Appetite xxx (2009) xxx–xxx

Contents lists available at ScienceDirect

Appetite

journal homepage: www.elsevier.com/locate/appet

Research report

Maternal psychosocial predictors of controlling parental feeding styles and practices

Sarah Mitchell [a,b,*], Leah Brennan [a,c], Louise Hayes [b,1], Cara L. Miles [a,d]

[a] Parenting Research Centre, Level 5, 232 Victoria Street, East Melbourne, Victoria 3002, Australia
[b] School of Behavioural and Social Sciences and Humanities, University of Ballarat, Australia
[c] Division of Exercise Science, School of Medical Sciences, RMIT University, Australia
[d] Division of Psychology, School of Health Sciences, RMIT University, Australia

ARTICLE INFO

Article history:
Received 1 December 2008
Received in revised form 31 July 2009
Accepted 3 August 2009

Keywords:
Children
Diet
Maternal feeding
Control
Parenting efficacy
Parenting satisfaction
Psychological health

ABSTRACT

The aim of the current study was to explore the relative contribution of parental depression, anxiety and stress and parenting satisfaction and efficacy to the explanation of variance in controlling parental feeding styles and practices. The sample comprised 124 mothers (M = 36.80 years, SD = 4.62 years) who reported on both themselves and a selected child (59 male, 65 female; M = 6.46 years, SD = .95 years). Mothers completed several questionnaires examining demographic information, parental feeding styles, parental feeding practices, parental depression, anxiety and stress and parenting satisfaction and efficacy. Parenting satisfaction contributed significantly to the prediction of the parental feeding practice pressure to eat. Parenting satisfaction and parental anxiety contributed significantly to the prediction of the parental feeding practice restriction. The results of this study provide important insight into maternal characteristics associated with the use of controlling parental feeding styles and practices.

Introduction

Parents play an important role in the development of children's eating habits through the parental feeding styles and practices they adopt (Ventura & Birch, 2008). A number of controlling parental feeding styles and practices have been linked to unhealthy eating styles, diet and weight in children (Clark, Goyder, Bissell, Blank, & Peters, 2007; Ventura & Birch, 2008). Identifying parental characteristics associated with the use of controlling parental feeding styles and practices will improve understanding of parental factors associated with the adoption of such methods and assist in the development of interventions to modify them.

Parental feeding styles are the overarching feeding approaches a parent adopts consistently across all parental feeding situations (Ventura & Birch, 2008). Parental feeding practices are the specific strategies that parents use in an attempt to maintain or modify their child's eating style and diet; these practices may vary between contexts. For example a mother may use different parental feeding practices for each of her children, or change practices as her child grows while retaining the same general parental feeding style over time and situations.

Controlling parental feeding styles and practices have been linked with a range of unhealthy eating styles (e.g. eating in the absence of hunger; Fisher & Birch, 2000; Fisher & Birch, 2002), dietary patterns (e.g. decreased vegetable consumption; Galloway, Fiorito, Lee, & Birch, 2005; Patrick, Nicklas, Hughes, & Morales, 2005) and weight in children (Francis, Hofer, & Birch, 2001; Lee, Mitchell, Smiciklas-Wright, & Birch, 2001). While the majority of studies indicate that controlling parental feeding styles are associated with negative child outcomes, some studies have reported no relationship (Clark et al., 2007; Montgomery, Jackson, Kelly, & Reilly, 2006) and others have reported that the parental feeding practice restriction is associated with lower weight in children (Farrow & Blissett, 2008). More recently, it has been suggested that control itself does not lead to poor diet outcomes, rather it is the method of control that determines outcomes (Brown, Ogden, Vögele, & Gibson, 2008; Ogden, Reynolds, & Smith, 2006). For instance covert control has been linked with the consumption of fewer unhealthy snacks, increased fruit and vegetable consumption and lower levels of food neophobia in children while overt control has been linked with the consumption of more healthy snacks and increased fruit and vegetable consumption in children (Brown et al., 2008; Ogden et al., 2006).

* Corresponding author at: Parenting Research Centre, Parenting for Health and Wellbeing, Level 5, 232 Victoria Street, East Melbourne, Victoria 3002, Australia.
E-mail addresses: smitchell@parentingrc.org.au (S. Mitchell), lbrennan@parentingrc.org.au (L. Brennan), louisehayes@vtown.com.au (L. Hayes), cara.miles@student.rmit.edu.au (C.L. Miles).
[1] Parenting Research Centre, Level 5, 232 Victoria Street, East Melbourne, Victoria 3002, Australia.

0195-6663/$ – see front matter © 2009 Published by Elsevier Ltd.
doi:10.1016/j.appet.2009.08.001

A number of parental factors are associated with parental feeding practices. Parental perception of a child's weight (Birch et al., 2001) and concern about child weight (Francis et al., 2001) are associated with the use of controlling parental feeding practices. Parental psychological health has also been linked to controlling parental feeding styles and practices. For instance, higher levels of psychological distress (Blissett & Farrow, 2007), maternal anxious psychopathology (Farrow & Blissett, 2005) and parental depression, anxiety and stress (Hurley, Black, Papas, & Caufield, 2008) have been shown to be associated with restriction in infants. One study failed to demonstrate an association between maternal depression and the use of restriction or pressure to eat in infants (Farrow & Blissett, 2005). However, in one of the only studies looking at children aged 5 years, higher levels of parental depression was linked with restriction and pressure to eat (Francis et al., 2001).

These findings are generally consistent with previous research linking parental psychological health with ineffective parent behaviours not specific to the feeding context. Parental psychological health has been linked to hostile and coercive parenting behaviours (Lovejoy, Graczyk, O'Hare, & Neuman, 2000) and higher levels of parental control (van der Bruggen, Stams, & Bögels, 2008). Low levels of parenting efficacy (Hill & Bush, 2001) and parenting satisfaction (Simons, Beaman, Conger, & Chao, 1993) are also associated with the use of ineffective and controlling parenting practices in the general parenting literature. These findings suggest that parenting satisfaction and efficacy may be important in parental feeding, however they have not previously been explored in the feeding context.

Given the potential negative child outcomes associated with controlling parental feeding styles and practices, and the recent increase in interventions to improve parental feeding styles and practices, research is needed to identify parental factors related to the use of such methods. The aim of the current study was to explore the relative contribution of parental depression, anxiety and stress and parenting satisfaction and efficacy to the explanation of variance in controlling parental feeding styles and practices.

Methods

Participants

The sample comprised mothers ($N = 124$) recruited from a larger study investigating children's lunchbox contents (Miles, Brennan, Mitchell, & Matthews, 2009). To partake in the study, participants were required to be over the age of 18 years, have a child attending primary school and have an understanding of spoken and written English. One hundred and seventy-six questionnaire packages were distributed and 124 were returned (response rate 70.5%). Mothers ages ranged from 26 to 47 years ($M = 36.80$ years, $SD = 4.62$ years). The majority of mothers were of Australian ethnicity (89%) and just over a third (37%) had attained a territory qualification. Mothers providing height and weight information were classified as underweight (2%), healthy weight (53%), overweight (33%) and obese (12%). BMI category could not be calculated for 6% of mothers due to non-reporting of height. For the child related variables, mothers were asked to report on one of their children who were in one of the first 3 years of school. The child sample consisted of 59 male and 65 female children aged 5–8 years ($M = 6.46$ years, $SD = 0.95$ years). BMI categories could not be calculated for 26% of children due to non-reporting of height (23%) and weight (5%). Of those for whom BMI categories could be calculated, the International Obesity Task Force criteria (Cole, Bellizzi, Flegal, & Dietz, 2000; Cole, Flegal, Nicholls, & Jackson, 2007) were used to categorise children as underweight (18%), healthy weight (64%), overweight (12.4%) or obese (5.6%). Compared to recent National Statistics (Commonwealth Scientific Industrial Research Organisation, 2008), the category *underweight* is overrepresented and the category *healthy weight* is underrepresented in the current sample.

Materials

Participants completed a questionnaire package which included the following measures:

Demographic Background Data Questionnaire. This questionnaire was based on the demographic survey used by the Parenting Research Centre and consists of 32 items measuring parental and child demographic information such as parental age, gender, country of birth, height, weight, relationship to the child (e.g. parent, step-parent), highest level of education, current employment status and child's age, gender, height and weight.

The Caregiver's Feeding Styles Questionnaire (*CFSQ*; Hughes, Power, Fisher, Mueller, & Nicklas, 2005). The CFSQ is a 24-item questionnaire which assesses parental feeding styles; two feeding styles were included in this study, authoritarian parental feeding style (characterised by a range of controlling and unresponsive behaviours parents adopt in the feeding context such as punishing, coercion and rejection) (e.g. "How often do you physically struggle with your child to get him/her to eat?" $\alpha = .86$) and authoritative parental feeding style (characterised by parental involvement, reasoning and structure; e.g. "How often do you allow your child to choose appropriate foods?" $\alpha = .71$; Hughes et al., 2005). Items were scored according to criteria presented by Patrick et al. (2005) whereby participants receive a separate score for authoritarian and authoritative feeding style. Each item is rated along a 5-point Likert scale ranging from '1' = '*Never*' to '5' = '*Always*' and higher scores indicate higher levels of each subscale.

The Child Feeding Questionnaire (*CFQ*; Birch et al., 2001). The CFQ is a 31-item measure assessing parents' attitudes, beliefs and practices related to parental feeding. The questionnaire consists of 7 subscales; two controlling parental feeding practices subscales were used in this study, Pressure to Eat, the degree to which a parent pressures a child to increase their consumption of foods (e.g. "I have to be especially careful my child eats enough" $\alpha = .70$) and Restriction (the degree to which a parent limits a child's access to foods; e.g. "I have to be sure that my child does not eat too many sweets [candy, ice cream, cake or pastries]" $\alpha = .73$; Birch et al., 2001). Each item is rated along a 5-point Likert scale with higher scores indicating higher levels of each subscale.

The Overt/Covert Control Scale (Ogden et al., 2006). The Overt/Covert Control Scale consists of 10 items measuring parents' levels of overt and covert control over their child's eating behaviour. The questionnaire consists of 2 subscales; overt control, limiting consumption of 'unhealthy' foods in a manner than can be perceived by the child (e.g. "How often are you firm about what your child should eat?" $\alpha = .71$) and covert control, limiting the consumption of 'unhealthy' foods in such a way that the child is unaware of the restriction (e.g. "How often do you avoid buying sweets and crisps and bringing them into the house?" $\alpha = .79$). Each item is rated along a 5-point Likert scale ranging from '1' = '*Never*' to '5' = '*Always*'. Participants receive a separate score for each of the subscales; higher scores indicate higher levels of overt and covert control.

Parenting Sense of Competence Scale (*PSOC*; Johnston & Mash, 1989). The PSOC is a 16-item measure of parenting self-esteem. The measure consists of two subscales; efficacy ($\alpha = .76$) and satisfaction ($\alpha = .75$; Johnston & Mash, 1989). Each item is rated along a 6-point Likert scale with responses ranging from 'SA' = '*Strongly agree*' to 'SD' = '*Strongly disagree*'. Participants receive a separate score for each of the subscales; higher scores indicate higher levels of efficacy and satisfaction.

Please cite this article in press as: Mitchell, S., et al. Maternal psychosocial predictors of controlling parental feeding styles and practices. *Appetite* (2009), doi:10.1016/j.appet.2009.08.001

Depression Anxiety Stress Scale 21-item (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 is an 21-item measure of depression, anxiety and stress. The measure consists of 3 subscales: depression (α = .94), anxiety (α = .87) and stress (α = .91; Antony, Bieling, Cox, Enns, & Swinson, 1998). The DASS-21 has good test–retest reliability (r = .71–.81; Brown, Chorpita, Korotitsch, & Barlow, 1997). Each item is rated along a 4-point Likert scale with responses ranging from '0' = '*Did not apply to me at all*' to '3' = '*Applied to me very much, or most of the time*'. Participants receive a separate score for each of the subscales; higher scores indicate higher levels of depression, anxiety and stress.

Procedure

Approval for this study was obtained from the relevant Human Research Ethics Committees. Five large schools participated in the larger study and parents were recruited through a variety of methods at their child's school including advertisements in newsletters and posters placed around the school. Parents with children in the first 3 years of school were invited to complete a questionnaire booklet which consisted of the measures used in the current study in addition to other assessments forming part of the larger study. Parents returned the questionnaire booklet and consent form using a replied paid envelope.

Statistical analysis

All variables were examined for accuracy of data entry and missing values. Case means were used to impute for missing data for variables with less than 10% of missing data. Review of histograms and normal Q-Q and detrended Q-Q plots indicated non-normality for a number of variables and these were subsequently transformed. Parent BMI demonstrated three extreme outliers (greater than 3 standard deviations) and child BMI *Z*-score demonstrated two extreme outliers, all were deemed to be erroneous and were replaced with the mean ± 3 standard deviations as appropriate. Mahalanobis distance was calculated to assess for multivariate outliers. Two cases obtained a score significantly higher than critical value, $\chi^2(5) = 20.52$, $p < .001$, and were removed from regression analyses. Comparison to criteria presented by Belsley, Kuh, and Welsch (1980) indicated an absence of multicollinearity. Pearson's product moment and point-biserial correlations were used to investigate relationships between parental feeding styles and practices and parental depression, anxiety and stress and parenting satisfaction and efficacy. A series of multiple regressions were also undertaken to ascertain maternal psychosocial predictors of parental feeding styles and practices.

Table 1
Descriptive statistics for child BMI *Z*-score, parental feeding styles and practices and maternal psychosocial variables.

	Range	*N*	Min	Max	*M*	*SD*
Child BMI *Z*-score	N/A	89	−4.14	3.13	0.09	1.49
CFSQ						
Authoritarian[a]	1–5	122	1.00	4.25	2.06	0.58
Authoritative	1–5	123	1.86	4.14	2.96	0.45
CFQ						
Restriction	1–5	124	1.00	5.00	3.10	0.88
Pressure to eat[a]	1–5	123	1.00	5.00	2.61	0.93
Overt/Covert Scale						
Covert control	1–5	121	1.00	5.00	2.97	0.90
Overt control	1–5	120	1.00	5.00	3.80	0.72
DASS-21						
Depression	0–21	122	0.00	12.00	1.88	2.55
Anxiety	0–21	122	0.00	8.00	1.43	1.82
Stress	0–21	122	0.00	14.00	3.80	3.40
PSOC						
Satisfaction	1–6	122	1.11	6.00	4.45	0.90
Efficacy	1–6	122	2.14	6.00	4.47	0.79

[a] Transformed variables and untransformed means and standard deviations provided.

Results

Descriptive statistics for parental feeding styles and practices, parental depression, anxiety and stress and parenting satisfaction and efficacy are presented in Table 1. According to the classification offered by Lovibond and Lovibond (1995) the mean scores for the depression, anxiety and stress subscales fell in the "normal" range indicating that on average, mothers were not experiencing clinical levels of depression, anxiety or stress. The PSOC-satisfaction subscale $t(121) = 12.37$, $p < .001$ and efficacy subscale $t(121) = 17.48$, $p < .001$, were significantly higher than that of other studies using the PSOC in community samples (Rogers & Matthews, 2004).

Pearson's product moment correlations exploring the relationship between parental feeding styles and practices and parent BMI revealed no significant relationships. Pearson's product moment correlations investigating the interrelationships between the hypothesised variables are presented in Table 2. Authoritarian parental feeding style was negatively correlated with parenting satisfaction and positively correlated with parental depression, anxiety and stress. Authoritative parental feeding style was positively correlated with parenting efficacy. Restriction was negatively correlated with parenting satisfaction and efficacy and

Table 2
Correlations between parental feeding styles and practices and maternal psychosocial variables.

	1. Authoritarian	2. Authoritative	3. Restriction	4. Pressure to eat[a]	5. Overt control	6. Covert control	7. Depression	8. Anxiety	9. Stress	10. Satisfaction	11. Efficacy
1. Authoritarian[a]	–										
2. Authoritative	.47**	–									
3. Restriction	.36**	.16	–								
4. Pressure to eat[a]	.56**	.20*	.31**	–							
5. Overt control	.07	.04	.25**	.28**	–						
6. Covert control	−.05	.02	.25**	.01	.40**	–					
7. Depression	.27**	−.01	.19*	.24**	−.09	.05	–				
8. Anxiety	.31**	.09	.29**	.26**	.03	.14	.55**	–			
9. Stress	.31**	.03	.27**	.20*	−.02	.17	.70**	.59**	–		
10. Satisfaction	−.28**	−.11	−.25**	−.32**	.10	.07	−.41**	−.28**	−.46**	–	
11. Efficacy	−.12	.21*	−.20*	−.03	.09	−.15	−.26**	−.15	−.27**	.27**	–

[a] Square root transformed.
* $p < .05$.
** $p < .001$.

Please cite this article in press as: Mitchell, S., et al. Maternal psychosocial predictors of controlling parental feeding styles and practices. *Appetite* (2009), doi:10.1016/j.appet.2009.08.001

Table 3
Predictors of parental feeding styles and practices.

Outcome	Model summary					Coefficients			
	R	R^2	Adj. R^2	*df*	*p*-Value	β	*B*	*SE B*	*p*-Value
Authoritarian[a]	.83	.15	.11	5, 112	.00				
Depression						0.00	.00	.01	.98
Anxiety						0.02	.19	.01	.09
Stress						0.01	.09	.01	.50
Parenting satisfaction						−0.02	−.19	.00	.07
Parenting efficacy						8.25	.00	.00	.98
Restriction	.39	.15	.12	5, 114	.00				
Depression						−0.05	−.15	.05	.26
Anxiety						0.12	.24	.06	.03
Stress						0.02	.08	.04	.57
Parenting satisfaction						−0.03	−.24	.01	.02
Parenting efficacy						−0.01	−.08	.02	.40
Pressure to eat[a]	.42	.17	.14	5, 113	.00				
Depression						0.01	.10	.02	.45
Anxiety						0.03	.17	.02	.13
Stress						−0.01	−.15	.01	.28
Parenting satisfaction						−0.02	−.38	.00	.00
Parenting efficacy						0.01	.13	.01	.17

Note: β is the standardized and *B* is the nonstandardized regression coefficient.
[a] Square root transformed.

was positively correlated with, parental depression, anxiety and stress. Pressure to eat was negatively correlated with parenting satisfaction and was positively correlated with parental depression, anxiety and stress. Covert control and overt control were not significantly related to any of the investigated parental characteristics.

A series of multivariate multiple regressions were undertaken to explore the relative contribution of parental depression, anxiety and stress and parenting satisfaction and efficacy to the explanation of variance in controlling parental feeding styles and practices. Results are present in Table 3.

None of the individual parental psychosocial wellbeing variables independently contributed significantly to the prediction of authoritarian parental feeding style. The overall model was however significant, $F(5,112) = 3.85$, $p < .01$ and the combination of variables accounted for 11% of the variance in authoritarian parental feeding style. Parental anxiety and parenting satisfaction contributed significantly to the prediction of restriction. These variables accounted for 12% of the variance in restriction and the overall model was significant, $F(5,114) = 4.10$, $p < .01$. Parenting satisfaction contributed significantly to the prediction of pressure to eat. This variable accounted for 14% of the variance in pressure to eat and the overall model was significant, $F(5,113) = 4.72$, $p < .01$. There were no significant predictors of authoritative parental feeding style or the parental feeding practices covert control and overt control.

Discussion

Two groups of analyses were undertaken in the current study. Firstly, a series of univariate correlational analyses were undertaken to explore whether parental feeding styles and practices were associated with parental depression, anxiety and stress and parenting satisfaction and efficacy. Following this a series of multivariate multiple regressions were undertaken to explore the unique relative contribution of parental depression, anxiety and stress and parenting satisfaction and efficacy to the explanation of variance in controlling parental feeding styles and practices.

Results from the correlational analyses indicated that mothers who reported being less satisfied in their role as a parent and experiencing higher levels of depression, anxiety and stress reported using higher levels of authoritarian parental feeding style. Mothers who reported higher levels of parenting efficacy reported higher levels of authoritative parental feeding style. Mothers who reported lower levels of parenting satisfaction and efficacy and higher levels of parental depression, anxiety and stress reported higher levels of the parental feeding practice restriction. Mothers who reported they were less satisfied in their role as a parent and experiencing higher levels of depression and anxiety and stress reported higher levels of the parental feeding practice pressure to eat. Covert control and overt control were not related to any of the investigated maternal psychosocial variables.

The findings that parents who reported higher levels of depression, anxiety and stress also reported higher levels of parental feeding styles and practices style are consistent with findings of studies of younger children (Blissett & Farrow, 2007; Hurley et al., 2008). Further, while the association between parenting satisfaction and controlling parental feeding styles and practices has not been investigated previously, these findings are consistent with the general parenting literature which indicates that low levels of parental satisfaction are associated with more controlling and less responsive parenting strategies (Ohan, Leung, & Johnston, 2000; Simons et al., 1993). It is probable that parents with low levels of parental satisfaction use more controlling parental feeding styles and practices because they have difficulty tuning in to and responding to their child's satiety cues. There was no relationship between, overt and covert control and parental depression, anxiety and stress and parenting satisfaction and efficacy. As overt and covert control are relatively new concepts in the parental feeding literature, further research is needed to confirm these findings.

Correlational analyses also revealed a number of relationships between the parental feeding styles and practices. For instance parents who reported higher levels of authoritative parental feeding style also reported higher levels of authoritarian parental feeding style. Given that both of these parental feeding styles are associated with control of child feeding this may explain why a positive relationship was found. Both authoritative and authoritarian parental feeding styles are associated with high levels of control; however they differ in terms of their level of responsiveness (Hughes et al., 2005). Research including authoritative and authoritarian parenting styles (not specific to the child feeding context) has also reported a positive relationship between these two constructs (Hubbs-Tait, Kennedy, Page, Topham, & Harrist,

Please cite this article in press as: Mitchell, S., et al. Maternal psychosocial predictors of controlling parental feeding styles and practices. *Appetite* (2009), doi:10.1016/j.appet.2009.08.001

2008). In addition pressure to eat was also correlated with authoritative and authoritarian parental feeding styles, which again may be explained by the level of control which is central to the feeding practice pressure to eat. Interestingly, overt control, but not covert control was related to restriction. This is consistent with the literature that has suggested that the CFQ subscale 'restriction' may measure more overt than covert control over children's food (Ogden et al., 2006). Given the conflicting findings of previous research when exploring the relationships between restriction and children's diet and weight (Ogden et al., 2006), the findings of the current study highlight the need for further exploration of the construct of restriction including different forms of restriction, such as overt and covert control.

To examine the unique contribution of each maternal psychosocial wellbeing variable to the investigated controlling parental feeding styles and practices, a series of regression analyses were undertaken. Results indicated that parenting satisfaction was the only significant predictor of the parental feeding practice pressure to eat. Parenting satisfaction and parental anxiety contributed significantly to the prediction of the parental feeding practice restriction. There were no significant predictors of authoritarian or authoritative parental feeding style.

Although the correlational analyses revealed that parental depression, anxiety and stress were related to pressure to eat, results of the regression analysis indicate that this relationship can be explained by parenting satisfaction. It is possible that parenting satisfaction was the only significant predictor because when compared to depression anxiety and stress, parenting satisfaction is the most directly related to parenting. That is, while feelings of depression, anxiety and stress are not always related to being a parent, parenting satisfaction is defined by a parent's feelings within the parental role and therefore this variable is most likely to directly parenting behaviours and in this case pressure to eat. Consequently it is plausible that parental depression, anxiety and stress impact parental feeding practices via parenting satisfaction. This finding has implications for previous research that has linked maternal psychopathologies to controlling parental feeding practices (Hurley et al., 2008) as these results may be explained by lower levels of parental satisfaction.

While results of this study were generally consistent with previous research, some limitations should be noted. Firstly, the sample was not ethnically diverse and given that culture has been found to influence parental feeding styles (Hughes et al., 2005), caution should be made when generalising the results to other cultural groups. In addition, causal interpretations of relationships in this study are limited due to the correlational methodology employed. Given that many of the interrelationships between variables examined in this study were novel, this methodology was deemed appropriate for exploration and the results provide a basis for future causal research.

Future research exploring the relationships between controlling parental feeding styles and practices, parental depression, anxiety and stress and parenting satisfaction and efficacy should consider employing a longitudinal design to allow for exploration of causation and the inclusion of fathers to allow for comparisons between mothers and fathers. Research should aim to examine other ineffective parenting behaviours, such as inconsistent discipline, that may be related to the use of controlling parental feeding styles and practices. A better understanding of the full breadth of parental characteristics related to controlling parental feeding styles and practices would assist in further development of interventions aimed at promoting more adaptive parental feeding styles and practices. Results of the current study indicate that incorporating strategies to reduce anxiety and increase parenting satisfaction may be a valuable addition to parental feeding interventions.

In conclusion, this study found that parenting satisfaction contributed significantly to the prediction of the parental feeding practice pressure to eat and both parenting satisfaction and parental anxiety contributed significantly to the prediction of the parental feeding practice restriction. These results extend on previous literature and highlight the need for research to explore the direction of these relationships.

Uncited reference

Q1

Nicol-Harper et al. (2007).

References

Antony, M., Bieling, P., Cox, B., Enns, M., & Swinson, R. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10*, 176–181.

Belsley, D. E., Kuh, E., & Welsch, R. (1980). *Regression diagnostics: identifying influential data and sources of collinearity*. New York: John Wiley & Sons.

Birch, L. L., Fisher, J. O., Grimm-Thomas, K., Markey, C. N., Sawyer, R., & Johnson, S. L. (2001). Confirmatory factor analysis of the Child Feeding Questionnaire: a measure of parental attitudes, beliefs and practices about child feeding and obesity proneness. *Appetite, 36*, 201–210.

Blissett, J., & Farrow, C. (2007). Predictors of maternal control of feeding at 1 and 2 years of age. *International Journal of Obesity, 31*, 1520–1526.

Brown, K. A., Ogden, J., Vögele, C., & Gibson, E. L. (2008). The role of parental control practices in explaining children's diet and BMI. *Appetite, 50*, 252–259.

Brown, T. A., Chorpita, B. F., Korotitsch, W., & Barlow, D. H. (1997). Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behaviour Research and Therapy, 35*, 79–89.

Clark, H. R., Goyder, E., Bissell, P., Blank, L., & Peters, J. (2007). How do parents' child-feeding behaviours influence child weight? Implications for childhood obesity policy. *Journal of Public Health (Oxford), 29*, 132–141.

Cole, T. J., Bellizzi, M. C., Flegal, K. M., & Dietz, W. H. (2000). Establishing a standard definition for child overweight and obesity worldwide: international survey. *British Medical Journal, 320*, 1240–1243.

Cole, T. J., Flegal, K. M., Nicholls, D., & Jackson, A. A. (2007). Body mass index cut offs to define thinness in children and adolescents: international survey. *British Medical Journal, 335*, 194.

Commonwealth Scientific Industrial Research Organisation. (2008). *2007 Australian National Children's Nutrition and Physical Activity Survey*. Canberra: Australian Government.

Farrow, C. V., & Blissett, J. M. (2005). Is maternal psychopathology related to obesigenic feeding practices at 1 year? *Obesity Research, 13*, 1999–2005.

Farrow, C. V., & Blissett, J. (2008). Controlling feeding practices: cause or consequence of early child weight? *Pediatrics, 121*, e164–e169.

Fisher, J. O., & Birch, L. L. (2000). Parents' restrictive feeding practices are associated with young girls' negative self-evaluation of eating. *Journal of the American Dietetic Association, 100*, 1341–1346.

Fisher, J. O., & Birch, L. L. (2002). Eating in the absence of hunger and overweight in girls from 5 to 7 y of age. *American Journal of Clinical Nutrition, 76*, 226–231.

Francis, L. A., Hofer, S. M., & Birch, L. L. (2001). Predictors of maternal child-feeding style: maternal and child characteristics. *Appetite, 37*, 231–243.

Galloway, A. T., Fiorito, L., Lee, Y., & Birch, L. L. (2005). Parental pressure, dietary patterns, and weight status among girls who are "picky eaters". *Journal of the American Dietetic Association, 105*, 541–548.

Hill, N. E., & Bush, K. R. (2001). Relationships between parenting environment and children's mental health among African American and European American mothers and children. *Journal of Marriage and the Family, 63*, 954–966.

Hubbs-Tait, L., Kennedy, T. S., Page, M. C., Topham, G. L., & Harrist, A. W. (2008). Parental feeding practices predict authoritative, authoritarian, and permissive parenting styles. *Journal of the American Dietetic Association, 108*, 1154–1161.

Hughes, S. O., Power, T. G., Fisher, J. O., Mueller, S., & Nicklas, T. A. (2005). Revisiting a neglected construct: parenting styles in a child-feeding context. *Appetite, 44*, 83–92.

Hurley, K. M., Black, M. M., Papas, M. A., & Caufield, L. E. (2008). Maternal symptoms of stress, depression, and anxiety are related to nonresponsive feeding styles in a statewide sample of WIC participants. *The Journal of Nutrition, 138*, 799–805.

Johnston, C., & Mash, E. J. (1989). A measure of parenting satisfaction and efficacy. *Journal of Clinical Child Psychology, 18*, 167–175.

Lee, Y., Mitchell, D. C., Smiciklas-Wright, H., & Birch, L. L. (2001). Diet quality, nutrient intake, weight status, and feeding environments of girls meeting or exceeding recommendations for total dietary fat of the American Academy of Pediatrics. *Pediatrics, 107*, e95–e102.

Lovejoy, C. M., Graczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: a meta-analytic review. *Clinical Psychology Review, 20*, 561–592.

Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the depression anxiety stress scales* (2nd ed.). Sydney: Psychology Foundation.

Miles, C., Brennan, L., Mitchell, S., Matthews, J. (2009). *Child, Parent and Parenting Predictors of Children's School Lunch Content*. Unpublished manuscript.

Montgomery, C., Jackson, D. M., Kelly, L. A., & Reilly, J. J. (2006). Parental feeding style, energy intake and weight status in young Scottish children. *British Journal of Nutrition, 96*, 1149–1153.

Please cite this article in press as: Mitchell, S., et al. Maternal psychosocial predictors of controlling parental feeding styles and practices. *Appetite* (2009), doi:10.1016/j.appet.2009.08.001

Nicol-Harper, R., Harvey, A. G., & Stein, A. (2007). Interactions between mothers and infants: impact of maternal anxiety. *Infant Behavior and Development, 30*, 161–167.

Ogden, J., Reynolds, R., & Smith, A. (2006). Expanding the concept of parental control: a role for overt and covert control in children's snacking behaviour? *Appetite, 47*, 100–106.

Ohan, J., Leung, D., & Johnston, C. (2000). The parenting sense of competence scale: evidence of a stable factor structure and validity. *Canadian Journal of Behavioural Science, 32*, 251–261.

Patrick, H., Nicklas, T. A., Hughes, S. O., & Morales, M. (2005). The benefits of authoritative feeding style: caregiver feeding styles and children's food consumption patterns. *Appetite, 44*, 243–249.

Rogers, H., & Matthews, J. (2004). The parenting sense of competence scale: investigation of the factor structure, reliability, and validity for an Australian sample. *Australian Psychologist, 39*, 88–96.

Simons, R. L., Beaman, J., Conger, R. D., & Chao, W. (1993). Childhood experience, conceptions of parenting, and attitudes of spouse as determinants of parental behavior. *Journal of Marriage and the Family, 55*, 91–106.

van der Bruggen, C. O., Stams, G. J. J. M. , & Bögels, S. M. (2008). The relation between child and parent anxiety and parental control: a meta-analytic review. *Journal of Child Psychology and Psychiatry, 49*, 1257–1269 (Research Review).

Ventura, A. K., & Birch, L. L. (2008). Does parenting affect children's eating and weight status? *International Journal of Behavioral Nutrition and Physical Activity, 5*, 15.

Please cite this article in press as: Mitchell, S., et al. Maternal psychosocial predictors of controlling parental feeding styles and practices. *Appetite* (2009), doi:10.1016/j.appet.2009.08.001