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MATERNAL MENTAL HEALTH AND CHILD FEEDING PROBLEMS IN A
NON-CLINICAL GROUP

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Abstract

Objective: To compare the contribution of symptoms of anxiety, depression and eating psychopathology to reports of child feeding difficulties in a non-clinical group of mothers of male and female children. **Method:** A community sample of 56 mothers of male children and 40 mothers of female children with a mean age of 32 months completed measures of anxiety, depression, eating psychopathology and child feeding problems. **Results:** In mothers of male children, symptoms of depression and anxiety, but not eating psychopathology, were predictors of difficult feeding interactions. In contrast, in mothers of female children, symptoms of bulimia and depression, but not anxiety, were significant predictors of reported food refusal. **Discussion:** Different aspects of psychopathological symptomology may be risk factors for reports of feeding problems dependent on the child's gender. Further work should continue to assess the nature of and motivation for the controlling feeding behaviors exhibited by mothers of children of different genders.

MATERNAL MENTAL HEALTH AND CHILD FEEDING PROBLEMS IN A NON-CLINICAL GROUP

Feeding problems in childhood are common (Coulthard & Harris, 2003), relatively stable (Dahl, Rydell & Sundelin, 1994), and have potentially deleterious consequences for both cognitive and physical development (Grantham-McGregor, Walker & Chang, 2000; Skuse, 1993). Furthermore, the quality of the parent-child relationship is often compromised in feeding disordered dyads (Cooper, Whelan, Woolgar, Morrell & Murray, 2004; Lindberg, Bohlin, Hagekull & Palmerus, 1996). For example, the interactions between mothers and their children with feeding problems are characterized by maternal insensitivity and controlling behavior, difficult child temperament and poorer social communication in both feeding and play (e.g. Hagekull, Bohlin & Rydell, 1997; Keren, Feldman & Tyano, 2001).

A variety of aspects of maternal mental health have been repeatedly associated with child feeding difficulties, including symptoms of anxiety and depression (Chatoor, Ganiban, Colin, Plummer & Harmon, 1998; Coulthard & Harris, 2003; Lindberg et al., 1996) and eating psychopathology (e.g. Coulthard, Blissett & Harris, 2004). However, the findings are often equivocal, the direction of causality in these relationships is often ambiguous, particularly in the context of anxiety and depression, and the mechanisms of their interaction are far from clear. Some studies have demonstrated effects of maternal anxiety but not depression on difficult feeding interactions (e.g. Farrow & Blissett, 2005), whilst other studies find significant effects of both depression and anxiety (e.g. Coulthard & Harris, 2003), and yet others find no significant effects of affective disorder on feeding problems (e.g. Whelan & Cooper, 2000). Collectively, these findings suggest that the potential contribution of each of

these different symptom patterns needs to be tested separately to allow us to better pinpoint the links between these symptoms and feeding difficulties. A further complication within this literature is that depression, anxiety and eating disorder symptoms are often co-morbid (e.g. Becker, DeViva & Zayfert, 2004; Rush et al., 2005). Research which assesses only one element of symptomology may be confounded by participants' possession of symptoms from other diagnoses, which may be equally likely to affect the parent-child relationship within the context of feeding.

Blissett, Meyer, Farrow, Bryant-Waugh & Nicholls (2005) suggested that different expectations for social norms for male and female children, and maternal anxiety about achieving these ideals, may help to explain the different relationships between mental health and reported problems for mothers of girls and boys. The parent's anxiety about the child's achievement of specific gender-linked goals, such as the achievement of slimness by girls and greater height and weight by boys (Hill & Franklin, 1998; Pierce & Wardle, 1993; Tiggemann, & Lowes, 2002), may be associated with carrying out gender-specific parenting practices designed to facilitate the achievement of these goals, such as pressurizing or controlling food intake, despite their ultimately negative outcome (Costanzo & Woody, 1985; Fisher & Birch, 1999). Indeed it has been previously shown that maternal eating psychopathology is related to controlling feeding practices in mothers of girls but not boys (Blissett, Meyer & Haycraft, in press; Tiggemann & Lowes, 2002; Jacobi, Agras & Hammer, 2001). However, despite the proposal of a role for anxiety and eating psychopathology in this relationship, no assessment of the symptoms of anxiety, depression, or eating psychopathology was carried out within Blissett et al.'s (2005)

study. The relationship between these psychopathological symptoms and reports of feeding difficulties by mothers of girls and boys remains to be investigated.

To summarize, existing research suggests that children's feeding problems are frequently related to maternal anxiety, depression, and eating psychopathology. Furthermore, it appears that there may be gender differences in the motivation for controlling food intake of children of different genders (Blissett et al., 2005; Tiggeman & Lowes, 2002). However, the relative importance of anxiety, depression and eating psychopathology in reports of child feeding difficulties for boys and girls has yet to be established.

Aims and hypotheses

This study aimed to examine the relative contribution of anxiety, depression, and eating psychopathology to the explanation of variance in feeding difficulties in boys and girls separately. It was hypothesized that symptoms of eating psychopathology would be significant predictors of difficult feeding interactions in mothers of girls once the effects of anxiety and depression were controlled for. In contrast, it was hypothesized that symptoms of anxiety and depression would be significant predictors of difficult feeding interactions in mothers of boys and that maternal eating psychopathology would not add to the explanation of variance of feeding problems in this group.

METHODS

Participants

Following informed consent, 96 mothers of children aged between 13-49 months completed a set of standardized questionnaires. Fifty-eight percent of the children were male (mean age 31.5 months, SD= 10.04) and 42 % were female (mean

age 32.0 months, SD=11.0). The mothers' mean age was 34 years (SD=5.4) and mean BMI was 23.6 (SD=4.0). The children's mean BMI was 17.8 (SD=4.9). There were no significant differences between male and female children in their age or BMI.

Measures

The mothers completed the following self-report questionnaires:

Eating Disorders Inventory-2 (EDI-2) (Garner, 1991)

The EDI-2 is a 91-item measure of eating psychopathology, divided into eleven subscales: Drive for Thinness, Bulimia, Body Dissatisfaction, Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, Maturity Fears, Asceticism, Impulse Regulation, and Social Insecurity. In this study, only the first three subscales were used (23 items), because they most specifically address eating and dieting behaviors and cognitions rather than broader psychological distress commonly associated with eating disorders, such as maturity fears or perfectionism. The EDI asks respondents to rate how true a statement is about themselves on a six-point Likert scale, with possible responses ranging from "Always" to "Never." This includes statements such as 'I am terrified of gaining weight' (drive for thinness), 'I stuff myself with food' (bulimia), and 'I think my thighs are too large' (body dissatisfaction). The EDI-2 has good test-retest reliability, consistency and appropriate content, convergent, and discriminant validity (Garner, 1991). Higher scores reflect greater levels of pathology. The potential range of scores for each item is from 0 to 3. Subscale scores are then summed to give a range between 0 and 27.

Beck Anxiety Inventory (BAI: Beck, Epstein, Brown & Steer, 1988)

The BAI is a widely used measure designed to reliably discriminate clinical anxiety from depression. It consists of 21-items, each describing a common symptom of anxiety (e.g. 'fear of the worst happening'), which is rated according to the frequency of symptom experience during the past week on a 4-point scale ranging from 0 (not at all) to 3 (severely - it bothered me very much). A single score is produced, ranging from 0 to 63. The measure has been found to have good test-retest reliability and to be highly internally consistent (Creamer, Foran & Bell, 1995), has demonstrated good factorial validity (Kabacoff, Segal, Hersen & VanHasselt, 1997) and high discriminant validity, with good psychometric properties in use with non-clinical samples (Creamer, Foran & Bell). In general, a score of 0-7 indicates minimal anxiety, 8-15 mild anxiety, 16-25 moderate anxiety, and over 26 severe anxiety (Beck, Epstein, Brown & Steer, 1988).

Beck Depression Inventory-II (BDI-II: Beck, Steer & Brown, 1996)

The BDI-II is a 21-item measure designed to assess levels of depression in adolescents and adults. Lasa, Ayuso-Mateos and Vazques-Barquero (2000) found the original BDI to be a good instrument for screening depressive disorders in the general population. The BDI-II has high levels of internal consistency (Storch, Roberti & Roth, 2004) and a good factor structure (Dozois, Dobson & Ahnberg, 1998). The respondent must select one statement from a graded series to indicate the statement that is most fitting for them (e.g. I do not feel sad/ I feel blue or sad/ I am blue or sad all the time and I can't snap out of it/ I am so sad or unhappy that it is very painful/ I am so sad or unhappy that I can't stand it). A single score is produced, ranging from 0 to 63. As a general rule, scores in the 10-16 range indicate mild depression, 17-20 indicate borderline clinical depression, 21-30 indicate moderate depression, 31-40

indicates severe depression and a score over 40 suggests extreme depression (Beck, Steer & Garbin, 1988).

Child Feeding Assessment Questionnaire (CFAQ: Harris & Booth, 1992)

Two sections of the CFAQ were used in this study: Mealtime Negativity (examines parental perceptions of how difficult the child is to feed and parental use of maladaptive management strategies); and Food Refusal (how frequently different types of food refusals occur). Mealtime Negativity ratings are calculated based on nine questions assessing caregivers' perceptions of how negative feeding interactions are for both the caregiver and the child. The subscale also includes questions asking about perceptions of their child's appetite, whether the caregiver thinks the child eats enough, whether the child is easy to feed, whether mealtimes are relaxed, rushed, anxious, and happy for the parent and child. The mealtime negativity scale also asks about what mealtime management strategies the caregiver uses if the child doesn't eat enough (e.g. coax, force-feed, distract, reward). Scores for mealtime negativity can range from 7 to 106. Food refusal ratings are calculated on the frequency with which a set of child behaviors (e.g. spits out food) occurs across a week, which parents rate as occurring from 'never' (0) to 'most meals' (21). Food refusal scores can range from 0 to 168. Higher scores on the CFAQ indicate greater prevalence of feeding problems. Little data exist regarding the reliability and validity of the CFAQ, but it has been used with success in many studies of children's feeding problems in interview and questionnaire form (Blissett et al., 2005; Cooper et al., 2004; Coulthard & Harris, 2003; Whelan & Cooper, 2000) and correlates well with observations of child feeding problems (Blissett, 1998).

Procedure

The mothers were recruited from four private pre-school nurseries. Each nursery distributed the questionnaires to every mother with a child within the age range of 12 to 50 months. Each mother provided informed consent, and then completed the questionnaires, which were returned anonymously to the researchers through the individual nurseries.

Data Analysis

Exploratory t-test analyses were carried out to ensure that mothers of male and female children did not differ significantly on any important variables. There were no significant differences between mothers of male and female children in their reports of mealtime negativity or food refusal or in their reports of psychopathological symptoms (see Table 1). Child age, maternal age, child BMI and maternal BMI were not significantly correlated with mealtime negativity or food refusal in either male or female children, and hence were not controlled for in subsequent analyses.

To explore the relative contribution of BAI, BDI and EDI scores to the explanation of variance in CFAQ scores in male and female children, hierarchical multiple regressions were carried out to predict each feeding variable for male and female children separately. The data were checked to ensure there were no violations of the assumptions made by multiple regression including multicollinearity, linearity, homoscedasticity of residuals and outliers. Whilst the subscales of the BDI, BAI and EDI questionnaires were significantly correlated with one another, no correlation coefficient was greater than 0.7, a cut-off point recommended for tolerance within regression analysis (Field, 2000), with the exception of correlations between drive for

thinness scores with bulimia and body dissatisfaction ($r = .778$, $p < 0.001$; $r = .702$, $p < 0.001$, respectively). Therefore, because of unsatisfactory tolerance statistics, suggesting multicollinearity with other measures of eating psychopathology, drive for thinness was removed from the regression analyses. Hierarchical multiple regressions (enter method) were used to ascertain whether depression symptoms predicted mealtime negativity or food refusal. In the second step of the multiple regressions, anxiety symptoms were added to assess their significance in predicting child feeding problems after controlling for depression. Depression and anxiety symptoms were entered separately to evaluate their relative independent contribution to reported feeding difficulties, given the potential difference in the effect of such symptoms on maternal styles in feeding interactions (e.g. withdrawn vs. intrusive behavior). Finally, in the third step, body dissatisfaction and bulimia symptoms were added, to assess their significance after controlling for depression and anxiety.

RESULTS

Characteristics of the sample

Table 1 shows the descriptive data for CFAQ, BAI, BDI, and EDI scores reported by mothers of male and female children.

Table 1 about here

Mealtime negativity and food refusal scores are broadly comparable to those reported by Blissett et al. (2005) in a non-clinical sample of mothers of preschool children with a mean age of 38 months. The EDI scores reflect a non-clinical group, where eating

psychopathology scores are typically low, and indeed this sample's scores are similar to those collected for a non-clinical sample of women with a mean age of 31 (Berman, Lam & Goldner, 1993). On average, the sample also show low anxiety and depression scores, with the mean scores being below the commonly used cut-off points of 10 for mild depression (Beck, Steer & Garbin, 1988) and 8 for mild anxiety (Beck et al., 1988). However, within the sample, using the standard cut-off points for the BDI, twelve participants could be suggested to be mildly depressed, six report symptoms indicative of borderline clinical depression, four show moderate depression and one participant reported symptoms consistent with extreme depression. Furthermore, using standard cut-offs for the BAI, twenty-two mothers report anxiety symptoms consistent with a diagnosis of mild anxiety, and a further eleven report moderate anxiety.

Prediction of feeding problems in boys and girls using hierarchical multiple regressions.

Four hierarchical multiple regressions (enter method) were performed to evaluate the contribution of maternal psychopathological symptoms in predicting child mealtime negativity and food refusal for boys and girls, and to enable us to evaluate the significance of the contribution of eating psychopathology to child feeding problems after controlling for depression and anxiety. Table 2 presents the results of the regressions to predict reports of mealtime negativity, and Table 3 presents the results of regressions to predict reports of food refusal.

Tables 2 & 3 about here

Predicting mealtime negativity in boys

In the first model, maternal depression symptoms significantly predicted maternal report of mealtime negativity in boys. In step 2, maternal anxiety symptoms significantly added to the variance explained. In this second model, anxiety was significantly associated with reported mealtime negativity but depression was no longer a significant predictor. In step three, addition of eating psychopathology symptoms to the model did not add significantly to the variance explained. In this final model, anxiety remained the only significant predictor of maternal reports of mealtime negativity with their sons (see Table 2).

Predicting mealtime negativity in girls

In the first model maternal depression symptoms did not significantly predict maternal report of mealtime negativity in girls. In step 2, maternal anxiety symptoms did not add to the variance explained, and in step three, eating psychopathology also failed to add to the variance explained (see Table 2).

Predicting food refusal in boys

Table 3 shows that in the first model, maternal depression symptoms significantly predicted maternal report of food refusal in boys. In step 2, maternal anxiety symptoms did not significantly add to the variance explained, and indeed the overall model became non-significant ($p=0.055$). In this second model, depression remained a significant predictor of food refusal. In step three, eating psychopathology

also failed to add to the variance explained. Although this final overall model was not significant, depression was still significantly associated with reported food refusal.

Predicting food refusal in girls

Table 3 shows that in the first model, maternal depression symptoms did not significantly predict maternal report of daughter's food refusal. In step 2, maternal anxiety symptoms did not add significantly to the variance explained. However, in step three, eating psychopathology added significantly to the variance explained and in this final model, symptoms of depression and bulimia were significantly associated with reported food refusal in girls.

DISCUSSION

The aim of this study was to examine the contribution of different aspects of maternal mental health to reports of difficult feeding interactions by mothers of children of different genders. Symptoms of anxiety were demonstrated to predict reports of mealtime negativity in boys, and symptoms of depression predicted reports of food refusal behaviors in boys. In contrast, mental health symptoms were not shown to be significant predictors of maternal report of mealtime negativity with their daughters. However, maternal bulimia and depression symptoms were significant predictors of reports of daughter's food refusal when the effects of anxiety symptoms were controlled for.

Symptoms of depression were significant predictors of reports of feeding difficulty in this non-clinical sample of mothers of sons and daughters. Symptoms of depression in mothers of boys were linked to reports of greater rates of food refusal, supporting other research which has suggested that maternal depression may not

facilitate appropriate problem solving in the presence of feeding difficulties (Coulthard & Harris, 2003). However, in mothers of girls, depressive symptomology only appeared to be a significant predictor of food refusal in combination with symptoms of bulimia, and indeed, then the relationship between depressive symptoms and food refusal was unexpectedly negative, suggesting that high bulimia scores in combination with low depression scores may be a problematic combination which predicts report of higher rates of daughter's food refusal. Whilst inconsistent with the data for mothers of male children, this finding fits in with the suggestion that higher levels of maternal depression may divert attention away from the recognition of problem eating in her daughter. However, when a mother reports symptoms of bulimia in combination with lower levels of depression, she is perhaps more likely to behave in a way which exacerbates food refusal behaviors in her daughter, or to perceive more significant problems with her daughter's eating behavior. Given that this study did not find that psychopathological symptoms predicted mealtime negativity, a measure of parental use of pressuring mealtime management strategies, it could be proposed that in the presence of symptoms of bulimia, over-provision of food, or restrictive feeding practices, rather than coercive feeding strategies, may be the cause of increased child food refusal. Indeed, both restrictive feeding practices and provision of less healthy foods have been previously associated with maternal eating disorder (e.g. Coulthard, Blissett & Harris, 2004). Whilst further observational work is required to examine these suggestions, this study lends further support to the idea that maternal eating psychopathology tends to be related to feeding difficulty in mothers of daughters but not sons (e.g. Tiggeman & Lowes, 2002).

This study is the first to suggest that symptoms of maternal anxiety may be a specific associate of the report of difficult mealtime interactions with boys. Symptoms

of anxiety have previously been found to be associated with more controlling feeding practices in infancy, and a recent longitudinal study has demonstrated that anxiety symptomology during pregnancy can predict the use of controlling feeding practices during the infant's first year, suggesting that maternal anxiety may predate the child's feeding difficulty and prevent appropriate problem solving when presented with common feeding challenges (Farrow & Blissett, 2005). This study suggests that this relationship may be particularly apparent in mother-son dyads. Furthermore, this study demonstrates one potential reason for equivocality in research concerning the role of affective disorders in feeding problems (Coulthard & Harris, 2003; Whelan & Cooper, 2000), given that the relationship between symptoms of anxiety and feeding difficulties was only supported for mothers of boys, when the majority of studies ignore the gender of the child in their analyses.

There are a number of important limitations to this study. Firstly, the study relies on maternal report of feeding problems and practices. However, a number of studies have demonstrated that maternal reports of feeding difficulties are reliable and accurately reflect observer-rated feeding problems (Blissett, 1998; Cooper et al., 2004; Whelan & Cooper, 2000). Detection of the potential subtleties of the differences in interactions between mothers and their children of different genders may be aided by future observational research which is specifically focused on these issues. Furthermore, the Child Feeding Assessment Questionnaire (Harris & Booth, 1992) assesses child feeding problems and maternal behaviors which focus on the refusal of foods, either in terms of amount or range, rather than the control of overeating. To unravel the potential differences in motivation for controlling food intake in children of different genders, future work may benefit from the examination of parents' control over their children's restricted eating and overeating. The potential

role of the fathers in the feeding situation should not be overlooked, and further work is needed which includes paternal contributions to feeding difficulties. Finally, this is a study of a non-clinical sample, with few mothers reporting symptomology indicating clinical disorders, and should not be interpreted to suggest that feeding interactions are unlikely to be problematic for male children of women with eating disorders, or that clinical maternal anxiety might not have a negative impact on female offspring.

In summary, this study provides further evidence to support the theory that a woman's eating psychopathology symptoms are significantly implicated in her feeding strategies and reports of child feeding difficulties, particularly if her child is female (e.g. Tiggeman & Lowes, 2002). It is perhaps the case that anxiety associated with male children's feeding problems is commonly associated with concerns about maximizing healthy eating and intake, with associated behavioral strategies which may focus on overprovision of foods and coaxing to eat. In contrast, the challenges of feeding female children are commonly concerned with controlling and minimizing unhealthy eating and preventing the development of overweight, particularly in mothers who have unhealthy eating attitudes. This study has lent further support for the relationship between psychopathological symptoms and feeding problems in non-clinical groups, but further work should continue to assess the precise nature and motivation for the controlling behaviors reported by the mothers of children of different genders, and their children's responses to the imposition of control over food intake.

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Table 1. Mean and standard deviation and t-statistics of reported mealtime negativity, food refusal, anxiety, depression and eating psychopathology by mothers of male (n=56) and female (n=40) children.

	Mothers of Male children Mean (SD)	Mothers of Female children Mean (SD)	t = (df= 94)
Mealtime negativity	28.70 (13.29)	25.13 (10.22)	1.42, NS
Food refusal	8.58 (13.02)	10.35 (14.09)	-.631, NS
Drive for thinness	3.06 (4.87)	3.26 (5.21)	-.187, NS
Bulimia	1.38 (3.64)	1.17 (2.70)	.324, NS
Body dissatisfaction	10.30 (8.83)	8.14 (8.30)	1.212, NS
Anxiety	6.16 (5.53)	5.70 (6.28)	.380, NS
Depression	6.91 (6.61)	7.52 (8.58)	-.396, NS

Table 2. Hierarchical Regression Analyses to predict mealtime negativity in male and female children.

		Boys' Mealtime Negativity					Girls' Mealtime Negativity				
		Model R ²	Model F	Model R ² change	t for individual predictors	β for individual predictors	Model R ²	Model F	Model R ² change	t for individual predictors	β for individual predictors
Model 1:	Depression	.15	9.15**	N/A	3.03**	.38**	.04	1.57	N/A	1.25	.20
Model 2:	Depression				.61	.09				.55	.13
	Anxiety	.29	10.94*****	.15*	3.32**	.48**	.04	.861	.01	.43	.10
Model 3:	Depression				-.04	-.01				.53	.13
	Anxiety				3.11**	.46**				.36	.09
	Bulimia				.59	.11				.53	.11
	Body dissatisfaction	.31	5.61***	.01	.57	.08	.06	.573	.02	-.74	-.14

<.01, *<.001, *****p<.0001

Table 3. *Hierarchical Regression Analyses to predict food refusal in male and female children.*

		Boys' Food refusal					Girls' Food refusal				
		Model R ²	Model F	Model R ²	t for	β for	Model	Model F	Model	t for	β for individual
				change	individual	individual	R ²		R ²	individual	predictors
					predictors	predictors			change	predictors	
Model 1:	Depression	.10	6.10*	N/A	2.47*	.32*	.01	.33	N/A	.57	.09
Model 2:	Depression				2.16*	.35*				-.91	-.21
	Anxiety	.10	3.06	.002	-.36	-.06	.09	1.84	.08	1.83	.41
Model 3:	Depression				2.10*	.45*				-2.68*	-.52*
	Anxiety				-.34	-.06				1.37	.25
	Bulimia				-.71	-.14				3.63***	.60***
	Body dissatisfaction	.11	1.62	.009	.13	.02	.45	7.09*****	.36*****	1.59	.24

*p<.05, ***p<0.001 *****p<.0001