- and emotional feeding	1·84***	1·28	3·40***	1·32	0·63*	1·68
Meal practices	0·28***	0·14***	0·07***			
Pressure to eat, rules, structure and feedback	0·44***	0·28***	0·20***			

SEP, socio-economic position; FPP, food parenting practice; EDSF, energy-dense snack food; NA, not assessed/not applicable.
*$P < 0·05$; **$P < 0·01$; ***$P < 0·001$.
†1 = 'male'; 2 = 'female'.
‡1 = 'Dutch'; 2 = 'non-Dutch'.
§1 = 'low'; 2 = 'intermediate'; 3 = 'high'.
‖1 = 'employed'; 2 = 'non-employed'.

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Parents of younger children were more likely to covertly control unhealthy foods and reward, rather than being highly involved and supportive, and parents of older children were more likely to have the 'low involvement and indulgent' pattern, rather than being highly involved and supportive. Parents' current use of FPP also appeared to be related to the ones used by their own parents. From those factors, the strongest predictor was the former use of covert unhealthy food control: if their own parents highly used covert unhealthy food control, parents were more likely to be highly involved and supportive, rather than being member of the 'low covert control and non-rewarding' cluster. The two separate models, one including predisposing factors and one including parental cognitions from the final model, yielded Nagelkerke R^2 values of 0·37 and 0·55, respectively.

Discussion

In a previous study, we identified four different categories of Dutch parents with patterns of FPP[13]. The current study aimed to explain membership of these patterns and found that parental cognitions were generally stronger predictors than predisposing factors, which included, among others, personality and general parenting. The greatest effect sizes were found among comparisons between the 'high involvement and supportive' cluster and its opposite, the 'low involvement and indulgent' cluster. Self-efficacy and outcome expectations regarding 'healthy food availability and encouragement' were the two factors that best discriminated highly involved and supportive parents from all three other types of parents. Parents were more likely to be highly involved and supportive if they had a high self-efficacy and more positive outcome expectations regarding making healthy foods available, accessible and visible, and regarding encouraging and modelling healthy food intake. These results contribute to the expanding research focus[31–35] on the role of self-efficacy in parents' energy balance-related parenting practices. Consequently, the increased attention of interventions to address self-efficacy seems to be justified[36,37]. In addition, the results demonstrate that parents might decide not to use some parenting practices because they believe they are not effective in lowering children's energy-dense snack food intake. In contrast to subjective norms, perceived behaviour of other parents was not predictive for parents' use of parenting practices, probably because of the moderate-sized intercorrelations between these factors. It has previously been highlighted that parents misperceive other parents' acceptance of children's frequent snacking[38], suggesting that parents' subjective norms regarding the use of parenting practices around snacking might be a misperception of the actual norm too. This hypothesis might be addressed in future research. Only a few studies have used theories of health behaviour to predict the use of FPP. For instance, Theory of Planned Behaviour constructs (i.e. attitudes, social norms, perceived behavioural control and intention) and outcome expectations were significant predictors in one study, which specifically focused on parents' tracking behaviour of snack food intake[39]. Another line of research focused on predicting the use of vegetable parenting practices using a model that included, among others, Theory of Planned Behaviour and Self Determination Theory constructs[40]. Habits most strongly predicted effective and ineffective parenting practices related to vegetable intake[41,42]. Since the target populations and type of FPP were different across these studies and the current research, the results cannot easily be merged to indicate the most important predictors.

Besides parental cognitions, the general parenting factor nurturance was found to be a significant and strong predictor: parents were more likely to be highly involved and supportive if they demonstrated high levels of nurturance. It was also the only general parenting factor that was a significant predictor in the full model and had a very large effect size in the univariate model. Nurturance mainly represents the extent to which parents are responsive to their children's needs, are involved with and spend time with their child, and is also referred to as 'responsiveness' or 'involvement'[11,27]. As such, nurturance may transfer from general parenting to involvement and supportiveness in food parenting.

The finding that parents of older children were less likely to covertly control and reward than those of younger children is consistent with earlier studies reporting on negative associations between child's age and instrumental and emotional feeding[43,44], but different from a study finding no link between age and covert snack control[45]. We found older parents to be more likely employing the 'low involvement and indulgent' pattern, which is reasonable given that parental involvement and monitoring tend to decline from childhood to adolescence[46]. Lower-SEP parents were more likely to be highly involved and supportive, rather than being in the 'low involvement and indulgent' cluster, which is promising. Regarding the remaining predisposing factors, personality was of minor importance in predicting FPP, but part of the practices used by own parents did have a link with the food parenting patterns. More research is necessary to establish the significance of how parents were parented themselves in determining current parenting practices around energy balance-related behaviours.

Implications for research and practice

Based on the current study, planners of health promotion programmes aiming to reduce children's snack intake should focus on parental cognitions towards food parenting. Most importantly, self-efficacy and outcome expectations should be targeted. Although parental cognitions tend to be proximal to food parenting, interventions might be targeted

at more fundamental and distal factors such as nurturance as well. Although we cannot draw conclusions on the mediation of general parenting via cognitions to parenting practices, Jago and colleagues recently found evidence for such a pathway[35]. Consequently, more sustainable change in parenting practices might be expected if change is achieved in general parenting[47]. Non-modifiable predictors including the child's age, parent's age and practices used by parents' own parents should be taken into account when developing interventions.

Strengths and limitations

A strength of the current study included the use of a broad set of potentially important factors. To the best of our knowledge, the present study is the first using a combination of contextual and intrapersonal factors in the prediction of food-related parenting practices. Parents were asked to reflect on their own parents' behaviours as well, which is an understudied perspective in the literature. It should be noted, however, that the self-report measures might have biased the results. There was one predictor that showed a different relationship in the univariate (i.e. OR <1) compared with the backward procedure (i.e. OR >1). Possibly, the low internal consistency of the scale concerned (i.e. 'self-efficacy towards permissiveness and pressure') caused this inconsistent result. The low internal consistency of five other scales, with Cronbach's α ranging from 0·50 to 0·59, needs to be considered as well. Finally, the study was cross-sectional, implying that no causal inferences could be drawn. More specifically, parental cognitions such as self-efficacy or outcome expectations might have been constructed *ad hoc* because none existed or were aligned with (current) behaviour by parents, resulting in overestimated associations between cognitions and parenting practices[48]. In addition, we cannot draw conclusions on the causal direction between general parenting and FPP.

Conclusion

The present study showed that parental cognitions are important factors in explaining the use of FPP around snacking. It also found that the general parenting factor nurturance is a strong predictor variable to particularly distinguish highly involved parents from parents employing a pattern of low involvement. These results suggest that intervention developers should take measures aimed at increasing self-efficacy and educating parents about what constitute effective and ineffective parenting practices. Potentially, focusing on general parenting factors such as nurturance is necessary.

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