



University
of Glasgow

Robertson, Joanne (2006) *Adapting the Mellow Parenting Scale to assess videoed meals in children aged 1-2 years: is it practical, valid and reliable, and does it discriminate between children with and without weight faltering?* D Clin Psy thesis

<http://theses.gla.ac.uk/5994/>

Copyright and moral rights for this thesis are retained by the author

A copy can be downloaded for personal non-commercial research or study, without prior permission or charge

This thesis cannot be reproduced or quoted extensively from without first obtaining permission in writing from the Author

The content must not be changed in any way or sold commercially in any format or medium without the formal permission of the Author

When referring to this work, full bibliographic details including the author, title, awarding institution and date of the thesis must be given

Adapting the Mellow Parenting Scale to assess videoed meals in children aged 1-2 years: is it practical, valid and reliable, and does it discriminate between children with and without weight faltering?

and Research Portfolio

**Volume One
(Volume Two bound separately)**

Joanne Robertson

August 2006

Submitted in partial fulfilment for the degree of Doctor of Clinical Psychology



IMAGING SERVICES NORTH

Boston Spa, Wetherby

West Yorkshire, LS23 7BQ

www.bl.uk

VOLUME 2 IS UNAVAILABLE

**PLEASE CONTACT THE UNIVERSITY IF YOU WISH TO
SEE THIS MATERIAL**

Acknowledgments

The author would like to thank all those who have supported, advised, and provided invaluable guidance in the completion of this portfolio. Special thanks to Professor Charlotte Wright and Dr Andrew Gumley for their supervision over the last two years and to Christine Puckering for her expert advice.

I would also like to thank my clinical colleagues, administration staff, and classmates over the last three years in particular the members of my study group, especially Leigh, for all their practical and emotional support.

Particular thanks is extended to all my family and friends for their unstinting belief and unconditional support throughout the last three years. It has been very much appreciated.

<u>Contents</u>	Pages	
Chapter 1	Small Scale Service Related Project	2-19
	<i>The identification and treatment of childhood sexual abuse disclosure among patients diagnosed with a schizophrenia spectrum disorder: a service evaluation</i>	
Chapter 2	Systematic Literature Review	20-62
	<i>Maternal Depression and Infant Weight Faltering: A Systematic Review of the Literature</i>	
Chapter 3	Major Research Project Proposal	63-80
	<i>Adapting the Mellow Parenting Scale to assess videoed meals in children aged 1-2 years: is it practical, valid and reliable, and does it discriminate between children with and without weight faltering – a research proposal</i>	
	<i>Amendments to Study</i>	80
Chapter 4	Major Research Project	81-122
	<i>Adapting the Mellow Parenting Scale to assess videoed meals in children aged 1-2 years: is it practical, valid and reliable, and does it discriminate between children with and without weight faltering?</i>	
Chapter 5	Abstract for Single Case Research Study	123
	<i>A structured teaching intervention to reduce challenging behaviours in a 15 year old adolescent with learning disabilities and an autistic spectrum disorder</i>	
Chapter 6	Appendices	124-165
	Appendix 1 – Small Scale Service Related Project	124-131
	Appendix 2 – Systematic Literature Review	132-143
	Appendix 3 – Major Research Project	144-165

Chapter 1: Small Scale Service Related Project

The identification and treatment of childhood sexual abuse disclosure among patients diagnosed with a schizophrenia spectrum disorder: a service evaluation

Joanne Robertson

Prepared in accordance with requirements for submission to Health Bulletin

*Submitted in partial fulfilment of the requirements for the degree of Doctor of Clinical
Psychology.*

***Address for Correspondence:**

**Joanne Robertson
Section of Psychological Medicine
Division of Community Based Sciences
University of Glasgow
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow G12 0XH
Tel: 0141 211 3920
Fax: 0141 357 4899
E-mail: 9608041r@student.gla.ac.uk**

Objective: In the context of numerous studies demonstrating that a significant proportion of psychiatric patients have been sexually abused at some point in their lives, this study evaluated community mental health team staffs' practices with regards to the identification and treatment of sexual abuse disclosure among patients diagnosed with a schizophrenia spectrum disorder and established the perceived need for training among staff in this area.

Design: Postal survey questionnaire

Results: 13 (76%) of 17 staff members based at a community mental health team located in Glasgow responded to the survey. All of these staff members reported that they had worked with clients diagnosed with a schizophrenia spectrum disorder affected by issues relating to sexual abuse histories. An average of 5.9% of staff's caseloads comprise clients from this group. 11 members of staff (85%) do not routinely enquire about sexual abuse in this population and 8 (62%) are not in favour of universal screening at the assessment stage. All staff routinely record disclosures of abuse in client casenotes. Eleven staff members (85%) reported that they would tend to refer these clients to other agencies for input on issues relating to sexual abuse, although 9 respondents (69%) felt it was part of their role to work on the sexual abuse issues themselves. Nine respondents (69%) had received training to deal with issues relating to sexual abuse and 10 respondents (77%) would like the opportunity to attend training to work with clients affected by issues of abuse. Nine staff members (69%) reported a particular interest in working with clients affected by sexual abuse.

Conclusions: Community mental health team staff work directly with clients with schizophrenia spectrum disorders affected by issues relating to histories of childhood sexual abuse as part of their usual caseload. However staff do not routinely enquire about sexual abuse with this population and are not in favour of universal screening for abuse at the assessment stage. Staff generally agree that it is part of their role to work with these clients, and many report that they would like the opportunity to receive further training to facilitate work with these clients. Overall, staff indicated that they perceive a need for specialist training to work with this population and many indicated a specialist interest in working with this population.

Key words: abuse, schizophrenia, assessment, treatment

Childhood sexual abuse is regarded as posing a considerable public health problem, which can lead to a wide range of psychological and medical problems in later life. A review of international studies from 19 countries found ranges of 7-36% of women and 3-29% of men experience sexually abusive acts in childhood (Finkelhor, 1994.) In addition to the pervasiveness of such a societal problem, the impact upon the survivors has been illustrated to be quite dramatic. Research suggests that up to 50% of women and 23% of men receiving psychiatric help in Great Britain have been sexually abused as children (Ainscough and Toon, 1996.) Although rates as high as 72% have been quoted by some authors (Bryer et al, 1987.)

Certainly the relationship between child abuse and psychiatric inpatient status is well established. In a review of 15 studies it was approximated that two-thirds of women inpatients report either physical or child sexual abuse (Read, 1997a.) The prevalence of sexual abuse in the severe mental illness population has been estimated to be between 34-55% (Meuser et al, 2002.) However, a survey of the general population, report that 85% of women previously admitted to a psychiatric hospital had been sexually abused by the age of 16 years (Mullen et al, 1993.) Lower rates of childhood sexual abuse have been reported within male inpatients (Jacobson and Richardson, 1987), with differences for sexual abuse among inpatients being reported as 38% for women vs. 24% for males (Sansouet-Hayden et al, 1987); 52% vs. 39% (Wurr and Partridge, 1996); and 54% vs. 26% (Jacobson and Herald, 1990.)

Interestingly however has been the recent increase in research activity focusing on the possibility of a relationship between child abuse and adult psychotic disorders. In a study of incest survivors, the Symptom Checklist 90 Revised (SCL-R-90) was used to

compare the symptom profiles of the target group with that of a control group of non-abused women receiving psychological treatment. Of the three scales on which the incest group exhibited greater symptomatology, the Psychoticism scale produced the largest difference (Lundberg-Love et al, 1990.) Comparable results have since been found with male outpatients (Swett et al, 1990.) More specifically, it has been found that 60% of female inpatients with a diagnosis of schizophrenia have experienced childhood sexual abuse (Friedman and Harrison, 1984), and abused patients score higher on measures of symptoms that are usually considered indications of schizophrenia such as hallucinations, as well as exhibiting more psychotic symptoms in general (Shearer et al, 1990). Therefore it seems reasonable to conclude that there may be a relationship between child abuse and adult psychosis and more specifically between child abuse and schizophrenia (Read, 1997b.)

Following from this, clinicians should expect that a significant proportion of individuals diagnosed with a schizophrenia spectrum disorder will have a history of childhood sexual abuse. Therefore staff are likely to play an integral role in the identification and understanding of abuse and also in determining provision and quality of support for such clients. However previous studies have indicated that only around half of mental health staff have received any specialist training in working with childhood sexual abuse, and that there is immense variation both in working knowledge and experience within this area (Campbell and Carson, 1995.) In a recent casenote review for instance of 32 identified cases of childhood sexual abuse, none were reported to have received support, counselling or information while in hospital and only three referrals were made for ongoing counselling (Read and Fraser, 1998 a & b.) Furthermore, it has been repeatedly shown that the relationship between child

abuse and psychiatric disorders has frequently been underestimated by researchers reliance on casenote records. Briere and Zaidi (1989) report figures from a psychiatric emergency room of 6% in the records and 70% when asked. Similar figures have been found by Wurr and Partridge (1996.) Statistics such as these have prompted many researchers to call for routine questioning into sexual abuse at the assessment stage and for further training of mental health staff with regards to the identification and treatment of childhood sexual abuse within severe mental illness.

Given that there are currently no national guidelines for treatment of childhood sexual abuse in this population there are a number of reasons why it is important that mental health staff are equipped with the appropriate skills and knowledge irrespective of whether or not they are involved in the treatment of clients affected by issues of abuse. Firstly, it is highly likely that nurses in the UK will encounter patients who will disclose abuse to them during the normal course of their work (Kelley, 1988.) Given that a client will have had to summon up a great deal of courage in order to disclose abuse to a mental health professional, it is important that staff are equipped to respond appropriately so as not to compound their psychological problems (Everill and Walker, 1994.) Bearing this in mind, the current research aims to evaluate community mental health team staffs' practices with regards to the identification and treatment of sexual abuse disclosure among patients diagnosed with a schizophrenia spectrum disorder and to examine whether there is a perceived need for training in this area among staff.

Aims

- To establish whether Community Mental Health Team members currently work with clients with severe mental illness affected by issues of sexual abuse
- To establish current practices within the team regarding the identification of sexual abuse among clients with severe mental illness
- To establish whether team members currently work on abuse related issues with clients diagnosed with a schizophrenia spectrum disorder
- To establish whether team members see working on abuse related issues with clients diagnosed with a schizophrenia spectrum disorder as part of their role
- To establish what the perceived needs are for training staff to work with this group
- To establish whether there are any staff who would like to develop their specialized interest in this area

Methodology

The Team Leader of a community mental health team in Glasgow was contacted to inform her of the purpose of this research project and to obtain her consent to contact other staff members. Following this, all staff members working within the community mental health team were contacted by mail (see appendix 1.2), to explain the purpose of the study, an information sheet (see appendix 1.3), two consent forms (see appendix 1.4), the survey questionnaire (see appendix 1.5) and a pre-addressed envelope for return within internal mail. Those who did not respond to the survey by the prescribed date in the letter were sent one more postal reminder. Seventeen members of staff from various professions including nursing, psychiatry, and occupational therapy were surveyed. Prior to surveying the staff at the Community

Mental Health Team, the questionnaire was piloted among clinical psychologists working in various community mental health teams across the south of Glasgow.

The survey questionnaire was developed to cover a number of areas pertinent to working with childhood sexual abuse in a severe mental illness population. Staff were asked to provide details of the number of cases on their current caseload, the number of cases with a diagnosis of a schizophrenia spectrum disorder, and the number of cases with a diagnosis of a schizophrenia spectrum disorder with an identified history of childhood sexual abuse. Staff were required to report on their current practices regarding sexual abuse in this population, and the handling of a disclosure of abuse (whether staff work on issues of abuse or refer clients to another agency for input on these issues) was also examined. Attitudinal questions regarding whether staff feel it is part of their role to work on abuse issues in this client group were included in the questionnaire as well as factual questions relating to staff experiences of training with regards to sexual abuse issues. In order to facilitate the coding of responses, replies to questions were restricted to Yes/No responses or closed questions that offered a range of set responses. A section was also included in the questionnaire for any additional comments staff may have regarding working in this area.

For ethical reasons, it was well communicated to staff that all responses to the survey would remain anonymous within the presentation of findings and also to ensure that all staff member have the same understanding of the issues being examined when responding to the survey, an operational definition of sexual abuse was included at the start of the postal survey. Following a brief review of the literature, the definition of

sexual abuse used was Brown and Turk's (1992) definition: "Sexual abuse occurs where sexual acts are performed on, with or sometimes by someone who is unwilling or unable to consent to those acts, or who has been unduly pressurized into consenting within an unequal relationship."

Analysis

Standard descriptive statistics were used.

Results

This survey was sent to 17 staff members based at a Community Mental Health Team in Glasgow. Thirteen staff members from varying disciplines responded to the questionnaire, a response rate of 76%. Of these respondents, 8 (62%) were female and 5 (38%) were male.

All 13 respondents (100%) reported that they had worked with clients diagnosed with a schizophrenia spectrum disorder affected by issues of sexual abuse. The mean number of cases on staff caseloads was 30.3, with an average of 17 cases having a diagnosis of a schizophrenia spectrum disorder. The mean number of cases with a diagnosis of a schizophrenia spectrum disorder and an identified history of sexual abuse was reported to be 1.8 cases. On average, 5.9% of community mental health team staff's total caseload comprises clients diagnosed with a schizophrenia spectrum disorder affected by issues of childhood sexual abuse.

With regards to staff's current practices, only 2 (15%) respondents reported routinely enquiring about sexual abuse. Of the staff who do not routinely enquire, 3

respondents (27%) advised their practice is dependent on the mental state of the client. If the patient is actively psychotic, for example, issues relating to childhood sexual abuse are not regarded to be a priority.

INSERT TABLE 1 ABOUT HERE

As shown in Table 1.1, 5 respondents (38%) reported being in favour of universal screening for sexual abuse at the assessment stage.

11 staff members (85%) reported that when a disclosure of abuse is made they would refer to an external agency for input relating to the abuse issues.

INSERT TABLE 2 ABOUT HERE

Of the 11 respondents who refer clients to another agency, 10 estimated the frequency of referral to be 'sometimes'. Only one respondent reported that they 'often' refer to another agency. Additional comments provided by staff would appear to suggest that their decision to refer depends on both the client's mental state and wishes. Despite their tendency to refer elsewhere, 9 respondents (69%) felt it is a part of their role to work on sexual abuse issues with clients diagnosed with a schizophrenia spectrum disorder.

Staff were asked to report what type of agency they would use, if they referred elsewhere.

INSERT TABLE 3 ABOUT HERE

As Table 1.3 shows referrals were made to a number and variety of agencies. The most frequently used service for such clients is clinical psychology and 4 members of staff reported using more than one agency. There is a relatively even split between the number of NHS agencies and voluntary agencies to which referrals are made.

With regards to training, of the 13 respondents, 9 (69%) reported to have received training specific to working with issues relating to sexual abuse. All 9 respondents had received their training 'over a year ago' with only 4 staff having received training that comprised 'over a day.' It was found that agencies outside the NHS provided 67% of this training compared to 33% by NHS services.

Generally, staff agreed with what sexual abuse training should cover (see Table 1.4.) They strongly agreed that training should cover 'What is sexual abuse' as well as 'Skills development', 'Treatment/ Interventions', and 'Opportunities to receive supervision'. The survey found that 4 (31%) of the staff reported they did not know whether 'Dealing with legal aspects' was pertinent to training on issues relating to sexual abuse. The survey found that 10 respondents (77%) would like to attend training on sexual abuse, with 9 of these 10 reporting to have a particular interest in working with clients affected by issues of sexual abuse.

INSERT TABLE 4 ABOUT HERE

Additional space was included in the questionnaire for staff to provide any additional comments they may have on working in this area. Of the 13 completed responses, only 5 respondents (38%) included any qualitative data, which was insufficient to provide a comprehensive data analysis.

Discussion

Despite a busy workload, most of the staff surveyed returned completed surveys, with some individuals taking extra time to give additional information regarding their current working practices. This high rate of return for a postal survey may be indicative of the interest of staff in this area or potentially an expression of the perceived need for training to work with issues relating to abuse in the severe mental illness population. The survey found that all community mental health team staff that returned the completed questionnaire came into contact with clients diagnosed with a schizophrenia spectrum disorder affected by issues of sexual abuse during the normal course of their work. It was found that these issues comprised a considerable proportion of staff's caseloads, and that most staff felt that it was part of their role to work on abuse issues with this group. However given the relatively small numbers surveyed, future projects could focus on a multi-site project to increase power and to compare practices and opinions across various staff groups. It would be interesting to analyse differences between the varying professions and a larger scale study, perhaps incorporating a telephone survey to increase the participant response rate, could comprise future stages in the process of auditing this area.

With regards to current practices within the community mental health team, the survey found that the majority of staff do not routinely enquire about sexual abuse

with clients with severe mental illness and that they are not in favour of universal screening for abuse at the assessment stage. However all staff responding to the questionnaire routinely record any disclosure of abuse in client's casenotes. Furthermore, the survey found that when staff identify individuals with a schizophrenia spectrum disorder who have been affected by issues relating to a history of sexual abuse, they tend to refer on to other agencies and that only a small proportion of staff feel they can treat these clients themselves. This was qualified by additional comments given by some staff who stated that the decision to refer depended on the needs of the individual clients and the circumstances of disclosure. It is anticipated that the team will consider the results of this audit as part of a review of their practices in terms of personal development and training, or assessment procedures and perhaps implement local guidelines regarding the management of abuse disclosures among this population. Further audit could then be completed to measure the effectiveness of and practice or policy changes implemented.

The survey found that very few staff members had received training to work with issues relating to sexual abuse. The survey has already established that staff do work with these individuals, but it does not appear that the majority of staff have received any specialist training. It has already been noted that appropriate responses are essential for the psychological care of these individuals, and the findings suggest that the staff are aware that they are in need of further training to work effectively with this client group.

Finally, the majority of staff expressed a particular interest in working with this group. This is a positive finding, reinforcing the suggestion that staff appreciate the

contribution that abuse can have to the deterioration of their client's mental health. It also reinforces the findings that staff at this community mental health team, through their response to this survey, perceive a need for further training to work with such individuals affected by abuse related issues. In-service training certainly could be an area which the team could review following this project. The provision of such training, either internally or by an external agency, would facilitate future audit projects.

Conclusions

Community mental health team staff work directly with clients with schizophrenia spectrum disorders affected by issues relating to histories of childhood sexual abuse as part of their usual caseload. However staff do not routinely enquire about sexual abuse with this population and are not in favour of universal screening for abuse at the assessment stage. Staff generally agree that it is part of their role to work with these clients, and many report that they would like the opportunity to receive further training to facilitate work with these clients. Overall, staff indicated that they perceive a need for specialist training to work with this population and many indicated a specialist interest in working with this population.

References

Ainscough, C., & Toon, K. (1996). *Breaking Free: Help for Survivors of Child Sexual Abuse*. England: Sheldon Press

Briere, J., & Zaidi, L.Y. (1989). Sexual abuse histories and sequelae in female psychiatric emergency room patients. *American Journal of Psychiatry*, 146, 1602-1606.

Bryer, J.B., Nelson, B.A., Miller, J.B., & Krol, P.A. (1987). Childhood sexual and physical abuse as factors in adult psychiatric illness. *American Journal of Psychiatry*, 144 (11), 1426-1430.

Campbell, J.A., & Carson, K. (1995). Training and knowledge of professionals on specific topics in child sexual abuse. *Journal of Child Sexual Abuse*, 4, 75-87.

Evrill, J., & Walker, G., (1994). Disclosure of sexual abuse and psychological adjustment in female undergraduates. *Child Abuse and Neglect*, 19 (1), 93-100.

Finkelhor, D. (1994). Current information on the scope and nature of child sexual abuse. *The future of children*, 4 (2), 31-53.

Friedman, S., & Harrison, G. (1984). Sexual histories, attitudes and behaviour of schizophrenic and normal women. *Archives of Sexual Behaviour*, 13, 555-567.

Jacobson, A., & Herald, C., (1990). The relevance of childhood sexual abuse to adult psychiatric inpatient care. *Hospital and Community Psychiatry*, 41, 154-158.

Jacobson, A., & Richardson, B., (1987). Assault experiences of 100 psychiatric inpatients. Evidence of the need for routine enquiry. *American Journal of Psychiatry*, 144, 508-513.

Kelley, S., (1988). Professionals' attitudes towards childhood sexual abuse. *Nursing Times*, 84 (1), 56.

Lundberg-Love, P.K., Marmion, S., Ford, K., Geffner, R., & Peacock, L., (1992). The long term consequences of childhood incestuous victimization upon adult women's psychological symptomatology. *Journal of Child Sexual Abuse*, 1, 81-102.

Meuser, K.T., Rosenberg, S.D., Goodman, L.A., Trumbetta, S.A., (2002). Trauma, PTSD, and the course of severe mental illness: an interactive model. *Schizophrenia Research*, 53, 123-143.

Mullen, P.E., Martin, J.L., Anderson, J.C., Romans, S.E., & Herbison, P., (1993). Child sexual abuse and mental health in adult life. *British Journal of Psychiatry*, 163, 721-732.

Read, J., (1997a). Child abuse and psychosis: A literature review and implications for professional practice. *Professional Psychology: Research and Practice*, 28, 448-456.

Read, J., (1997b). Child abuse and severity of disturbance among adult psychiatric inpatients. *Child Abuse and Neglect*, 22 (5), 359-368.

Read, J., & Fraser, A., (1998a). Abuse histories of psychiatric inpatients: To ask or not to ask. *Psychiatric Services*, 49, 355-359.

Read, J., & Fraser, A., (1998b). Staff response to abuse histories of psychiatric inpatients. *Australian and New Zealand Journal of Psychiatry*, 32, 157-164.

Sasonnet-Hayden, H., Haley, G., Marriage, K., & Fine, S., (1987). Sexual abuse and psychopathology in hospitalised adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 26, 753-757.

Shearer, S.L., Peters, C.P., Quaytman, M.S., & Ogden, R.L., (1990). Frequency and correlates of childhood sexual and physical abuse histories in adult female borderline inpatients. *American Journal of Psychiatry*, 147, 214-216.

Swett Jr, C., Surrey, J., & Cohen, C., (1990). Sexual and physical abuse histories and psychiatric symptoms among male psychiatric outpatients. *American Journal of Psychiatry*, 147, 632-636.

Wurr, J.C., & Partridge, I.M., (1996). The prevalence of a history of childhood sexual abuse in an acute adult inpatient population. *Child Abuse and Neglect*, 120, 867-872.

Table 1: Current practices regarding identification of sexual abuse among CMIIT staff

	Number and Percentage of staff responding yes	Number and Percentage of staff responding no
Do you routinely ask about sexual abuse?	2 (15%)	11 (85%)
Are you in favour of universal screening for sexual abuse at the assessment stage?	5 (38%)	8 (62%)

Table 2: Current practices when staff identify clients who have experience abuse

Treatment chosen for client	Number of staff selecting treatment
Treat client themselves	1
Referral to other agency	11
Both	1

Table 3: Agencies used by staff for clients affected by issues of sexual abuse

Referral agencies used by staff for clients affected by sexual abuse	Number of staff members using this service
<i>NHS Agencies:-</i>	
Psychology	6
Counselling	2
Sandyford Centre for Women's Health	3
Total	11
<i>Voluntary Agencies:-</i>	
Breakthrough for Women	4
Women's Aid	1
Unnamed Agency	1
Total	6

Table 4: Extent to which staff agree with the proposed content of training for sexual abuse

Content	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
What is sexual abuse	11 (85%)	2 (15%)	0	0	0
Skills Development	10 (77%)	3 (23%)	0	0	0
Dealing with legal aspects	4 (31%)	5 (38%)	4 (31%)	0	0
Treatment/ Intervention	8 (62%)	5 (38%)	0	0	0
Opportunities to receive supervision	8 (62%)	5 (38%)	0	0	0

Chapter 2: Systematic Literature Review

Maternal Depression and Infant Weight Faltering: A Systematic Review of the Literature

Joanne Robertson

Prepared in accordance with requirements for submission to Child Development

*Submitted in partial fulfilment of the requirements for the degree of Doctor of Clinical
Psychology.*

***Address for Correspondence:**

**Joanne Robertson
Section of Psychological Medicine
Division of Community Based Sciences
University of Glasgow
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow G12 0XH
Tel: 0141 211 3920
Fax: 0141 357 4899
E-mail: 9608041r@student.gla.ac.uk**

Abstract

Background: There is evidence to suggest that maternal psychiatric status has an adverse affect on children's developmental outcomes. Clinically, it has been assumed that maternal depression has an impact on infant growth and related conditions such as infant weight faltering. The purpose of this review was to systematically review the quality of the evidence for an association between maternal depression and infant weight faltering.

Methodology: The search strategy involved a computerised search of all major health care databases using key terms to identify papers suitable for review. Criteria assessing methodological quality were tailored to the investigation of maternal depression in infant weight faltering using 'SIGN' guidelines (SIGN, 2004.)

Results: A total of 10 articles were identified for inclusion. The review provides limited support for an association between maternal depression and infant weight faltering, with this association being of more significance within developing countries. Limitations of the current literature are discussed and suggestions for future research are proposed.

Discussion: Methodological issues within the literature are highlighted and the mechanisms mediating the association between maternal depression and infant weight faltering are discussed. Conclusions regarding future research implications are drawn.

Keywords: infant weight faltering, maternal depression, postnatal depression, postpartum depression

Introduction

Faltering weight gain in infancy, traditionally called 'failure to thrive', is a common paediatric presentation. Clinical cases usually present around 1 year old during the weaning period when children are either below the third percentile for weight or have shown progressive weight loss and fallen down the percentile chart by at least two bands (Batchelor, 1999.) Prevalence rates have been estimated at between 3-4% in the community and there has been a continuing difficulty to establish the precise aetiology of the problem (Douglas, 2002.) Indeed theories of the aetiology of weight faltering increasingly reflect the complex interaction between organic, developmental, and social factors (Chatoor, 1997.)

The notion of 'maternal psychopathology' has been prominent in traditional theorising about the syndrome. Researchers have described maternal characteristics such as severe depression (Evans et al, 1972), personality disorder and chronic anxiety (Fischhoff et al, 1971), substance abuse and psychotic stress reactions (Jacobs and Kent, 1977), narcissism (Ayoub and Milner, 1985) and adjustment disorders (Chatoor et al, 1985.) These studies, almost entirely derived from clinical impression, are characterised by a lack of methodological rigour, which typifies the majority of early research in the field. The marked discrepancy between early and more recent research in this area has been previously noted with early uncontrolled studies tending to find a dramatic incidence of maternal psychopathology, but later investigators, using improved methodologies, finding little evidence of psychological differences between parents of weight faltering children and their comparisons (Boddy and Skuse, 1994.)

However, there is good evidence that parental psychiatric disorder constitutes a risk factor for disturbances in child development (Rutter, 1989.) A number of possible reasons for this have been suggested. First, there may be a direct pernicious impact on the child of exposure to the psychiatric disorder. Second, there may be an indirect impact via the effect of the parental disorder on interpersonal behaviour in general and parenting in particular. Finally, the impact may be via third factor variables, such as social adversity commonly associated with psychiatric disorders, or genetic or constitutional factors (Rutter, 1989)

Depression arising in the postnatal period could have an impact on infant development via each of these pathways. The infant's extreme dependency on their caretaker, their sensitivity to interpersonal contacts, and the fact that, in the great majority of cases, the mother constitutes the infants primary environment in the first postnatal months, make the question of the impact of depression at this time of particular importance (Murray and Cooper, 1997.)

There is evidence for an association between post-partum depression and a number of indices of adverse child outcomes. Deficits in early interactions and cognitive functioning have been found in infants of mothers with postnatal depression (Crutrone and Troutman, 1986; Whiffen and Gotlib, 1989; Lyons-Ruth et al, 1986, Murray, 1992.) A high rate of insecure attachment is also apparent (Murray, 1992.) Furthermore, there is also evidence for a longer term association. Cognitive development in the 4 year olds of mothers who have had postpartum depression appears compromised, at least in boys from

lower socioeconomic backgrounds, and there is an association with behavioural disturbance (Murray and Cooper, 1996.)

Postnatal depression affects around 10% of all mothers (Milgrom et al, 2004.) During postnatal depression, women suffer a cluster of depressive symptoms over extended periods (weeks, months or sometimes years: O'Hara and Zekoski, 1988.) The detrimental effects of PND on child development have been detailed in several small longitudinal studies (Cooper and Murray, 1997; Milgrom, Martin and Negis, 1999.) Meta-analyses of the available published data have found small but significant effects of PND on both emotional and cognitive child outcomes at 1 year of age (Beck, 1998.) Other researchers have recorded behavioural and social adjustment difficulties up to the 5th year of life including children's behaviour towards their mothers, the presence of behavioural disturbance at home and the social patterning of play at school (Murray et al, 1999.) The effects of PND may even persist into later childhood, such that 11 year old schoolchildren whose mothers were depressed 3 months post partum have been found to have lowered IQs, more attentional problems and greater difficulty with mathematical reasoning (Hay et al, 2001.) In addition, research has consistently found a strong association between maternal depression and infant temperament (McMahon et al, 2001.) It has been reported that aspects of neonatal temperament can influence maternal mood and maternal interactional style (Beck, 1996.) Conversely, others have found that maternal depression, child rearing practices, and early life events can themselves affect aspects of child temperament (DeVries and Sameroff, 1984.)

Given the prominence maternal depression has on adverse child outcomes, it is no surprise that researchers have been examining the role PND has in the aetiology of infant weight faltering. However, to date, no systematic literature review has been conducted to examine whether there is an association between maternal depression and infant weight faltering. The aim of the current review therefore is to evidence the relationship between infant weight faltering and maternal depression.

Methods

Objective

To investigate whether there is an association between infant weight faltering and maternal depression.

Search Strategy

A number of sources were used to identify studies for possible inclusion in the review. These included a search across the following electronic bibliographic databases:

CINAHL (1982-2006)

EMBASE (1980-date)

MEDLINE (1966-date)

PsychInfo (1974-date)

All EBM Reviews CDSR, ACP Journal Club, DARE, CCTR.

The electronic search used 8 key terms to reflect the main components of the systematic review question. The terms *postnatal depression*, *postpartum depression*, *maternal*

mental health, maternal psychopathology were all searched as key words. In addition, each key word was combined with each of the following terms: *growth faltering, weight faltering, infant growth, failure to thrive*. In order to evaluate the sensitivity of the search strategy, hand searches were conducted on pertinent journals and reference lists of retrieved articles. Journals included in the manual search included Paediatrics and British Medical Journal. An expert in the field of infant weight faltering (CMW) was also consulted to identify studies not captured by the searches.

Inclusion/ Exclusion Criteria

Studies were included which examined infant growth in the context of maternal depression. Included articles utilised standardised measures of maternal depression and infant weight faltering as outcome variables. Only articles written in English and which had been peer reviewed were considered for inclusion. Non-English, narrative, and single case studies were excluded as were non-systematic reviews, letters, Editorials, and proceedings of societies. Studies which used non-standardised measures for main variables of interest were also excluded.

Assessment of Methodological Quality

Guidelines used to assess the methodological quality of included studies were adapted from the Scottish Intercollegiate Guidelines Network (SIGN) (2004) guidelines for grades of recommendation for experimental and observational studies. The checklist was designed to cover the main methodological issues of study design, participants, measurement of confounds, and statistical analyses.

All included studies were rated on the 27 factor methodological quality guideline (Appendix 2.4) and were allocated a score for each of the criteria fulfilled. Possible scores ranged from 0 to 35, as higher weightings were given to important methodological items such as blinding of assessments, and were transferred into quality categories representing the overall percentage of quality criteria met:

A = \geq 75% (high quality – all or most of the criteria have been met)

B = 60-74% (moderate quality – an adequate number of the criteria have been met)

C = 50-59% (low quality – some of the criteria have been met)

D = \leq 49% (poor quality – few of the criteria have been met)

Given the small number of studies included in the review and lack of consistency in outcome measures, no meta-analytic techniques were conducted and a discursive review was considered to be more appropriate.

Reliability of Quality Rating

An independent assessor rated eight of the included studies and the index of agreement was 87% according to the category ratings (Cohen's Kappa co-efficient statistic = 0.8745; excellent inter-rater agreement) (Martin and Bateson, 1993).

Results

Outcome of Search Process

Eighteen papers were identified from the search strategy as potentially suitable for inclusion. Abstracts of these papers were evaluated using a pre-test structured proforma, designed to identify studies for assessment of inclusion criteria (see Appendix 2.2). The proforma was developed to reflect the main components of the review question including:

1. **Research Question:** Aimed at investigating the association between maternal depression and infant weight faltering
2. **Research Design:** Observational studies with concurrent controls, case-control studies and experimental studies without randomisation
3. **Outcome measures:** Are there standardised measures of infant weight faltering/
are there standardised measures of maternal depression?

The reviewer was not blind to the name of the author, institutions, journal of publication and results when inclusion criteria were applied. The search and selection process for this review are illustrated in Figure 1.

INSERT FIGURE 1 ABOUT HERE

As a result of the search process, 10 studies were retained for inclusion in the present review, 1 of which was identified by the hand search. A list of excluded studies (n=8) is outlined in Appendix 2.3.

Data Extraction

Data were extracted from each of the included studies to satisfy the objectives of the review. A summary of the data extracted for each of the studies is presented in table 1.

INSERT TABLE 1 ABOUT HERE

Methodological Quality of Studies

Of the 10 papers reviewed,

4 studies met criteria for an A quality rating: Anoop et al, 2004

Patel et al, 2003

Rahman et al, 2004

Ramsay et al, 2002

5 studies met criteria for a B quality rating: Baker-Henningham et al, 2003

Drewett et al, 2004

Gorman et al, 1993

O'Brien et al, 2004

Wright et al, 2006

1 study met criteria for a C quality rating: Tomlinson et al, 2006

No studies met criteria for a D rating, therefore the quality of papers examined in the review are considered to be of a low to high standard.

Of these, 6 were cohort studies (Drewett et al, 2004; Patel et al, 2003; Rahman et al, 2004; Ramsay et al, 2002; Wright et al, 2006; Tomlinson et al, 2006) and 4 case-control studies (Anoop et al, 2004; Baker-Henningham et al, 2003; Gorman et al, 1993; O'Brien et al, 2004;) which will each be reviewed in terms of methodological criteria guided by the rating scale.

Review of Findings

To examine the magnitude of the relationship between infant weight faltering and maternal depression, each article will be reviewed and individual attention being given to the methodological strengths of the literature. Given that the studies being reviewed are cohort and case-control in design, methodological strengths would include the utilisation of reliable assessment measures and designs which take into account possible confounding variables. In addition, assessments of maternal depression should be conducted blind to the health status of the infant. In studies where it is reported that there is blinding of assessments, a further methodological strength would be the reporting of rates of assessments conducted unblinded. Likewise, if high attrition rates are reported, it would be expected that a sensitivity analysis be completed to take account of this.

Cohort studies examining association between maternal depression and infant weight faltering

Patel et al (2003) examined the contribution of postnatal depression to poor growth and developmental outcomes in Goa, India, within a cohort study of 171 mother-infant dyads (37 depressed mothers and 134 healthy controls.) Infant growth was assessed using

weight-for-age z-scores and length-for-age z-scores with children being classified as weight faltering if their weight was below the 5th centile for age. Infant growth was recorded at recruitment (6-8 weeks of age) and at 6 month follow-up. Maternal depression was measured using the Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden, and Sagovsky, 1987) administered at recruitment with no follow up assessment. A cut-off of 11/12 on the EPDS (maximum score = 30) was used to identify cases of postnatal depression (PND.) The study demonstrated that postnatal depression was associated with significantly poorer growth outcomes at 6 months, even after adjustment for other determinants of poor growth such as low birth weight and low parental education.

This study benefited from the use of standardized outcome measures to assess the variables of interest and the authors consider several variables associated with poor growth as potential confounds within the design and analysis of findings. However, although assessment of developmental outcome was conducted blind, it was unclear whether maternal depression was measured blind to infant status introducing the possibility of observer bias. Moreover, there was no reporting of attrition rates and, despite a multiple regression model being used, there was no reporting of the r-squared change value of maternal depression on infant weight faltering. The population under study was not representative of all mothers in the study area as mothers whose pregnancies were complicated were excluded as were any mothers using private health care. In addition, the sample size was relatively small for a cohort study and it is possible

that there could have been an independent, unmeasured variable which may have influenced the results reported.

Rahman et al (2004) investigated maternal depression and infant weight faltering, using a birth cohort of 160 infants of depressed mothers and 160 infants of psychologically well mothers from a rural community in Pakistan. Infants were classified as weight faltering if their weight-for-age z-scores were less than -2 on the basis of National Center for Health Statistics/ World Health Organization Reference Data (Dibley et al, 1987.) Infant growth was measured at 2, 6, and 12 months post birth. Maternal depression was assessed via Schedules for Clinical Assessment in Neuropsychiatry interviews (SCAN) (WHO, 1994) completed in the 3rd trimester of pregnancy and at 2, 6, and 12 months postpartum. Findings suggested that infants of prenatally depressed mothers showed significantly more growth retardation at all time points and that chronic depression carried a greater risk for poor outcome than episodic, with these associations remaining significant after adjustment by multivariate analysis.

The study benefited from being a longitudinal population based study, free from referral bias, which used standardized outcome measures of maternal depression and infant weight faltering. Maternal depression was assessed blind to the health status of the infant and all infant outcomes were assessed by researchers blind to the psychiatric status of the mother, limiting the possibility of observer effects influencing results. The authors also identified a number of possible confounding factors within the design and analysis of the study which were incorporated in a multiple logistic regression model. The study also

benefited from a high follow up rate and by determining the exposure prior to the development of outcomes, the study ensured the correct temporal sequence was achieved. However, the authors do not report rates of unblinded assessments and no r-squared change value is described. In addition, the study excluded mothers with severe depression which limits the ability of the study to draw conclusions regarding the impact of severe mental ill health.

Ramsay et al (2002) examined the relation of neonatal sucking to later feeding, postnatal growth, maternal postpartum depression, and infant feeding practices. The study aimed to identify non-organic failure to thrive (NOFT) in a cohort of healthy infants followed from birth as well as attempting to objectively measure neonatal sucking ability, later feeding ability, maternal depression and compensatory feeding practices. Using a sample of 202 infants with efficient sucking (controls) and 207 with inefficient sucking (index), NOFT was defined as the absence of any organic disease with at least 2/3 of the following conditions: 1) a relative weight loss across 2 or more major centile lines (which included the 50th centile) on the NCHS charts between any 2 or 3 testing dates: any 2 dates being 4 months apart; 2) weight for recumbent length below 90% of ideal body weight adjusted for parental stature (Himes et al, 1985); and 3) weight for age below 5th centile. Infant growth and maternal depression, measured via the EPDS with a cut-off of 12+, were assessed at 2, 6, 10 and 14 months. The study found that 5% of infants within the whole sample showed a downward shift in growth, who on the basis of physical criteria alone could be called NOFT. In terms of maternal depression, it was found that postnatal growth was not influenced by early or concurrent maternal depression and that

mothers with postpartum depression were more likely to use compensatory feeding strategies than non-depressed mothers.

Methodological strengths of this study were the use of psychometrically reliable and valid measures which were carried out blind to the health status of the infant. The prospective design allowed researchers to follow the evolution of failure to thrive without the pitfalls of seeking associations and relations from a retrospective view. The rate of NOFT found is similar to that of the general population however the clinical picture in this group was different to the traditional underdeveloped and under healthy image of failure to thrive. This is most probably attributable to the authors controlling for medical factors by choosing healthy infants with good birth weight and minimal birth complications. This study also benefited from low attrition rates, although parents of index infants, who had higher incomes, were more likely to continue with the study. It is possible that mothers with greater interest in their infants health entered the study, accounting for the higher mean weights of infants observed. It is also possible that the Hawthorne effect may have been operating in this study i.e. that maternal feeding practice may have changed as a direct result of study participation. However, as questions regarding feeding were both direct and indirect and that all mothers received equal attention in terms of number of visits and number of questions posed, it is likely that the effect of any such bias would be minimized. Nonetheless, the sample size of NOFT infants (n=10) was small and a larger sample and longer follow up may have permitted a clearer picture of postnatal growth.

Drewett et al (2004) examined the relationship between failure to thrive in preterm and term infants and postnatal depression in their mothers in a large population based cohort study. Using a whole population birth cohort (n= 12391), infants with weight faltering were identified as those whose weight gain put them in the slowest growing 5% over the period from birth-9 month, as identified using a conditional weight gain criterion (Cole, 1995; Wright et al, 1994.) Maternal depression was assessed on four occasions – 18 weeks and 32 weeks of pregnancy and 8 weeks and 8 months post birth – using the EPDS with a cut-off of greater than or equal to 12 to identify PND. Results demonstrated that high depression scores in the postpartum period were not themselves associated with a higher prevalence of failure to thrive, either in infants born at term or in those born preterm.

The use of psychometrically reliable and valid outcome measures and the large sample size under study enhance the methodological quality of this study. The long follow up period also strengthens the studies findings regarding infant growth. The conditional weight gain criteria used to identify relevant cases takes into account a measure of intrauterine growth and as such represents a more robust assessment of infant growth. However, it was unclear whether maternal depression assessments were conducted blind to infant health status introducing possible bias. Likewise, although it was reported that a “wide range” of social and biological variables were recorded during pregnancy, details of these demographics were not explicitly reported and only home ownership, having the use of a car, number of living children, ordinal position, parental height, and crowding were considered within the statistical analyses. Nonetheless, as results came from a

whole population birth cohort and identification of cases was made de novo, it is unlikely that the study is subject to any major sampling biases. Furthermore, given the large numbers under investigation it would appear unlikely that an association of any magnitude would have been overlooked.

Wright et al (2006) examined the influence of maternal socioeconomic and emotional factors on infant weight gain and weight faltering in the first year of life, in a cohort study of 923 infant-mother dyads. Weight faltering in this study was defined for any time interval as weight gain (Thrive Index) below the 5th centile, and this was defined as sustained if weight faltering was present in 2 or more of the 4 age bands under investigation. A Thrive Index is a measure of change in weight standard deviation over time, to allow for regression to the mean (Wright et al, 1994.) The EPDS administered at 2-3 months was used to assess maternal depression while infant growth was measured at 1-2, 3-6, 7-9, and 10-18 months following birth. The authors reported finding only limited evidence that maternal characteristics influenced infant weight gain or predisposed infants to weight faltering. Specifically, the results suggested a transient effect of depression on infant weight gain that did not persist to the end of the first year of life. Infants of mothers with high depression symptom scores, for example, were more than twice as likely to have weight faltering up to 4 months of age, but there were no differences from the remainder of the cohort by the age of 1 year.

The study benefited from the use of standardized and well validated measures of both maternal depression and infant weight faltering. The measurement of weight gain and

weight faltering used is a conditional approach that reliably isolates postnatal from intrauterine growth providing a stronger measure of infant growth. Likewise, the large sample size and long follow up period enhanced the methodological quality of this study. However, it was unclear if the assessment of maternal depression was made blind to the infant's health status and although the current study achieved reasonable retention rates, it is possible that some of the most troubled mothers and families were lost to the study, reducing its power to detect the impact of extreme mental ill health. In addition, the higher attrition rates among the most deprived families reduced the power of the study to assess possible effects in extremely deprived families.

Tomlinson et al (2006) examined the association between maternal postnatal depression and infant growth in a South-African peri-urban settlement, using a sample of 147 mother-infant dyads. Infant weight was assessed using infant age-sex standardized weights calculated using updated Tanner scales (Tanner et al, 1987), although it is unclear which criteria were being used to define cases as weight faltering. Infant weight and length were recorded at 2 and 18 months of age but it is unclear when maternal depression was assessed. Maternal depression was measured using the depression section of the SCID (Spitzer et al, 1992) with a clinical psychologist making a clinical decision as to whether DSM-IV major depression was present or absent. The authors reported no clear effect of postpartum depression on infant growth, although maternal depression at 2 weeks was found to be associated with lower infant weight at 18 months. This effect disappeared when birth weight was considered.

It was unclear from this article whether maternal depression was assessed blind to infant health status and the loss of 33% to follow up introduced potential bias to the results. No sensitivity analysis to missing data was reported. Furthermore, no potential confounding variables were identified and considered in the design and analysis of this study. As the numbers of women who met the threshold for assessment of maternal depression and the numbers of infants with small infant size at 18 months were relatively small, this study lacks the power to test the hypothesis under investigation.

Case-Control Studies examining association between maternal depression and infant weight faltering

Anoop et al (2004) investigated current and postpartum maternal depression as a risk factor for weight faltering in a sample of 72 index children in rural South India and 72 controls matched for age, gender and residence. Cases were identified as infants with weight between 50-80% of expected weight for age based on the Indian Academy of Pediatric Grading Norms (Metha, 1999) whereas controls were infants with >80% weight for age. Maternal depression was measured by administration of the Structured Clinical Interview for DSM-IV-R (Spitzer, Williams, and Gibbon, 1992), although it is unclear at which time point this was administered. Results indicated major depression in the postpartum period, current major depression and low maternal intelligence were associated with weight faltering in the child. The severity of weight faltering was also significantly associated with major depression during the postpartum period and low maternal intelligence.

This study benefited from the use of reliable and valid outcome measures with the assessment of outcome being completed blind to infant status. The authors also used multivariate analysis to exclude confounds and the refusal of consent for the study was low, therefore minimizing the risk of participation bias. In addition, cases and controls were selected using the same framework with similar exclusion criteria to minimize the risk of sampling bias. However, there is no reported rates of unblinded assessments and no reported attrition rates. The authors also failed to report the r-squared change value for the effect of maternal depression on infant weight faltering despite utilizing a multiple regression model.

Baker-Henningham et al (2003) compared the mothers of weight faltering children with mothers of adequately growing children on measures of maternal depression, parenting self-esteem, social support and exposure to stressors, and to determine if these variables were independently related to undernutrition and stimulation provided in the home after controlling for socio-economic status. In a sample of 139 mothers of undernourished children and 71 controls, weight faltering was identified as weight-for-age z-scores of $-2z$ on NCHS references. Maternal depression was assessed using a scale based on the Centre for Epidemiological Studies Depression Scale (Radloff, 1977) plus three questions from the Maternal Morale Index (Salt et al, 1988; Galler & Harrison, 2000.) It was unclear from the article when depression was assessed. Results of the study indicated mothers of weight faltering children were more depressed, had lower levels of parenting self-esteem, reported higher levels of economic stress and provided a less stimulating home environment. After controlling for social background variables, there was no

independent relationship between either psychosocial function and home stimulation and nutritional status, with weight faltering being explainable by socio-economic factors.

All measures used in this study achieved good inter-observer reliability and good test-retest results. The authors considered a number of potential confounding variables which were considered within the multiple regression analysis. However the authors did not describe the r-square change value for maternal depression and infant weight faltering and it was unclear from the study whether assessment of maternal depression was blind to infant health status. In addition, 'depression'; in this study refers to the frequency of depression symptoms rather than a diagnosis of clinical depression, so mothers with high depression scores may not have actually been clinically depressed. Moreover, mothers in the sample all came from poor neighbourhoods with limited economic variance which limits the power of this study to detect associations within other economic backgrounds.

O'Brien et al (2004) investigated the association between faltering growth and maternal postnatal depression in a sample of 196 index and 567 control infant-mother dyads. Cases were identified as having serial weights that crossed 2 major centiles on standardized growth charts or that fell below the 2nd centile. Maternal depression was assessed using the EPDS with a cut-off of greater or equal to 9. If this threshold was exceeded, the revised Clinical Interview Schedule (CIS-R) (Lewis, Pelosi, Araya, and Dunn, 1992) was used to assess for a diagnosis of maternal depression. This study found that depression in mothers of children with faltering growth during the first 2 years of life is significantly greater than in mothers of children gaining weight appropriately.

This study benefited from the use of psychometrically valid and reliable assessment measures with the assessment of outcome being made blind to the health status of the infant. However, the study utilized a health visitor referred population introducing the possibility of referral bias. In addition the study has a low response rate (63%) with 95% of these families being visited. There was no reporting of unblinded assessments and no sensitivity analysis to missing data. Furthermore, although the authors reported on potential demographic confounds, they failed to consider these within their statistical analysis which comprised t-tests to compare group means.

Gorman et al (1993) compared current psychosocial functioning of a group of mothers with infants with NOFT (n=20) and a group of matched controls (n=23.) NOFT was identified if infants demonstrated: 1) weight at or below the 5th centile based on norms; 2) the absence of major organic condition or chronic illness, and 3) a decrease in rate of weight gain from within normal limits at birth to below the 5th centile. Results indicated that the mothers of NOFT infants reported more current depressive features on the Beck Depression Inventory (Beck, 1967) (BDI) than the comparison group mothers. Details were not reported as to when the BDI was completed by mothers but the mean age of the infants at study onset were 9.1 months (4.8 SD) for cases and 8.8 (4.8 SD) for controls.

This study benefited from the use of standardized outcome measures but failed to take into account any confounding variables which may have biased results. In addition, all mothers were of African-American race and from a low socio-economic stratum which limits the external validity of the study. The sample was obtained via hospital referrals

introducing the possibility of referral bias and the interviewers were not blind to the health status of the infants which could have potentially biased results. All data were collected via self report measures with no corroborative evidence being obtained from a third party. The findings may therefore be compromised by the reliability problems associated with self report measures (Bloom and Fischer, 1982.) The internal validity may also have been compromised by the small sample size and retrospective nature of the data.

Discussion and Conclusions

Overall, the present review provided limited support for an association between maternal depression and infant weight faltering. It demonstrated that studies investigating this relationship are scarce and their quality variable from high to low. Of the 10 studies identified and reviewed, five reported a positive association between the two variables of interest (Patel et al, 2003; Rahman et al, 2004; Anoop et al, 2004; O'Brien et al, 2004; Gorman et al, 1993.) One study reported a positive but transient relationship between maternal depression and infant weight faltering (Wright et al, 2006) and the remaining 4 studies reported no association (Ramsay et al, 2002; Drewett et al, 2004; Tomlinson et al, 2006; Baker-Henningham et al, 2003.) Positively, in terms of internal validity, all the studies reviewed utilized standardized outcome measures of maternal depression however there was little consistency in measures of outcome across the studies. In addition, only three studies were conducted blind and none of these reported rates of unblinded assessments (Ramsay et al, 2002; Anoop et al, 2004; O'Brien et al, 2004.) Two studies (Anoop et al, 2004; Gorman et al, 1993) used small sample sizes such that these studies

were likely to be underpowered and the duration of follow up in the all of the studies reviewed varied (range: prenatally to 18 months.) Despite regression models being used in most studies, no studies reported the r-squared change value for maternal depression on infant weight faltering and where high attrition rates were reported, no sensitivity analyses were conducted for missing data. This variation in what is done to whom, over what period and how outcomes are assessed introduces clinical heterogeneity and makes meaningful synthesis of results difficult.

It was noted in the course of the review, that a consistent methodological issue in the literature is the lack of a consistent definition of weight faltering with it being variably described as failure to thrive, undernutrition, and malnutrition. Two studies (Drewett et al, 2004; Wright et al, 2006) utilized a conditional weight gain criterion, a thrive index, to reliably separate postnatal growth from intrauterine growth for a stronger, more reliable measure of infant growth. The remaining studies utilized weight-for-age z-scores compared against various norms reference charts. This variation in the definition, measurement, and evaluation of infant weight faltering limits the ability to draw cross-study comparisons. It is perhaps an issue for future research to concentrate on a more concrete definition of weight faltering and for there to be a standardized process of identification and assessment of this condition. Indeed the results of Ramsay et al (2004) highlighted the necessity for a more focused definition of the condition which the current review would support to enhance the methodological quality of research in this area.

Similarly, a further issue which this review highlights is the assessment and evaluation of maternal depression. The articles reviewed cover a wide range of follow up periods from prenatal measures to follow up 18 months postpartum. Of the articles reporting a positive association, Rahman et al (2004) measured and found an association both prenatally and for chronic depression. The remaining articles reporting a positive association report this association to be postnatally with measurements of depression taking place at various time points. From this, it would seem reasonable to suggest that any relationship between weight faltering and maternal depression is likely to occur postnatally. However there were also disparities in the literature as to how depression was being defined and which diagnostic criteria were being used. As an illustration, O'Brien et al (2004) utilized the EPDS (Cox et al, 1987) as an assessment of maternal depression with a cut-off score of 9 being indicative of depressive symptomatology. Ramsay et al (2002) also used the EPDS but applied a threshold criterion of 12 to evaluate the presence of maternal depressive symptoms. This indicated levels of depression were varying across studies and such disparity within the literature limited the extent to which conclusions could be drawn across studies and again hindered the evidencing of any causal relationship.

Despite this, the current review does support an association between maternal depression and infant weight faltering, although this relationship is likely to be complex. A principal question that arose from the review was in relation to mechanism mediating the association between maternal mood disorder and adverse infant growth. The impact of PND on other measures of child development – cognitive development, emotional and social functioning – is well documented (Murray and Cooper, 1996.) In a review of

studies examining the impact of PND on child outcomes, Murray and Cooper, 1996 concluded that it was the impaired patterns of interaction occurring between mother and child in the context of depression, rather than the child's exposure to depressive symptoms per se, that is important to the child's functioning (Murray and Cooper, 1996.) In studies of mother-infant interaction and PND, considerable variation in the style of maternal engagement and maternal responsiveness to the infant have been found. Depressed mothers speak less, and are less responsive, present a 'flat' affect and express more negative emotions (Frankel and Harman, 1996; Righetti-Veltema, Conne-Perread, Bousquet, and Manzano, 2002.) Impairments in the face-to-face engagements of depressed mothers have not only been found to be associated with immediate signs of behavioural disturbance in the infant, but they also appear to mediate some of the longer term adverse child outcomes associated with postpartum depression (Murray and Cooper, 1996.) Given that infant weight faltering occurs in a "feeding relationship" (Chatoor, 2000) disrupted mother-child interaction must be considered a possible mechanism to explain an association between maternal depression and infant weight faltering. Indeed it has been suggested that maladaptive feeding patterns such as infant weight faltering, arise because dysfunctional relationship patterns lead to inconsistency in feeding and/ or conflict at mealtimes (Drotar, 1991.) This would seem to suggest that further exploration of parent-child interaction at mealtimes would inform an understanding of the nature of the problem in the parent-child relationship in infant weight faltering which this review would recommend.

Interestingly, of the 10 studies reviewed, five were conducted in the developing world (Patel, et al, 2003; Rahman et al, 2004; Tomlinson et al, 2006; Anoop et al, 2004; Baker-Henningham et al 2003.) Despite relative improvement in living conditions and the availability of modern healthcare, infant mortality rates continue to be very high in many developing countries (Rahman, Harrington, and Bunn, 2002.) Research shows that disorders such as depression are highly prevalent in developing countries, with reported prevalence rates of 25% for men and 66% for women in rural Pakistan (Mumford et al, 1997.) In the current review, four of the developing world studies reported a positive association between maternal depression and infant weight faltering (Patel, et al, 2003; Rahman et al; 2004; Anoop et al, 2004; Baker-Henningham et al, 2003.) It has been suggested that possible mechanisms by which maternal depression affects infant growth in developing countries include a less healthy lifestyle and reduced care-seeking in the prenatal period; maternal disability in the postnatal period resulting in deficient physical and emotional care and psychosocial stimulation of the infant; and associated psychosocial difficulties such as lack of family support to the mother and lack of financial empowerment, which could impact on infant care (Rahman, Harrington and Bunn, 2002). In the study by Rahman et al (2004) it was found that infants of depressed mothers were less likely to be fully immunized at 12 months, possible indicating a lack of appropriate health-seeking behaviour in depressed mothers. Likewise, this study found that infants of depressed mothers had more diarrhea episodes but the same rate of Acute Respiratory Infections. Maternal child care behaviours such as hand-washing before feeding, safe food preparation and storage, and obtaining clean drinking water are more likely to influence diarrhea than ARI (Thongkrajai et al, 1990.) Depressed mothers in

developed countries have been observed to provide less quantity and poorer quality of stimulation for their infants (Bettes, 1998) and to be slower in responding and less responsive to them (Livingood et al, 1983; Field et al, 1990.) Depressed mothers are also more likely to have negative views of themselves as parents (Goodman et al, 1993), seeing themselves as having less personal control over their child's development, and less able to positively influence their children (Kochanska et al, 1987.) It might therefore be expected that in developing countries these symptoms could influence maternal care behaviours which in turn could increase the child's susceptibility to illness (Rahman et al, 2002.)

Another potential mechanism linking maternal depression with physical morbidity in infants is through its links with negative life events and chronic psychosocial difficulties. There is evidence that depressed mothers can act in ways that increase the risk that their children will experience adversity. For example, longitudinal research suggests that children of depressed mothers are exposed to much greater numbers of stressors, such as familial discord, than the children of non-depressed mothers (Hammen et al, 1987.) Evidence also suggests poorer psychosocial functioning in mothers of weight faltering children with mothers having more chronically disrupted lives, unsupportive partners, and fewer social contacts (Kerr et al, 1987.) It has also been reported that that slow growth in childhood is associated with family conflict and that this is independent of socioeconomic circumstances (Montgomery et al, 1997.)

For clinicians working in the field it is important to recognize the complexity of the relationship between infant weight faltering and maternal depression. Routine screening for PND in mothers of infants with weight faltering conditions would be recommended as would an increased awareness of possible mediating factors in this relationship. Assessment should take account of a wide range of factors including parental psychosocial functioning, parental health-seeking behaviours, parental attitudes to both their parenting abilities and the infants condition, and parenting skills as these are potential variables which could be moderated via clinical psychology intervention. However, perhaps most important is the need to be able to assess parent-child interaction effectively within this population which the current review recommends should be the immediate focus of future research in the area.

References

Anoop, S., Saravanan, B., Joseph, A., Cherian, A., & Jacob, K.S. (2004). Maternal depression and low maternal intelligence as risk factors for malnutrition in children: a community based case-control study from South India. *Archives of Childhood Disease*, 89: 325-329.

Ayoub, C.C., & Milner, J.S. (1985). Failure to thrive: parental indicators, types, and outcomes. *Child Abuse and Neglect*, 9: 491-499.

Baker-Henningham, H., Powell, C., Walker, S., & Grantham-McGregor, S. (2003). Mothers of undernourished Jamaican children have poorer psychosocial functioning and this is associated with stimulation provided in the home. *European Journal of Clinical Nutrition*, 57: 786-792.

Batchelor, J.A. (1999). *Failure to Thrive in Young Children: Research and Practice Evaluated*. London: The Children's Society.

Beck, A.T. (1967). *Depression: Clinical, Experimental, and Theoretical Aspects*. New York: Harper.

Beck C.T. (1996). A meta-analysis of the relationship between postpartum depression and infant temperament. *Nursing research*, 45: 225-230.

Beck, C.T. (1998). The effects of postpartum depression on child development: a meta-analysis. *Archives of Psychiatric Nursing*, 12: 12-20.

Bettes, B.A. (1988). Maternal depression and motherese: temporal and intonational features. *Child Development*, 59: 1089-1096.

Bloom, M., & Fischer, J. (1982). *Evaluating practice: Guidelines for the accountable professional*. Englewood Cliffs, NJ: Prentice-Hall.

Boddy, J.M., & Skuse, D.H. (1994). The process of parenting in failure to thrive. *Journal of Child Psychology and Psychiatry*, 35 (3): 401-424.

Chatoor, I. (1996). Feeding disorders of infants and toddlers. In S Greenspan, S Wieder and J Osofsky (Eds.), *Handbook of child and adolescent psychiatry, Vol. 1. Infants and pre-schoolers: Development and syndromes*. New York: Wiley, 367-386.

Chatoor, I. (2000) Feeding and eating disorders of infancy and early childhood. In Kaplan, H.I., & Sadock, B.J., (Eds.) *Comprehensive Textbook of Psychiatry, Vol VII*, Baltimore: Williams & Wilkins, 2704-2710.

Chatoor, I., Dickson, L., Schaeffer, S., Egan, J. (1985). A developmental classification of feeding disorders associated with failure to thrive: assessment and treatment. In D.

Drotar (Ed.) *New Directions in Failure to Thrive: Implications for Research and Practice*. New York: Plenum Press.

Cole, T.J. (1995). Growth monitoring with the British 1990 Growth reference. *Archives of Disease in Childhood*, 76, 47-49.

Cooper, P.J., & Murray, L. (1997). The impact of psychological treatment of postpartum depression on maternal mood and infant development. In L. Murray and P.J. Cooper (Eds.) *Post Partum Depression and Child Development*. London: Guilford Press, 201-220.

Cox, J.L., Holden, J.M., Sagovsky, R. (1987). Detection of postnatal depression: development of the 10 item Edinburgh postnatal depression scale. *British Journal of Psychiatry*, 150: 782-786.

Cutrona, C.E., & Troutman, B.R. (1986). Social support, infant temperament, and parenting self-efficacy: a mediational model of postpartum depression. *Child Development*, 57: 1507-1518.

DeVries, M.W., & Sameroff, A.J. (1984). Culture and temperament: influences on infant development in three East African societies. *American Journal of Orthopsychiatry*, 54: 83-96.

Dibley, M.J., Goldsby, J.B., Staehling, N.W., & Trowbridge, F.L. (1997). Development of normalized curves for the international growth reference: historical and technical considerations. *American Journal of Clinical Nutrition*, 46: 736-748.

Douglas, J. (2002). Psychological treatment of food refusal in young children. *Child and Adolescent Mental Health*, 7 (4): 599-626.

Drewett, R.M., Blair, P., Emmett, P., Emond, A., and the ALSPAC Study Team (2004). Failure to thrive in the term and preterm infants of mothers depressed in the postnatal period: a population-based birth cohort study. *Child Psychology and Psychiatry*, 45 (2): 359-366.

Drotar, D. (1991). The family context of nonorganic failure to thrive. *American Journal of Orthopsychiatry*, 61: 23-34.

Evans, S., Reinhart, J.B., & Succop, R.A. (1972). Failure to thrive: a study of 45 children and their families. *Journal of the American Academy of Child Psychiatry*, 11: 440-457.

Field, T., Healy, B, & LeBlanc, W. (1990). Behaviour state matching and synchrony in mother-infant interactions of non-depressed versus depressed dyads. *Developmental Psychology*, 26: 7-14.

Fischhoff, J., Whitten, C.F., & Pettit, M. (1971). A psychiatric study of mothers of infants with growth failure secondary to maternal deprivation. *Journal of Pediatrics*, 79: 209-215.

Frankel, K.A., & Harman, R.J. (1996). Depressed mothers: They don't always look as bad as they feel. *Journal of American Academy of Child and Adolescent Psychiatry*, 35: 289-298.

Galler, J., & Harrison, R. (2000). Maternal depressive symptoms affect infant cognitive development in Barbados. *Journal of Child Psychology and Psychiatry*, 41: 747-757.

Goodman, S.H., Sewell, D.R., Cooley, E.L., & Leavitt, N. (1993). Assessing levels of adaptive functioning: the Role Functioning Scale. *Community Mental Health Journal*, 29: 119-131.

Gorman, J., Leifer, M., & Grossman, G. (1993). Nonorganic failure to thrive: maternal history and current maternal functioning. *Journal of Clinical Child Psychology*, 22 (3): 327-336.

Hammen, C., Gordon, D., Burge, D., Adrian, C., & Hiroto, D. (1987). Maternal affective disorders, illness, and stress: risk for children's psychopathology. *American Journal of Orthopsychiatry*, 144: 736-741.

Hay, D.F., Powlby, S., Sharp, D., Asten, P., Mills, A., & Kumar, R. (2001). Intellectual problems shown by 11-year-old children whose mothers had postnatal depression. *Journal of Child Psychology and Psychiatry*, 42 (7): 871-889.

Himes, J.H., Roche, A.F., Thissen, D., & Moore, W.M. (1985). Parent-specific adjustments for evaluation of recumbent length and stature of children. *Paediatrics*, 75: 304-313.

Jacobs, R.A., & Kent, J.T. (1977). Psychosocial profile of families of failure to thrive infants: a preliminary report. *Child Abuse and Neglect*, 1: 469-477.

Kerr, M.A., Bogues, L., & Kerr, D.S. (1978). Psychological functioning of mothers of malnourished children. *Pediatrics*, 57: 345-350.

Kochanska, G., Radke-Yarrow, M., Kuczynski, L., & Friedman, S. (1987). Normal and affectively ill mothers' beliefs about their children. *American Journal of Orthopsychiatry*, 57: 345-350.

Lewis, G., Pelosi, A.J., Araya, R., & Dunn, G. (1992). Measuring psychiatric disorder in the community: a standardized assessment for use by lay interviewers. *Psychological Medicine*, 22: 465-486.

Livingood, A.B., Daen, P. & Smith, B.D. (1983). The depressed mother as a source of stimulation for her infant. *Journal of Clinical Psychology*, 39: 369-375.

Lyons-Ruth, D. (1986). Face to face interactions of depressed mothers and their infants. In E.Z. Tronick and T. Field (Eds.) *Maternal Depression and Infant Disturbance. New Directions for Child Development*. San Francisco, Jossey Bass.

Martin, P., & Bateson, P. (1993). *Measuring Behaviour – An Introductory Guide*. 2nd Edition, Cambridge University Press.

McMahon, C., Barnett, B., Kowalenko, N., Tennant, C., Don, N. (2001). Postnatal depression, anxiety, and unsettled infant behaviour. *Australian and New Zealand Journal of Psychiatry*, 35: 581-588.

Metha, M.N. (1999). Protein energy malnutrition. In Parthasarathy, A. (Ed) *Indian Academy of Paediatrics Textbook of Paediatrics*. New Dehli: Jaypee Medical Publishers, 120-133.

Milgrom, J., Martin, P.R., & Negri, L. (1999). *Treating Postnatal Depression: A Psychological Approach for Healthcare Practitioners*. Chichester, England: Wiley.

Milgrom, J., Westley, D.T., & Gemmill, A.W. (2004). The mediating role of maternal responsiveness in some longer term effects of postnatal depression on infant development. *Infant Behaviour and Development*, 4: 443-454.

Montgomery, S.M., Bartley, M.J., & Wilkinson, R.G., (1997). Family conflict and slow growth. *Archives of Diseases in Childhood*, 77: 326-330.

Mumford, D.B., Saeed, K., Ahmad, I., Latif, S., & Mubbashar, M.H. (1997). Stress and psychiatric disorder in rural Punjab: a community survey. *British Journal of Psychiatry*, 170: 473-478.

Murray, L. (1992). The impact of postnatal depression on infant development. *Journal of Child Psychology and Psychiatry*, 33: 543-561.

Murray, L. & Cooper, P.J. (1996). The impact of postpartum depression on child development. *International Review of Psychiatry*, 8 (1): 55-63.

Murray, L. & Cooper, P.J. (1997). Effects of postnatal depression on infant development. *Archives of Childhood Disease*, 77 (2): 99-101.

Murray, L., Sinclair, D., Cooper, B., Ducournou, P., Turner, P., Stein, A. (1999). The socioemotional development of 5-year-old children of postnatally depressed mothers. *Journal of Child Psychology and Psychiatry*, 40 (8): 1259-1271.

O'Brien, L.M., Heycock, E.G., Hanna, M., Watts Jones, P., & Cox, J.L. (2004). Postnatal depression and faltering growth: a community study. *Pediatrics*, 113 (5): 1242-1247.

O'Hara, M., & Zekoski, E. (1988). Postpartum depression: a comprehensive review. In I. Brockington & R Kumar (Eds.), *Motherhood and Mental Illness*. UK: Butterworth, 17-693.

Patel, V., DeSouza, N., & Rodrigues, M., (2003). Postnatal depression and infant growth and development in low income countries: a cohort study from Goa, India. *Archives of Disease in Childhood*, 88 (1): 34-37.

Radloff, L. (1977). The CES-D scale: a self-report depression scale for research in the general population. *Jl Appl Psychol Meas*, 1: 385-401.

Rahman, A., Harrington, R., & Bunn, J. (2002). Can maternal depression increase infant risk of illness and growth impairment in developing countries? *Child: Care, Health, and Development*, 28: 51-56.

Rahman, A., Iqbal, Z., Bunn, J., Lovel, H., & Harrington, R. (2004). Impact of maternal depression on infant nutritional status and illness. *Archives of General Psychiatry*, 61: 946-952.

Ramsay, M., Gisel, E.G., McCusker, J., Bellavance, F., & Platt, R. (2002). Infant sucking ability, non-organic failure to thrive, maternal characteristics, and feeding practices: a prospective cohort study. *Developmental Medicine & Child Neurology*, 44: 405-414.

Righetti-Veltema, M., Conne-Perreard, E., Bousquet, A., & Manzano, J. (2002). Postpartum depression and mother-infant relationship at 3 months old. *Journal of Affective Disorders*, 70: 291-306.

Rutter, M. (1989). Psychiatric disorder in parents as a risk factor for children. In D. Schaffer, I. Phillips, & N.B. Enger (Eds.) *Prevention of Mental Disorder, Alcohol and Other Drug Use in Children and Adolescents*. Rockville, Maryland: Office for Substance Abuse, USDHHS.

Salt, P., Galler, J., & Ramsay, F. (1988). The influence of early malnutrition on subsequent behavioural development. VII. The effects of maternal depressive symptoms. *Journal of Behavioural and Behavioural Pediatrics*, 9: 1-6.

SIGN (2004). Scottish Intercollegiate Guidelines Network (SIGN) 50: A Developer's Handbook, Section 5: Systematic Literature Review. Revised May 2004.
[http://www.sign.ac.uk/guidelines/fulltext/50/section 5.html](http://www.sign.ac.uk/guidelines/fulltext/50/section%205.html)

Spitzer, R.L., Williams, J.B., & Gibbon, M. (1992). The Structured Clinical Interview for DSM-III-R. *Archives of General Psychiatry*, 49: 624-629.

Tanner, J.M., Whitehouse, R.H., Gairdner, D., & Pearson, J. (1987) *Growth and Development Record*. Castlemead Publications, Hertford, UK.

Thongkrajai, E., Thongkrajai, P., Stoeckel, J., Na-nakhon, S., Karenjanabutr, B., Sirivatanamethanont, J. (1990). Socioeconomic and health programme effects upon the behavioural management of diarrheal disease in northeast Thailand. *Asia Pacific Journal of Public Health*, 4: 45-52.

Tomlinson, M., Cooper, P.J., Stein, A., Swartz, L. & Molteno, C. (2006). Post-partum depression and infant growth in a South African peri-urban settlement. *Child: Care, Health and Development*, 32 (1): 81-86.

Whitten, V.E., & Gotlib, I.H. (1989). Infants of postpartum depression mothers: temperament and cognitive status. *Journal of Abnormal Psychology*, 98: 274-279.

World Health Organisation. *SCAN: Schedule for clinical assessment in neuropsychiatry*. Geneva, Switzerland: World Health Organization; 1994.

Wright, C.M., Matthews, J.N.S., Waterston, A., & Aynsley-Green, A. (1994). What is normal rate of weight gain in infancy? *Acta Paediatrica*, 83: 351-356.

Wright, C.M., Parkinson, K.N., & Drewett, R.F. (2006). The influence of maternal socioeconomic factors on infant weight gain and weight faltering (failure to thrive): data from a prospective birth cohort. *Archives of Disease in Childhood*, 91: 312-317.

Figure 1: Identification of relevant literature on infant weight faltering and maternal depression

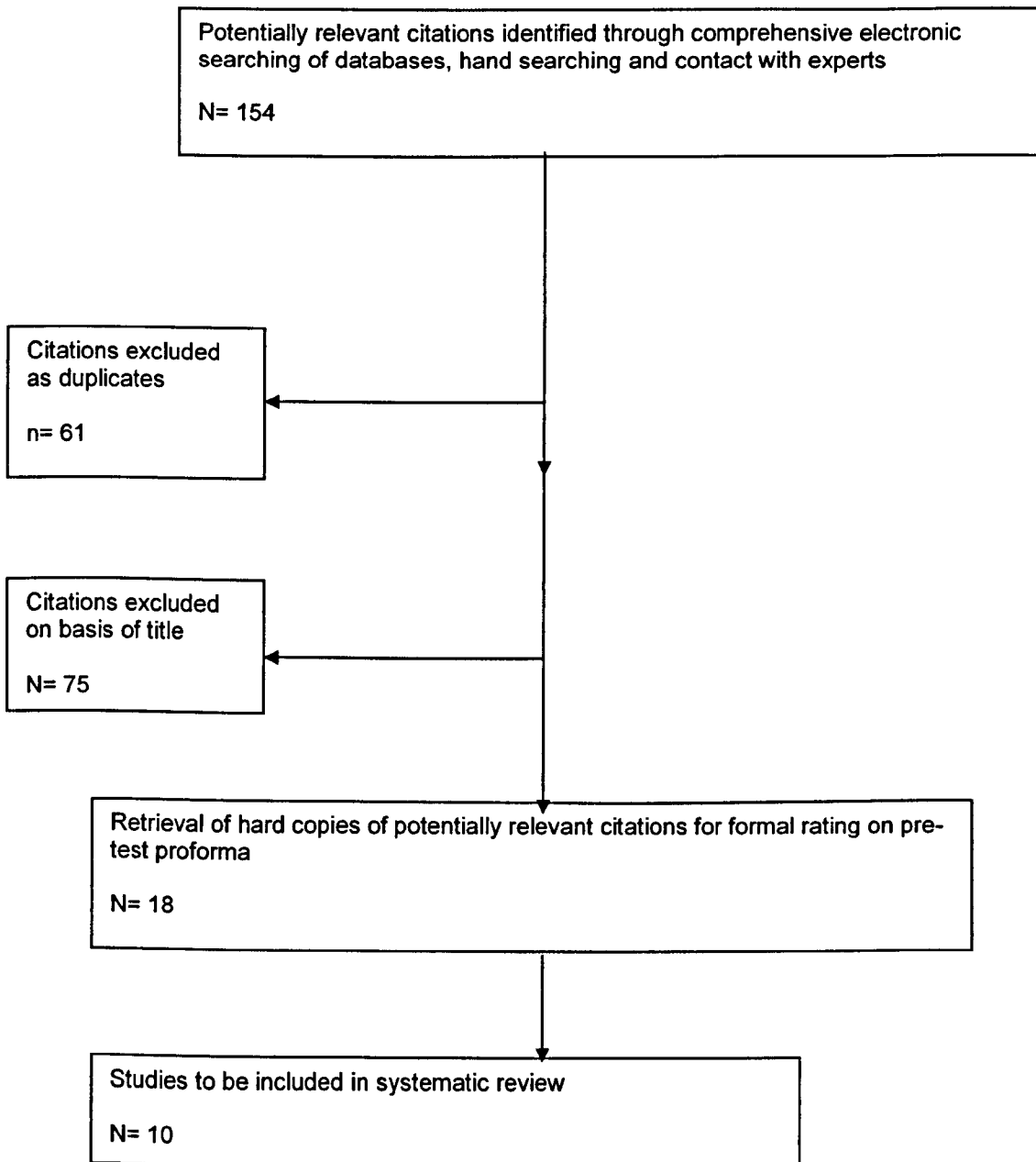


Table 1 Summary characteristics and quality ratings for studies included in the review

No	Study Title and evaluation level	Author and year	Study Design	Sample	Measures of maternal depression	Measures of infant weight faltering	Statistical Analysis	Findings
1	Postnatal depression and infant growth and development in low income countries: a cohort study from Goa, India. A	Patel, DeSouza, & Rodrigues, 2003	Cohort	171 infants, 51% males, average age 7.4 weeks, 18% weight faltering	EPDS	Weight-for-age z-scores	Univariate analysis, multiple logistic regression, 95% confidence intervals, odds ratios and p-values presented.	Postnatal depression was a strong and independent predictor of low weight and length and was significantly associated with adverse mental development quotient scores.
2	Impact of maternal depression on infant nutritional status and illness A	Rahman, Iqbal, Bunn, Lovel & Harrington, 2004	Cohort	161 infants of depressed mothers & 161 infants of non-depressed mothers	SCAN	Weight-for-age z-scores	Univariate analysis, multiple logistic regression, 95% confidence intervals, odds ratios, and p-values presented.	Infants of prenatally depressed mothers showed significantly more growth retardation at all time points. Chronic depression carried a greater risk than episodic depression. Associations remained significant after adjustment for confounds.
3	Infant sucking ability, non-organic failure to thrive, maternal characteristics, and feeding practices: a prospective cohort study. A	Ramsay, Gisel, McCusker, Bellavance, & Platt 2002	Cohort	202 infants with inefficient sucking and 207 with efficient sucking	EPDS	Weight-for-age z-scores	Univariate analysis, multiple logistic regression, 95% confidence intervals, odds ratios, and p-values presented.	Maternal depression did not affect infant growth, feeding ability or feeding practices.
4	Failure to thrive in the term and preterm infants of mothers depressed in the postnatal period: a population-based birth cohort study B	Drewett, Blair, Emmett, Edmond & the ALSPAC Study Team, 2004	Cohort	12391 infants, 587 identified as failing to thrive	EPDS	Thrive Index	Univariate analysis, multiple logistic regression, 95% confidence intervals reported.	High depression scores in postpartum period not associated with higher prevalence of FTT in term or preterm infants.

No	Study Title and evaluation level	Author and year	Study Design	Sample	Measures of maternal depression	Measures of infant weight faltering	Statistical Analysis	Findings
5	The influence of maternal socioeconomic and emotional factors on infant weight gain and weight faltering (failure to thrive): data from a prospective birth cohort. B	Wright, Parkinson, & Drewett, 2006	Cohort	923 infants, 10% weight faltering at some point, 4% sustained weight faltering.	EPDS	Thrive Index	Univariate analysis, multiple logistic regression, p-values presented.	Infants of mothers with high depression scores had significantly slower weight gain and increased rates of weight faltering up to 4 months of age especially if they came from a deprived family. By 12 months they were no different to rest of cohort.
6	Post-partum depression and infant growth in a South African peri-urban settlement. C	Tomlinson, Cooper, Stein, Swartz, & Molteno 2006.	Cohort	147 mother-infant dyads; 34.7% depressed at 2 months postpartum and 12% at 18 months.	SCID	Weight-for-age z-scores	Univariate analysis, linear regression, 95% confidence intervals, odds ratios, and p-values presented.	No clear affect of postpartum depression on infant growth.
7	Maternal depression and low maternal intelligence as risk factors for malnutrition in children: a community based case-control study from South India A	Anoop, Saravanan, Joseph, Cherian, & Jacob, 2004	Case-Control	72 infants with weight faltering and 72 matched controls	SCID	Weight-for-age z-scores	Univariate analysis, conditional logistic regression, 95% confidence intervals, odds ratios, and p-values presented.	Major depression ion the postpartum period, current major depression, and low maternal intelligence were associated with weight faltering.

No	Study Title and evaluation level	Author and year	Study Design	Sample	Measures of maternal depression	Measures of infant weight faltering	Statistical Analysis	Findings
8	Mothers of undernourished Jamaican children have poorer psychosocial functioning and this is associated with stimulation provided in the home B	Baker-Henningam, Powell, Walker, Grantham-McGregor, 2003	Case-Control	139 weight faltering infants and 71 matched controls.	Centre for epidemiological studies depression scale	Weight-for-age z-scores	Univariate analysis, multiple logistic regression, 95% confidence intervals, odds ratios, r-squared change values and p-values reported.	Mothers of undernourished children were more depressed, had lower levels of parenting self esteem, reported higher levels of economic stress, and provided a less stimulating home environment.
9	Non-organic failure to thrive: maternal history and current maternal functioning B	Gorman, Leifer, & Grossman, 1993	Case-Control	20 NOFT infants and 23 matched controls	BDI	Weight-for-age z-scores	Two-tailed t-tests with p-values reported	The mothers of NOFT infants reported feeling more depressed, reported more negative life stress, had less optimal social networks, and had a more negative perception of their babies.
10	Postnatal depression and faltering growth: a community study B	O'Brien, Heycock, Hanna, Jones, & Cox 2004	Case-Control	196 weight faltering infants and 567 matched controls	EPDS	Weight-for-age z-scores	Univariate analysis, logistic regression, with p-values, odds ratios and 95% confidence intervals reported.	Depression in mothers of infants who are weight faltering is significantly greater than in mothers of children who are gaining weight appropriately.

Studies in red are studies completed within the developing world

Chapter 3: Major Research Project Proposal

Adapting the Mellow Parenting Scale to assess videoed meals in children aged 1-2 years: is it practical, valid and reliable, and does it discriminate between children with and without weight faltering – a research proposal.

Joanne Robertson

Submitted in partial fulfilment of the requirements for the degree of Doctor of Clinical Psychology.

***Address for Correspondence:
Joanne Robertson
Section of Psychological Medicine
Division of Community Based Sciences
University of Glasgow
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow G12 0XH
Tel: 0141 211 3920
Fax: 0141 357 4899
E-mail: 9608041r@student.gla.ac.uk**

Summary

Despite the common occurrence of feeding difficulties in childhood, few reliable and valid assessment measures and feeding scales are available to the clinician working in the field. The majority of measures which exist, focus either on the behaviour of the child and/ or the influence of parental behaviour on the child's actions. Few scales take into account the influence of parent-child interaction in the feeding process. The current study proposes to be an exploratory study of the psychometric properties of one such parent-child scale (Mellow Parenting) and evaluate its practicality as a measure of assessment in children with mild-moderate weight faltering. A quasi-experimental design will be adopted with both a pilot and definitive study examining the schemes applicability to videoed meals of children aged 1-2 years and to determine its reliability and validity. Data will be analysed using relevant descriptive and inferential statistics and ethical approval will be sought.

Introduction

Feeding difficulties are a common behavioural disturbance in children. It is reported by parents that 24% of 2 year olds, 19% of 3 year olds and 18% of 4 year olds have problems with their feeding (Beautrais, 1982.) As such, feeding difficulties represent a wide range of problems from transient, minor problems at dinnertime for example messiness, noisiness, and disruptive behaviour, to total food refusal and potentially life threatening malnutrition (Luiselli, 1989.) Failure to thrive is one such feeding disturbance identified by relatively slow weight gain in infancy over a reasonably extended time period. Clinical cases usually present around 1 year old during the weaning period when children are either below the third percentile for weight or have shown progressive weight loss and fallen down the percentile chart by at least two

bands (Batchelor, 1999.) Prevalence rates have been estimated at between 3-4 % in the community and research, which has focussed purely on failure to thrive, has had a continuing difficulty in establishing the precise aetiology of the problem (Douglas, 2002.) Indeed theories of the aetiology of feeding disturbances in children increasingly reflect the complex interaction between behavioural, organic, developmental, and psychosocial factors (Chatoor, 1997.) Given the complex nature of these difficulties it is surprising that there are few appropriate ways of assessing such problems in children with only a limited range of feeding scales being available. A number of methods to assess feeding behaviour in children have been developed which focus on the actual behaviour of the child, or on parental behaviour, and the influence this has on the child's eating habits. Kasese-Hare (1997) developed a coding scheme in a population of children referred with FTT to describe child's feeding behaviour in terms of four acts: accept, refuse, give and self-feed with high reliability (>0.87). This scheme was later used by Parkinson and Drewett (2001) in a home based study of 100 children aged 12-14 months to examine the relationship between feeding behaviour, meal duration, and food intake (Parkinson and Drewett, 2001.) The codes distinguished between when the mother was feeding the child directly and assisting the child's self-feeding, and between the child's behaviour when responding to being fed and when feeding themselves. Furthermore this study found that when fed by the mother, the food intake was greater than when the children self fed. This would seem to suggest that the process of responsive feeding, i.e. when both mother and child involved in a feeding dyad, that the child's behaviour is affected and that the child consumes greater amounts of food.

The same coding scheme has also been used in population-based study to examine energy intake in children with growth faltering (Parkinson, Wright, and Drewett, 2004.) Nested within the Millennium Baby Study, this study involved the direct observation of 30 cases and 57 controls over two lunchtime meals (one spoon fed and one finger fed) to examine the relationship between feeding behaviour and energy intake, weight of food eaten, and meal duration. Systematic differences in feeding behaviour between meal types were observed with the mother feeding the child more often at spoon fed meals and the child feeding itself more at finger meals. In terms of weight, more food was consumed at spoon meals but energy intake was no higher indicating that the child compensates for differing energy yields of the food types. Only macro differences were observed in that growth-faltering children took in less energy than controls and were less likely to sit in a highchair throughout meal but no clear differences in other aspects of feeding behaviour. The coding scheme of Kasese-Hare (1997) is a reliable and valid measure of infant feeding behaviour but given the above findings, it does not allow for an assessment of mother-child interaction, a process central to the feeding relationship.

Several coding schemes do exist which purport to measure parent-child interaction at mealtimes with varying degrees of success. Koivisto, Fellenius, and Sjoden (1994), for example, examined food intake of children aged 3-7 years and related this to selected parental and child mealtime behaviours from video recordings of meals in 50 Swedish families. This study used the Bob and Tom Method of Assessment (BATMAN), an unpublished measure adapted from the work of Klesges, Coates, Brown, Sturgeon-Tillison, Moldenhauer-Klesges, Holzer, Woolfrey, and Vollmar (1983.) Reported findings highlighted that the majority of parental behaviours at

mealtimes were verbal, with negative statements about the child being very common and negatively correlated with energy intake. The child's energy intake was also positively correlated with the child taking food on the recommendation of the parent. These results supported earlier findings, which suggested the social and emotional context of a mealtime is a powerful determinant of a child's food preferences and food intake (Birch, Marlin, and Rotter, 1984; Casey and Rozin, 1989.) However, the BATMAN is a culturally specific coding scheme and although it has good inter-observer reliability, the study it was validated on had a small sample size and the socio-economic and ethnic status/ background were restricted, limiting the generalisability and applicability of the measure. In addition, although the measure purports to measure parent-child interaction, there is no assessment of the emotional tone or content of the meal situation, essential factors in the feeding relationship. Overall, although the BATMAN is an easy to use coding scheme, its use is limited due to cultural specificity and its failure to take into account intrinsic aspects of the feeding process. Nonetheless results using the measure indicate that parents influence children's eating, which may have implications for the development of food preferences and feeding difficulties in childhood.

The Mealtime Observational Schedule (Sanders and LeGrice, 1993) is another coding scheme used to study children with persistent feeding difficulties. This unpublished measure has been used to examine the relationship between parental feeding practices and feeding behaviour of toddlers and preschool age children with matched controls. Observations using this scheme are recorded when there is an occurrence of the behaviour in consecutive 10-second time block during a 20 minute videotaped observation period. As with the BATMAN, failure to use real time coding limits the

MOS as an observational tool as not all acts within the recording period are coded. The scheme has good inter-rater reliability with a mean of .83 (parent behaviours: range .71 to .99) and .80 for children's behaviour (range .50 to .99) but further psychometric properties of the scale have not been studied. Observational results in this study showed that index group children engaged in higher levels of disruptive mealtime behaviour, for example food refusal, non-compliance and oppositional behaviour. Furthermore it was observed that parents of index children engaged in more coercive strategies in their feeding practices and engaged in higher levels of aversive instruction giving, aversive prompting, and negative eating related comments. This would again seem to indicate that the socio-affective context and emotional tone of a mealtime situation plus the interaction between parent and child influences children's behaviour and overall food intake.

Stein, Woolley, Cooper and Fairburn (1994) in an observational study of the interaction between 2 groups of primiparous mothers, one of whom had a history of eating disorder and their children, found that index group mothers were more intrusive with their children at both meal and play times and that they expressed more negative emotion toward their child during mealtimes but not play. There were no group differences in terms of positive expressed emotion however index infants emotional tone was judged to be generally more negative and mealtimes more conflictual compared to controls. Furthermore index infants tended to be lighter and the extent of conflict during mealtimes was found to be inversely related to infant weight. Therefore it appears that when conflict predominated during mealtimes, the infants consume less food, which may lead to growth faltering and the infant consuming insufficiently.

Vygotskian theory postulates that parents facilitate a child's development by (1) providing social support and interest in the social environment, (2) translating the requirements of daily tasks so that they are understandable for the young child and, (3) helping the child move from dependence on others to autonomous functioning in completing daily tasks. This process is completed within the "zone of proximal development" (Vygotsky, 1979), or the distance between the child's independent functioning and the skills and capacities the child displays and social support. This concept is similar to and consistent with the concepts of "scaffolding" and "joint attention" proposed by Bruner (1985), as well as the quality of assistance described by Stroufe (1979.) Scaffolding is the process by which an adult provides the support necessary for a child to complete a task successfully, but also extends to the child's current skills and knowledge to a higher level. Scaffolding can be provided at an emotional level as well, and the parents capacity to recognize their child's emotional as well as cognitive, communicative, or problem solving needs may be as important in supporting a child's developing capacities and sense of competence. This affective scaffolding has been described in the developmental psychoanalytic literature as the parent functioning in the role of the child's auxiliary ego. Winnicott (1965) suggested that the parents predictability and capacity to provide a "holding environment" for the child should allow the child to be free to explore and see what he or she can make happen, rather than anxiously reacting to possible impingements from the environment. The concepts of "sensitivity" and "responsivity" (Ainsworth et al, 1978), "emotional availability" (Emde, 1980), "mirroring" (Stern, 1985), "structuring and mediating the environment" and "connectedness" all describe aspects of optimal parental care that supports a child's growing capacity and sense of self. Therefore as theory and research have indicated, the process of parenting children includes

emotional and cognitive scaffolding, and a diverse and shifting mixture of care, affection, control and stimulation, which is all, supported by a complex array of feelings and interactions which reflect partly the parents internal world and partly the child's temperament and reactions. Observational research focusing on parent-child interaction, while time-consuming and demanding, have been shown to distinguish problem dyads (Dowdney, Skuse, Rutter, Quinton, and Mrazek 1985; Mills, Puckering, Pound and Cox 1985; Puckering, Pickles, Skuse, Heptinstall, Dowdney, and Zur Spiro, 1994.)

Mellow Parenting, a group intervention for families of young children where there are parenting problems, uses an observational coding scheme to examine parent-child interaction and has been used in previous studies to examine videoed mealtime situation in normal children (Puckering, Rogers, Mills, Cox, and Mattsson-Graff 1994b and Puckering, Evans, Maddox, Mills, and Cox, 1996.) The Mellow Parenting group approach consists of three main elements: (i) a psychotherapeutic group to encourage mothers to draw links between past and current relationships and feelings; (ii) parenting psychoeducation and (iii) homework to allow mother to try out parenting techniques learned within the group. An aspect of the parenting psychoeducation is using videoed parent-child interactions as a learning tool and allowing parents to observe where difficulties in the interaction are arising. The coding scheme used in assessing videoed interactions is based on a reduced version of the NEWPIN Coding Scheme (Cox, Puckering, Pound, Mills and Owen, 1990) with the observational measures being derived from the literature and previous research in the parenting field. The codes were validated experimentally, showing coherent

interrelationships and a correspondence with child behaviour problems. The main dimensions and codes of this scheme are contained in the table below.

Code	Dimension	Example of Interaction
Facilitate before caretake	Anticipation	The mother takes some action, which might be a distraction or warning or provision of information, before providing care to the child.
Mother's positive affect	Warmth and stimulation	All instances of positive tone, physical affection or praise
Mother's negative affect	Emotional containment	All instances of negative tone, smacking or rough treatment, or criticism
Mother link-child follow	Warmth and stimulation	Mother makes a cognitive extension to the child's current focus of interest to which the child responds. For example, the child is looking at the peas on his plate and mother counts them for him. He repeats the numbers
Autonomy	Autonomy	The mother asks the child about his/ her preferences or monitors the child's activity closely, showing an awareness of the child's individuality, wishes and timing.

In addition, three overall (five point) ratings of warmth, sensitivity and effective control are used as a broader description of the interaction. All 5 codes met inter-rater reliability criteria greater than 85%. This coding scheme comprehensively takes into account aspects of the dyadic relationship between parent and child and has codes and measures of emotional tone and content of the relationship. The availability of the videoed meals from the Millennium Baby Study provides an opportunity to explore the use of the Mellow Parenting coding scheme in children with weight faltering and to examine the psychometric properties of the scale within this population.

Aims and Hypotheses

(A) Aims

- To develop a version of the mellow parenting coding scheme to be used on video meals for children aged 1-2 years.
- To use the coding scheme in a population of weight faltering children and matched controls to examine its inter-observer reliability, discriminant and predictive validity.

(B) Primary Hypotheses

- The quality of the parent-child feeding relationship among children with weight faltering will be significantly different from the control population.
- Parents of children with weight faltering will engage in lower levels of positive interaction with their children compared to controls.
- The quality of the parent-child relationship will be significantly associated with child's food intake.

Plan of Investigation

Participants and Recruitment

Participants in this study will include (i) a sample of clinical cases of children aged 1-2 years with feeding difficulties (n=11), 4 children aged 1-19 months and 7 children aged 20-22 months in a pilot study, and (ii) 30 identified cases of children with mild-moderate weight faltering plus 57 matched controls in the definitive research study.

The 11 clinical cases have already been recruited and filmed as clinical training videos.

The 30 cases and 57 controls required were recruited and filmed as part of the Millennium Baby Study conducted in Gateshead. These videos contain two mealtimes situations for each child (one spoon fed, one finger fed) and have since been used in studies of energy intake (Parkinson et al, 2004.) As these videos have not been filmed specifically to assess parent-child interaction, they will be unbiased and will be more likely to represent naturalistic interactions. Written consent has already been obtained from these children's parents allowing the use of these videos for research purposes.

Measures

The measure used will be a version of the Mellow Parenting Coding Scheme (Puckering et al, 1994b) simplified for use with videoed meals. This can be related to data already held on the subjects, including food intake, meal duration, height and weight at 13m and at school entry, as well as socio-demographic data on the mother and her scores on the Edinburgh Postnatal Depression Scale and the Dutch Eating Behaviour Questionnaire.

Design and Procedures

A quasi-experimental design will be used which will have three distinct stages:

Stage 1 – Training

Stage 1 will comprise training in the Mellow Parenting Coding Scheme with Christine Puckering. The primary researcher will be trained in the method alongside two other D. Clin. Psych trainees who will also be using the method as part of their major research projects. This will allow for inter-rater reliability to be measured. At this

stage there will be the opportunity for the primary researcher to be involved in the filming of mealtime situations to increase awareness of process and technical issues.

Stage 2 – Exploratory Study

This will be an exploratory pilot study using the Mellow Parenting Scheme to rate 11 clinical case videos and a sample of the MBS control videos already filmed. This pilot study will allow the researcher to establish the practicality of applying the different codes and their frequency prior to the definitive research study. At this stage, low frequency codes will either be deleted or collapsed into broader response categories and elements that cannot be consistently coded in this video format will be omitted.

Stage 3 – Definitive Research Study

All the Millennium Baby Study case and the remaining control videos will then be coded using the simplified coding scheme. Standardised coding sheets will be used to record instances of behaviours being measured. The average length of a mealtime is 20 minutes (40 minutes in total per child across the two meals filmed.) A randomly selected sample of the videos will be independently coded by a second observer to allow for assessment of inter-rater reliability. Both coders will be blind to caseness throughout data collection and coding. Both coders will be practised in using the coding scheme in the pilot study prior to the definitive study.

Settings and Equipment

Equipment required will be a standard video recorder, which will be supplied by the PEACH unit at the Queen Mother's Hospital, Glasgow. When coding videos, the

primary researcher will be based within the PEACH unit working alongside others practised in coding and feeding difficulties in children.

Power Calculation

Given the exploratory nature of this study it is difficult to accurately establish effect size and power required for the study. The power calculation has been based on the data obtained by Puckering et al (1994b). This study used the mellow parenting coding scheme in an evaluative study of the mellow parenting group intervention in 14 subjects. Using pre and post group means on the mother link-child follow dimension of the coding scheme (pre group mean = 3.1, SD 3.2; post group mean 6.8, SD 6.3) and the UCLA power calculator with power set at 0.8, the proposed study would require a sample size of 18 cases and 35 controls in the definitive research study. As there is availability to have 30 cases and 30 controls in the definitive research study, this would give sufficient power to detect differences of the order of 0.73 SD between the groups. No previous studies in this field have reported effect sizes but it is estimated that the proposed study would demonstrate a medium effect size.

Data Analysis

Both descriptive and inferential statistic will be used in analysing the data gathered. Event data tend to be skewed so medians and quartiles will be used for descriptive purposes. To analyse differences between the groups, the Mann Whitney U-Test, t-tests, or chi-squares will be used appropriate to the data gathered. Inter-rater reliability will be measured using the concordance measure, Cohen's Kappa, which corrects for chance agreement. Associations within the groups will be examined

using Spearman's (p) for non-parametric correlations. Repeatability will be assessed using the Bland Altman method

Practical Applications

The proposed study will be an objective clinical assessment of parent-child interaction in the field of infant feeding difficulties. It will establish the psychometric properties of the Mellow Parenting measure in this context and will highlight the constructs of this measure, which are most applicable to feeding difficulties. This study will lay the groundwork for future research and may provide basis for development of brief clinical tool to examine parent-child interaction in this area.

Timescale

May 05 - Submit final copy of project proposal to course team for peer review

June 05 – Submit COREC form to ethics committee

June/ July – Systematic literature review plus any changes required by ethics

August Onwards – Training, pilot and definitive study, data analysis and write up

Ethical Approval

A copy of the COREC form will be submitted to a local research and ethics committee for approval prior to the commencement of the study. Need to submit to GG Mental Health Division with Part C to Yorkhill.

References

- Ainsworth, M., Blehar, M., Waters, M., Wall, S. (1978) *Patterns of Attachment*. Hillsdale, Erlbaum.
- Batchelor, J.A. (1999). Failure to thrive in young children: Research and practice evaluated. London: The Children's Society.
- Beautrais, A.L., Fergusson, D.M., and Shannon, F.T., (1982). Family life events and behavioural problems in pre-school aged children. *Pediatrics*, 70, 774-779.
- Birch, L.L., Marlin, D., and Rotter, J. (1984) Eating as the "means" activity in a contingency effects on young children's food preferences. *Child Development*, 55, 431-439.
- Bruner, J. (1985) *Child's Talk: Learning to Use Language*, WW Norton, New York &. London.
- Casey, R., and Rozin, P. (1989) Changing food preferences: parent options. *Appetite*, 12, 171-182.
- Chatoor, I. (1997). Feeding disorders of infants and toddlers. In S Greenspan, S Wieder and J. Osofsky (Eds.), *Handbook of child and adolescent psychiatry, Vol.1. Infants and pre-schoolers: Development and syndromes* (pp. 367-386) New York: Wiley.

Cox, A.D., Puckering, C., Pound, A., Mills, M., and Owen, A.L., (1990) *The evaluation of a home visiting and befriending scheme*. NEWPIN Final Report to the Department of Health.

Douglas, J. (2002). Psychological treatment of food refusal in young children. *Child and Adolescent Mental Health*, Vol. 7, No. 4, pp. 173-180.

Dowdney, L., Skuse, D., Rutter, M., Quinton, D., and Mrazek, D. (1985) The nature and quality of parenting provided by women raised in institutions. *Journal of Child Psychology and Psychiatry*, 26, 599-626.

Drewett, R.F., Kasese-Hara, M., and Wright, C.M. (2002). Feeding behaviour in young children who fail to thrive. *Appetite*, 40, pp 55-60.

Kasese-Hara, M. (1997). *Feeding behaviour and appetite in young children with non-organic failure to thrive*. PhD thesis, Department of Psychology, University of Durham, England.

Klesges, R.C., Coates, T.J., Brown, G., Sturgeon-Tillisch, J., Moldenhauer-Klesges, L.M., Holzer, B., Woolfrey, J., and Vollmer, J., (1983) Parental influences on children's eating and behaviour and relative weight. *Journal of Applied Behaviour Science*, Vol 16, No. 1, pp. 371-378.

Kovisto, U.K., Fellenius, J, and Sjoden, P.O., (1994). Relations between parental mealtime practices and children's food intake. *Appetite*, Vol, 22, 245-258.

Luiselli, J.K. (1989). Behavioural assessment and treatment of pediatric feeding disorders in developmental disabilities. *Progress in Behaviour Modification*, 24, 91-131.

Mills, M., Puckering, C., Pound, A., and Cox, A.D. (1985) What is it about depressed mothers that influences their children's functioning? In J.E. Stevenson (Ed), *Recent Research in Developmental Psychopathology*. Book Supplement to the *Journal of Child Psychology and Psychiatry*, No. 4, 11-17.

Parkinson, K.N., Wright, C.M., and Drewett, R.F., (2004). Mealtime energy intake and feeding behaviour in children who fail to thrive: a population-based case-control study. *Journal of Child Psychology and Psychiatry*, Vol 45, No 5, pp 1030-1035.

Puckering, C., Pickles, A., Skuse, D., Heptinstall, E., Dowdney, L., and Zur Spiro, S. (1994). The role of mother child interaction in the cognitive and behavioural development of four-year-old children with non-organic failure to thrive. *Journal of Child Psychology and Psychiatry*,

Puckering, C., Rogers, J., Mills, M., Cox, A.D., Mattsson-Graff, M., (1994b) Process and evaluation of a group intervention for mothers with parenting difficulties. *Child Abuse Review*, 3, 299-310.

Puckering, C., Evans, J., Maddox, H., Mills, M., and Cox, A.D. (1996) Taking control: a single case study of mellow parenting. *Clinical Child Psychology and Psychiatry* 1 (4): 539-550.

Sanders, M.R., Patel, R.K., Le Grice, B., and Shepherd, R.W., (1993). Children with persistent feeding difficulties: an observational analysis of the feeding interactions of problem and non-problem eaters. *Health Psychology*, Vol. 12, No. 1., pp. 64-73.

Stein, A., Woolley, H., Cooper, S.D., and Fairburn, C.G., (1994). An observational study of mothers with eating disorders and their infants. *Journal of Child Psychology and Psychiatry*, Vol 35, No 4, pp 733-748.

Stern, D. (1985). *The Interpersonal World of the Child*. New York: Basic Books

Stroufe, L.A., (1979) The coherence of individual development: early care, attachment, and subsequent developmental issues. *American Psychologist*, 34, 834-841.

Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Winnicott, D.W. (1965) *The Maturation Processes and the Facilitating Environment*. New York: International Universities Press.

Amendments to Study

1. Subsequent to the proposal, the hypotheses were altered. The third hypothesis related to parent-child interaction in food intake was changed to examine levels of negative interaction among cases and controls. This hypothesis was altered as Parkinson et al (2004) did not report any significant differences between the groups in terms of weight of food eaten and energy intake. It was unlikely therefore that significant effects would be observed in this study in relation to food intake and parent-child interaction.
2. Inter-rater reliability was measured by Cohen's Kappa (Martin & Bateson, 1993) not the Bland-Altman Method.

Chapter 4: Major Research Project

Adapting the Mellow Parenting scale to assess videoed meals in children aged 1-2 years: is it practical, valid and reliable, and does it discriminate between children with and without weight faltering?

Joanne Robertson

Prepared in accordance with requirements for submission to Child Development

*Submitted in partial fulfillment of the requirements of the degree of Doctor of Clinical
Psychology.*

***Address for Correspondence:
Joanne Robertson
Section of Psychological Medicine
Division of Community Based Sciences
University of Glasgow
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow G12 0XH
Tel: 0141 211 3920
Fax: 0141 357 4899
E-mail: 9608041r@student.gla.ac.uk**

Abstract

Background: Feeding difficulties such as infant weight faltering are a common behavioural disturbance in children. There is research evidence to suggest that there is an association between parent-child interaction and infant weight faltering. However, there are few reliable and valid assessment measures and feeding scales available to the clinician working in the field. The majority of measures which exist, focus either on the behaviour of the child and/ or the influence of parental behaviour on the child's actions. Few scales take into account the influence of parent-child interaction in the feeding process. The current study is an exploratory study of the psychometric properties of one such parent-child scale (Mellow Parenting) and an evaluation of its practicality as a measure of assessment in children with mild-moderate weight faltering.

Methodology: A simplified version of the Mellow Parenting scale was devised during a pilot study and its psychometric properties examined in a definitive research study utilising a sample of 30 mother-infant dyads with weight faltering and 29 healthy controls. The study utilised a quasi-experimental design and was conducted blind to caseness. Inter-rater reliability was also completed blind to infant health status.

Results: The simplified version of the Mellow Parenting scale was demonstrated to have excellent inter-rater reliability (0.82) and coherent inter-relationships between coding domains. Discriminative validity was assessed using Mann-Whitney tests for non-parametric data and the coding scheme was demonstrated to discriminate between cases and controls.

Discussion: Theoretical and clinical implications of the current research project are discussed and the multifarious nature of infant weight faltering is considered.

Keywords: infant weight faltering, parent-child interaction, Mellow Parenting, videoed meals.

Introduction

Feeding difficulties are a common behavioural disturbance in children. It is reported by parents that 24% of 2 year olds, 19% of 3 year olds and 18% of 4 year olds have problems with their feeding (Beautrais, 1982.) As such, feeding difficulties represent a wide range of problems from transient, minor problems at dinnertime for example messiness, noisiness, and disruptive behaviour, to total food refusal and potentially life threatening malnutrition (Luiselli, 1989.) Weight faltering is one such feeding disturbance identified by relatively slow weight gain in infancy over a reasonably extended time period. Clinical cases usually present around 1 year old during the weaning period when children are either below the third percentile for weight or have shown progressive weight loss and fallen down the percentile chart by at least two bands (Batchelor, 1999.) Despite prevalence rates of between 3-4 % in the community there has been a continuing difficulty in establishing the precise aetiology of the problem (Douglas, 2002.) Theories of the aetiology of feeding disturbances in children increasingly reflect the complex interaction between behavioural, organic, developmental, and psychosocial factors (Chatoor, 1997.) One of the areas of interest in attempting to establish an aetiology has been the role of parenting behaviours associated with weight faltering in infancy.

Parenting Behaviour Associated with Infant Weight Faltering: the Theoretical

Background

The interaction between parent and child in infancy is of key importance to a child's social development. Vygotskian theory postulates that parents facilitate a child's

development by (1) providing social support and interest in the social environment, (2) translating the requirements of daily tasks so that they are understandable for the young child and, (3) helping the child move from dependence on others to autonomous functioning in completing daily tasks. This process is completed within the “zone of proximal development” (Vygotsky, 1979), or the distance between the child’s independent functioning and social support. This concept is similar to and consistent with the concepts of “scaffolding” and “joint attention” proposed by Bruner (1985), as well as the “quality of assistance” described by Stroufe (1979.) Scaffolding is the process by which an adult provides the support necessary for a child to complete a task successfully, but also extends to the child’s current skills and knowledge to a higher level. Scaffolding can be provided at an emotional level and has been described in the developmental psychoanalytic literature as the parent functioning in the role of the child’s auxiliary ego. The concepts of “sensitivity” and “responsivity” (Ainsworth et al, 1978), “emotional availability” (Emde, 1980), “mirroring” (Stern, 1985), “structuring and mediating the environment” and “connectedness” all describe aspects of optimal parental care that supports a child’s growing capacity and sense of self. The process of parenting children includes emotional and cognitive scaffolding within a relationship of diverse and shifting mixtures of care, affection, control and stimulation, which is all, supported by a complex array of feelings and interactions. The feeding interaction is central in establishing a parent’s relationship with their child with the term “feeding relationship” emphasizing the dyadic nature of the interaction (Chatoor, 2000.) It has been suggested that maladaptive feeding patterns, such as infant weight faltering, arise because dysfunctional relationship patterns lead to inconsistency in feeding and/ or conflict at

mealtimes (Drotar, 1991.) This would seem to indicate that observation of the interaction between parent and child would inform an understanding of the nature of the problem in the parent-child relationship.

Clinical Research Investigating Parent Child Interactions and Infant Weight Faltering

Early research studies reported positive relationships between maternal behaviours and infant weight faltering. For example, it was argued that “it is the mother who is key” in weight faltering, on the basis of a clinical evaluation of a single family (Shapiro et al, 1976, p461.) Unsurprisingly, these early studies tended to be methodologically flawed with a number of conclusions being drawn on the basis of anecdotal evidence.

Later researchers, utilizing improved methodology, have maintained that distortions within the mother-child interaction can be explained by an examination of the concept of attachment (Bowlby, 1969.) A controlled study of mother-infant attachment reported that 6 out of 12 weight faltering infants and 2 out of 12 controls were insecurely attached with attachment being assessed via Ainsworth’s Strange Situation Procedure (Gordon and Jameson, 1979; Ainsworth, Blehar, Waters, and Wall, 1978.) However, as the numbers in this study were too small to allow evaluation of statistical significance, and since half the infants who failed to thrive were securely attached, the results provide limited evidence that distorted mother-child attachment leads to weight faltering. Similarly, in a study examining infant-mother attachment in 83 children with weight faltering and 130 normally growing comparison children, results suggested that children with faltering weight were significantly less likely to show secure and more likely to show anxious,

disorganized attachments on Ainsworth's Strange Situation test than healthy controls (Ward et al, 2000.) However, as this was not a prospective study, the results cannot be used to address the aetiological role of anxious attachment in infant weight faltering.

Other observational research in the area has attempted to quantify mother-child interaction in weight faltering while also attempting to address the methodological issues present in earlier studies. In a controlled study of 38 families with a child who was not thriving, structured observations were carried out in the home, indicating that mothers whose children were failing to thrive demonstrated less physical and verbal interaction with their children than controls (Pollitt, Eichler, and Chan, 1975.) However, despite improved methodological rigour to previous studies, the reliability of observer ratings may be questioned as assessments were completed unblinded to the study hypotheses. Two further studies also carried out standardized home observations and reported several differences in maternal behaviour between cases and matched controls including lower rates of sensitivity, emotional expression, responsiveness, acceptance, and cooperation. (Casey et al, 1984; Drotar et al, 1990.) Positively, observations in both these studies were made blind to group status and experimental hypotheses, but the studies utilized a hospital referred sample introducing the possibility of sampling bias when interpreting the results.

Several other studies comparing children with weight faltering and controls have detected higher levels of maternal intrusiveness (Stein et al, 1994), more negative affect and struggle for control (Sanders et al, 1993; Wolke et al, 1990) and less optimal home

environment (Drotar, 1991) in the index groups. In a study examining mother-child interaction with a community referred sample, standardized home observations of mealtime situations were assessed blind to case/control status (Heptinstall et al, 1987.) In this study, differences were observed in parenting behaviour with case mothers being rated as more indifferent or anxious than mothers of thriving children, displaying more negative affect, and being less likely to give instructions, communicate or socialize at mealtimes. Mother-child touch patterns, a facet of mother-child interaction, was examined in 20 infants diagnosed with a feeding disorder such as food refusal or chronic malnutrition, and 27 children with other primary disorders, case-matched with non-referred controls. Using the HOME observational schedule (the Home Observation for Measurement of Environment; Caldwell and Brady, 1984), mother-child play and feeding were observed by assistants blind to group status. Results indicated that compared with infants with other primary disorders and healthy controls, less maternal affectionate, proprioceptive, and unintentional touch was observed in those with feeding disorders. In addition, children with feeding disorders displayed less affectionate touch, more negative touch, and more rejection of the mothers touch than healthy controls. Therefore, mother-child reciprocity, contingent interactions, and low struggle for control are some areas that have been highlighted as being central to the feeding relationship (Chatoor, 2000.) Overall, these studies would appear to indicate that there is some evidence of an association between parental behaviour and infant weight faltering. Despite this however, there is a surprising lack of appropriate assessment measures which have been validated and used in the assessment of parent-child interaction in infant weight faltering.

Assessment Scales and their Limitations

A number of methods to assess feeding behaviour in children have been developed which focus on the actual behaviour of the child, or on parental behaviour, and the influence this has on the child's eating habits. Kasese-Hare (1997) developed a coding scheme in a population of children referred with failure to thrive to describe child's feeding behaviour in terms of four acts: accept, refuse, give and self-feed with high reliability (>0.87). This scheme was later used by Parkinson and Drewett (2001) in a home based study of 100 children aged 12-14 months to examine the relationship between feeding behaviour, meal duration, and food intake (Parkinson and Drewett, 2001.) This study found that when fed by the mother, the food intake was greater than when the children self fed which would seem to suggest that the process of responsive feeding, i.e. when both mother and child were involved in a feeding dyad, that the child's behaviour is affected and the child consumes greater amounts of food.

The same coding scheme has also been used in population-based study to examine energy intake in children with growth faltering (Parkinson, Wright, and Drewett, 2004.) Nested within the Millennium Baby Study, this study involved the direct observation of 30 cases and 57 controls over two lunchtime meals (one spoon fed and one finger fed) to examine the relationship between feeding behaviour and energy intake, weight of food eaten, and meal duration. Systematic differences in feeding behaviour between meal types were observed with the mother feeding the child more often at spoon fed meals and the child feeding itself more at finger meals. Although the coding scheme of Kasese-Hare (1997)

is a reliable and valid measure of infant feeding behaviour it does not allow for an assessment of mother-child interaction, a process central to the feeding relationship.

Several coding schemes do exist which purport to measure parent-child interaction at mealtimes with varying degrees of success. Koivisto, Fellenius, and Sjoden (1994), for example, examined food intake of children aged 3-7 years and related this to selected parental and child mealtime behaviours from video recordings of meals in 50 Swedish families. This study used the Bob and Tom Method of Assessment (BATMAN), an unpublished measure adapted from the work of Klesges, Coates, Brown, Sturgeon-Tillison, Moldenhauer-Klesges, Holzer, Woolfrey, and Vollmar (1983.) Reported findings highlighted that the majority of parental behaviours at mealtimes were verbal, with negative statements about the child being common and correlated with energy intake. These results supported earlier findings, which suggested the social and emotional context of a mealtime is a powerful determinant of a child's food preferences and food intake (Birch, Marlin, and Rotter, 1984; Casey and Rozin, 1989.) However, the BATMAN is a culturally specific coding scheme and although it has good inter-observer reliability, the study had a small sample size and the socio-economic and ethnic status/background were restricted, limiting the generalisability and applicability of the measure. Overall, although the BATMAN is an easy to use coding scheme, its use is limited due to cultural specificity and its failure to take into account intrinsic aspects of the feeding process. Nonetheless results using the measure indicate that parent's influence children's eating, which may have implications for the development of food preferences and feeding difficulties in childhood.

The Mealtime Observational Schedule (Sanders and LeGrice, 1993) is another coding scheme that has been used to study children with persistent feeding difficulties. This unpublished measure has been used to examine the relationship between parental feeding practices and feeding behaviour of toddlers and preschool age children with matched controls. The scheme has good inter-rater reliability with a mean of .83 (parent behaviours: range .71 to .99) and .80 for children's behaviour (range .50 to .99) but further psychometric properties of the scale have not been studied. Observational results showed that index group parents engaged in more coercive strategies in their feeding practices and engaged in higher levels of aversive instruction giving, aversive prompting, and negative eating related comments. This would again seem to indicate that the socio-affective context and emotional tone of a mealtime situation plus the interaction between parent and child influences children's behaviour and overall food intake.

The Mellow Parenting Coding Scheme

Mellow Parenting, a group intervention for families of young children where there are parenting problems, uses an observational coding scheme to examine parent-child interaction and has been used in previous studies to examine videoed mealtime situation in normal children (Puckering, Rogers, Mills, Cox, and Mattsson-Graff 1994 and Puckering, Evans, Maddox, Mills, and Cox, 1996.) The Mellow Parenting group approach consists of three main elements: (i) a psychotherapeutic group to encourage mothers to draw links between past and current relationships and feelings; (ii) parenting psychoeducation and (iii) homework to allow mother to try out parenting techniques

learned within the group. An aspect of the parenting psychoeducation is using videoed parent-child interactions as a learning tool and allowing parents to observe where difficulties in the interaction are arising. Observational research focusing on parent-child interactions, while time consuming and demanding, have been shown to distinguish problem dyads (Dowdney, Skuse, Rutter, Quinton, and Mrazek 1985; Mills, Puckering, Pound and Cox 1985; Puckering, Pickles, Skuse, Heptinstall, Dowdney, and Zur Spiro, 1995.) Given the weaknesses inherent in previous published research and the lack of usable assessment measures, it would be interesting to examine whether it is possible to develop a version of the Mellow Parenting system as an assessment tool for infant weight faltering. The availability of the videoed meals from Parkinson et al (2004) provided an opportunity to explore the use of the Mellow Parenting coding scheme in children with weight faltering and to examine the psychometric properties of the scale within this population. The main aims of the current research are therefore to develop a version of the Mellow Parenting coding scheme to be used on video meals for children aged 1-2 years and to use the coding scheme in a population of weight faltering children and matched controls to examine its inter-observer reliability and discriminant validity. It is hypothesized that (a) The quality of the parent-child feeding relationship among children with weight faltering will be significantly different from the control population, (b) Parents of children with weight faltering will engage in lower levels of positive interaction with their children compared to controls, (c) Parents of children with weight faltering will engage in higher levels of negative interaction with their children compared with controls.

Methodology

Sampling Frame

The Millennium Baby Study recruited 1029 infants shortly after birth, comprising 82% of all infants born to Gateshead residents within 34 recruiting weeks between 1 June 1999 and 31 May 2000. A nested case-control study within the MBS utilized a sample of 30 cases identified as weight faltering and 57 matched controls (Parkinson et al, 2004). In this study, cases were identified as infant's with a thrive index <5th centile. A Thrive Index is change in weight (z scores), adjusted for the infants initial weight. The score that identifies the slowest growing 5% at different ages has been established (Wright et al, 1998a; Drewett et al, 1999) and is used to identify cases of infant weight faltering. Controls were identified from a 10% random sample of the remainder of the MBS cohort, provided their Thrive Index after 9 months was above the 10th centile. The current study utilized the videoed meals of Parkinson et al (2004.) Each video contained 2 mealtime situations for each infant (one spoon fed, one finger fed.) One control subject had only one recorded meal sequence.

Video Data

Participants were studied during two lunchtime meals at 13-21 months in their own homes, generally on consecutive days, with their mother present. One was a finger food meal and one a spoon meal with the order randomly counterbalanced. Commercially produced foods of known energy content were provided, selected by the mother from two lists. One comprised finger foods (e.g. fish fingers, chips and fruit) and the other spoon foods (e.g. mashed potatoes, spaghetti bolognese, and yoghurt) which the mother

prepared and gave as usual; she also provided any drinks. Video recording began when the food was placed in front of the child and continued until the food was removed, or the meal was clearly over. Meal sequences varied in duration from approximately 10 minutes to 1 hour. Consequently, coding of data varied in duration from 40 minutes to 1.5 hours.

Power Calculation

Given the exploratory nature of this study it is difficult to accurately establish effect size and power required for the study. The power calculation was based on the data obtained by Puckering et al (1994). This study used the Mellow Parenting coding scheme in an evaluative study of the Mellow Parenting group intervention in 14 subjects. Using pre and post group means on the mother link-child follow dimension of the coding scheme (pre group mean = 3.1, SD 3.2; post group mean 6.8, SD 6.3) and the UCLA power calculator with power set at 0.8, the proposed study would require a sample size of 18 cases and 35 controls in the definitive research study. As there is availability to have 30 cases and 29 controls in the definitive research study, this would give sufficient power to detect differences of the order of 0.73 SD between the groups. No previous studies in this field have reported effect sizes but it is estimated that the proposed study would demonstrate a medium effect size.

Ethical Approval

Ethical approval was granted by Gateshead and Tyneside Local Research Ethics Committee. A copy of the ethical approval is contained in Appendix 4.2.

Design and Procedures

A three stage quasi-experimental design was employed to address the main research questions. Initially, the main researcher (JR) was extensively trained in the use of the original Mellow Parenting Coding Scheme. This training involved JR coding videos of parent-child interactions in a variety of settings including play, mealtimes, and other care-giving situations. These codings were then assessed by a trained observer for inter-rater reliability until 85% reliability was achieved.

Prior to commencing an exploratory pilot study examining the utility of the mellow parenting coding scheme within the study sample, a 5% random sample was identified using a computer generated random numbers package which was to be used for establishing inter-rater reliability for the simplified coding scheme. The pilot study was then completed using the Mellow Parenting coding scheme to code a sample of the MBS control videos (n=14 finger and 14 spoon meals) This allowed the most relevant codes for feeding situations within a sample of healthy controls to be established. At this stage, low frequency codes were deleted to allow a simplified version of the Mellow Parenting coding scheme to be developed and evaluated within a definitive research study.

The simplified coding scheme was assessed via coding the 30 cases of weight faltering and the remaining 29 healthy control videos. Each 10 second interval of video footage was coded and standardized coding sheets and coding summary sheets were used to record all observed instances of parent-child interaction (see Appendix 3.3 and 3.4 for examples of coding sheets and summary sheets.) Throughout coding, the main researcher

was blind to caseness and the 5% random sample for inter-rater reliability purposes was also independently coded blind to group status. Using Cohen's Kappa statistic, inter-rater reliability for the simplified coding scheme was measured at 0.82 (excellent inter-rater reliability.)

Measures

The measure used in this study was a version of the Mellow Parenting Coding Scheme (Puckering et al, 1994) simplified for use with videoed meals developed during the exploratory pilot study described above. The Mellow Parenting coding scheme was based on a reduced version of the NEWPIN Coding Scheme (Cox, Puckering, Pound, Mills and Owen, 1990.) with the observational measures being derived from the literature and previous research in the parenting field. The codes were validated experimentally, showing coherent interrelationships and a correspondence with child behaviour problems. Inter-rater reliability has been established at 0.85 level. The main coding domains of the Mellow Parenting Scheme are Anticipation (positive and negative), Autonomy (positive and negative), Responsiveness (positive and negative), Cooperation (positive and negative), Distress (positive and negative), and Control. The Anticipation (+/-) domain was a measure of the parent's ability to prepare the child for changes in activity or care-taking. Lapsed or negative anticipation occurred when the parent failed to set up the child for some activity and then complained to the child. Codes contained within this domain include facilitation, and lapsed facilitation. The Autonomy (+/-) domain was a measure of the parent's awareness of the child's individuality, wishes, needs and timing, or acknowledgement of feelings. Poor practice occurred when autonomy is not given,

where the parent was intrusive or the child's protest is ignored or handled in a negative way. Codes within this domain included checks, enable/encourage, monitor, protest-mother-follow-positive, and protest-mother-follow-negative. The Responsiveness (+/-) domain was a measure of the parent's ability to mesh with the child i.e. the ability of the parent or child to make a cognitive elaboration to the other's focus of interest. Dimension codes included links, mother-follow-positive, approval, positive affect, and criticisms. The Cooperation (+/-) domain was a measure of the parent's ability to respond to the child's distress. Parent's could precipitate the distress or fail to support a distressed child. Domain codes included distress-mother-follow-positive and distress-mother-follow-negative. The final domain – Control – was a measure of the parent's intention to achieve compliance from the child regardless of the child's agenda. Each control sequence was coded independently with the control issue being considered for legitimacy and appropriateness for the parent to be pursuing. The content of the argument was noted and whether the control issue was nicely and effectively handled, or not, was noted. How the control sequence ended was also noted as was the interaction which followed its conclusion. As can be seen, this coding scheme comprehensively takes into account aspects of the dyadic relationship between parent and child and has codes and measures of emotional tone and content of the relationship.

A copy of the coding scheme developed through the current research plus explanatory manual is contained in Appendix 3.2. Each meal sequence was coded using all events coding and the inter-rater reliability of the coding scheme has been established as $K = 0.82$. Coded data gathered was related to data already held on the subjects, including food intake, meal duration, height and weight at 13m, as well as socio-demographic data

on the mother and her scores on the Edinburgh Postnatal Depression Scale (Cox et al, 1987) and the Dutch Eating Behaviour Questionnaire (van Strien et al, 1986.)

Data Analysis

In analyzing data, both meal sequences per child were collapsed together to provide a total mother-child interaction profile per child. As count data have a lower bound of zero and are usually skewed, non-parametric methods were used in analysis of data gathered. Preliminary analyses consisted of descriptive statistics of demographic data with t, Mann-Whitney U or Chi-Square tests being used as appropriate to examine differences between groups. Psychometric properties of the coding scheme were analyzed using Cohen's Kappa co-efficient statistic for inter-rater reliability and correlation coefficients (Spearman's rho for non-parametric data) used to assess validity of the coding scheme domains. To analyze group differences, Mann Whitney U tests were calculated. Effect sizes were reported using Cohen's convention for effect size (Cohen, 1988.) As the literature in this area is limited, Bonferroni Corrections were not taken into account as by being overly conservative, there was a possibility of overlooking significant effects.

Results

Description of Demographic Characteristics of Sample

The analyses conducted were based on 30 cases and 29 controls, although 1 control infant had only one recorded meal sequence. Table 1 contains demographic characteristics for the two groups.

INSERT TABLE 1 ABOUT HERE

As can be seen, the birth weight for the two groups were similar but the weight and thrive index at the time of assessment were significantly different (weight at assessment: $t=-8.5$, $df=57$, $p=0.000$; thrive index at assessment: $t= -12.37$, $df= 57$, $p = 0.000$.) Other significant differences between groups were observed in terms of duration of breastfeeding ($t = -2.13$, $df = 56$, $p = 0.037$) and age of first solids ($t = 2.05$, $df = 49$, $p = 0.046$.) Cases and controls were not matched on any variables prior to observation and differed significantly in terms of religious background ($\chi^2= 5.28$, $p = 0.022$.) It was also observed that cases were more likely to be 2nd or later born, which indicated that in over 2/3 case families, the mother was caring for more than one child at a time, a finding also reported by Drewett at al (1999.)

Psychometric Properties of Coding Scheme

Inter-rater Reliability

Inter-rater reliability was measured using Cohen's Kappa co-efficient statistic and was established at 0.82 level.

Descriptive Statistics & Inter-Correlation of Coding Scheme Domains

Table 2 contains descriptive statistics for domains within the coding scheme.

INSERT TABLE 2 ABOUT HERE

For both cases and controls, low level negative behaviours were observed within the Anticipation (-), Autonomy (-), Responsiveness (-), Cooperation (-), Distress (-), and

Control domains. In terms of positive behaviours observed, higher average levels were observed among control mothers across all domains. However, low level behaviours were observed for both cases and controls within the Distress (+) domain. Given the low level of observed behaviour within the negative domains and within the Distress (+) domain, these domains were not considered for further statistical analysis.

Table 3 contains correlation coefficients for the four positive domains under consideration: Anticipation (+), Autonomy (+), Responsiveness (+) and Cooperation (+).

INSERT TABLE 3 ABOUT HERE

Significant inter-correlations were observed among the four positive domains analyzed suggestive of coherent inter-relationships among these domains.

Analysis of Hypotheses

To examine whether significant differences occurred within the four positive domains – Anticipation (+), Autonomy (+), Responsiveness (+), and Cooperation (+) – Mann Whitney U-tests were computed. Table 2 contains details of these statistics. As can be seen, significant differences occurred between groups across all four positive domains: Anticipation (+) ($u = 260.00$, $N1 = 30$, $N2 = 28$, $p = 0.013$) ($d = 0.33$, small/medium effect size); Autonomy (+) ($u = 231.00$, $N1 = 30$, $N2 = 28$, $p = 0.003$) ($d = 0.00$, small/medium effect size); Responsiveness (+) ($u = 240.00$, $N1 = 30$, $N2 = 28$, $p = 0.005$) ($d = 0.38$, small/medium effect size); Cooperation (+) ($u = 265.00$, $N1 = 30$, $N2 = 28$, $p = 0.016$)

($d = 0.32$, small/medium effect size.) This is suggestive that the quality of parent-child relationship is significantly different between cases and controls with case mothers engaging in lower levels of positive interaction with their infants. Low level negative behaviours occurred across both groups and were not included for further analyses due to floor effects. As such it was not possible to address the hypothesis that case mothers engaged in higher levels of negative interaction as it occurred infrequently throughout the entire sample.

As the population under investigation contained a small sub-sample of case mothers ($n=5$) from a particular religious background, known to have particular religious beliefs related to diet, the analysis was recalculated with this subgroup removed to determine whether this population were accounting for observed results. Removing this sub-sample ameliorated the significant differences observed in terms of breastfeeding duration and age at first solids. The differences in terms of weight at assessment and thrive index remained statistically significant (weight at assessment: $t = -10.310$, $df = 52$, $p = 0.000$; thrive index: $t = -11.276$, $df = 52$, $p = 0.000$). No other significant demographic differences were observed when this population was removed from the analysis.

Table 4 contains descriptive statistics, Mann-Whitney U-Tests and effect sizes across the four positive domains with this specific religious group removed.

INSERT TABLE 4 ABOUT HERE

As can be seen, significant differences remained for the Anticipation (+), Autonomy (+), and Responsiveness (+) domains with the Cooperation (+) domain achieving borderline significance. In addition, effect sizes do not change following removal of this group from the analysis. This is indicative that the small sample of mothers with specific faith backgrounds were not driving significant group effects.

Discussion

The aims of the current study were to develop a version of the Mellow Parenting coding scheme to be used within an infant weight faltering population and to examine its psychometric properties within this population. It was hypothesized that the quality of parent-child interaction would be significantly different among case mother-infant dyads as compared to healthy controls. It was also hypothesized that mothers of infants with weight faltering would engage in lower levels of positive interaction with their children and higher levels of negative interaction during mealtime situations.

The simplified version of the Mellow Parenting scheme developed was demonstrated to have an excellent inter-rater reliability of 0.82 as measured by Cohen's Kappa co-efficient statistic (Martin and Bateson, 1993.) The scheme was also shown to have coherent inter-relationships between positive domains (Anticipation, Autonomy, Responsiveness, and Cooperation.) Low level negative parent-child interaction was observed in both cases and controls and, as such, it was not feasible to investigate differences in levels of negative interaction further. This may be indicative of a validity problem within the sample as opposed to a lack of validity within the domains of the coding scheme, given

that the positive domains were demonstrated to have significant inter-relationships. In terms of discriminative validity, the coding scheme was demonstrated to significantly differentiate weight faltering infants from healthy controls on measures of Anticipation (+), Autonomy (+), Responsiveness (+), and Cooperation (+). However, the case mothers contained a small sample (n=5) of mother-infant dyads from a specific religious background known to have certain dietary restrictions based on their religious beliefs. Statistically significant group effects were demonstrated in measures of Anticipation (+), Autonomy (+) and Responsiveness (+) when this sub-sample were removed from the analysis and borderline significant effects observed within the Cooperation (+) domain.

The current study is the largest study of parent-child interaction in infant weight faltering to date, and benefited from the use of a birth cohort sample free from selection bias. The study investigated the use of a well-validated measure of parent-child interaction and its internal validity was enhanced by the double blind design. However, the current study is retrospective in nature and it is therefore not possible to examine whether the interactional patterns observed followed or preceded the infant weight faltering. Furthermore, all case children studied met criteria for mild-moderate weight faltering and it is possible that further significant group effects would be highlighted in a study of more severely affected children. In addition, the coding scheme is still lengthy and its application complex. Clinicians in the field would have to be trained in the subtleties of the scheme and its application to videoed mealtime scenarios, which would be of benefit to the clinician, but costly to services. Future research could focus on the refinement of the coding scheme developed within this study in an attempt to develop a brief clinical

tool to assess parent-child interaction. However one of the major strengths and attractions of the Mellow Parenting Scheme is its inclusive, comprehensive nature which could be lost within further simplification of the scheme.

It is interesting to consider the key constructs identified as being important to the mother-child interaction – Autonomy (+), Anticipation (+), Responsiveness (+), Cooperation (+) – in relation to previous observational research conducted in the field of attachment theory. In an intensive observational study of 26 Baltimore families, recruited prenatally, Ainsworth et al (1978) collected approximately 72 hours of data per family to examine behaviour patterns in context including an examination of the Strange Situation test. This study identified 4 rating scales of maternal behaviour – Sensitivity, Acceptance, Cooperation, and Accessibility – which were found to be key to mother-child interaction and strongly related to attachment security. Indeed findings suggested that maternal sensitivity, the parent's ability to mesh their response to the infant's signals and communication to form dyadic interaction patterns of interaction, is most influential in affecting the child's reactions and in fostering attachment security. Many subsequent studies have reported positive sensitivity-security associations (Susman-Stillman et al, 1996; Teti et al, 1995; Vondra et al, 1995) and a recent meta-analysis found that interventions most effective in encouraging maternal sensitivity were also more likely to enhance mother-infant attachment security (Bakermans-Kranenburg et al, 2003.)

Three of the dimensions identified in the current study – Anticipation, Autonomy, and Responsiveness – taken collectively could be described as maternal sensitivity; the ability

of the parent to perceive signals accurately and respond to them promptly and adequately. This would suggest that in the current study, control mothers exhibited higher levels of maternal sensitivity than case mothers. Indeed in an observational study of 115 healthy children, feeding problems were predicted by the interaction between infant temperament and maternal sensitivity and by age 2 years infants were reported to have more problems if their mothers were less sensitive to their signals (Hegekull et al, 1997.) Furthermore, given the maternal sensitivity-attachment security association, it could be hypothesized that control children within this study were more securely attached than the case children. This would concur with previous research findings that among failure to thrive populations, there is a greater proportion of insecure attachments. However, as attachment was not directly studied, this can only remain a hypothesis. Nonetheless the concepts from attachment theory provide a good theoretical framework for understanding and conceptualizing the results from the current study.

This study has developed a measure of parent-child interaction specific to infant weight faltering which indicated low level negative reciprocity among both mother-infant dyads with and without weight faltering. It also demonstrated that healthy control mother-infant dyads displayed higher levels of positive reciprocity than case mother-infant dyads. Batchelor (1999) proposed that there is a cycle of interactions within weight faltering in which parental stress at mealtimes, which is in part driven by health professional concerns, is picked up on by the child, leading to feeding situations becoming more stressful and thus compounding the difficulties further. It is a possibility that as a result of high stress levels at mealtime situations, parents of weight faltering infants become

less interactive with their child as a means of attempting to minimize the anxiety surrounding mealtimes. However, this is not to suggest a causal relationship between parent-child interaction and infant weight faltering. The aetiology of weight faltering is undoubtedly multidimensional with no one factor in itself causal. A multifactorial model of weight faltering has been proposed which argued that the focus of examination should be on the family system as opposed to just the mother. (Lieberman and Birch, 1985; Drotar, 1991.) The ability of a parent to cope with their child will be dependent on a number of factors, including child characteristics and psychosocial/ familial stressors (Belsky and Vondra, 1989) and these factors must be accounted for in consideration of the role of parenting in infant weight faltering.

Indeed it could be argued that a focus on parental behaviours is insufficient and that there needs to be a consideration of the influences that underlie the parent's behaviour and their contribution to infant weight faltering (Boddy and Skuse, 1994.) Traditionally, research in the field has paid little attention to the role of psychosocial factors despite it being known that specific psychosocial stressors are associated with parenting difficulties and developmental problems, for example maternal psychopathology (Seifer and Dickstein, 1993); poverty and social class (Parker et al, 1988); familial and social risk factors (Zeanah et al, 1997) and maternal history (Boddy and Skuse). Maternal depression is associated with a variety of problems in both parenting behaviours and in infants born to depressed women (Field, 1992; Seifer and Dickstein, 1993) and a recent systematic literature review found limited evidence to suggest an association between maternal depression and infant weight faltering (Robertson, 2006.) Poverty and socioeconomic

status have also been found to be strongly related to a number of developmental outcomes in infancy, exerting indirect effects through their impact on variables such as availability of resources (i.e. food, shelter, and medical care) and lifestyle issues (e.g. crowding, quality of neighbourhood) (Zeanah et al, 1997.) Poverty and economic loss also increase the risk of emotional distress in parents and heighten their vulnerability to negative life events (e.g. single parenthood, social isolation, depression, anxiety) (Zeanah et al, 1997.) Negative childhood experiences also make individuals more vulnerable to a variety of problems such as psychiatric disorder (Andrews, Brown, and Creasy, 1990) and child rearing difficulties (Dowdney, Skuse, Rutter, Quinton, and Mrazek, 1985.) Further research should perhaps concentrate on elucidating a fuller understanding of the inter-relationships among such risk factors to inform a greater understanding of the aetiology of infant weight faltering.

Another area of psychological theory, less researched in infant weight faltering, and which could contribute to an understanding of the nature of the problem is the role of parental thinking. The role of maternal psychopathology has been prominent in theorizing about the condition but maternal attitudes and beliefs is a lesser studied area (Boddy and Skuse, 1994.) Parental health beliefs, such as a fear of obesity and a desire for a healthy diet, have been linked to weight faltering in infancy (Pugliese, Weyman-Daum, Moses and Lifshitz, 1987.) However in a controlled study of parental attitudes, several intergroup differences in maternal behaviour were observed but no evidence of corresponding attitudinal differences were found (Casey et al, 1984.) Mills and Rubin (1990) proposed an information processing model of parenting which indicated that

parental beliefs regarding child behaviour guide their responses in the parent-child interaction. Parental beliefs, it was argued, consisted of cognitive and affective processes that influenced the strategies that parents used in child rearing. The model considered the context of the interaction and counted for factors such as social support and personal well-being. Several studies in support of this model have demonstrated the utility of investigating the emotional and causal attributions that occur during parent-child interaction (Mills and Robin, 1990; Rubin and Mills, 1990), however little attention has been paid to these aspects of parental thinking in infant weight faltering. Research utilizing another measure of parental expressed emotion – the Five Minute Speech Sample (Magana et al, 1986) (FMSS) – has demonstrated that parental expressed emotion is of key importance in several other physical conditions including childhood asthma (Schobinger et al, 1992; Hermanns et al, 1989.) A possible future avenue of research would be to examine the use of the FMSS in parents of children with weight faltering to quantify their verbal expressed emotion related to their children and their condition and investigate any group effects using this methodology. Likewise, expressed emotion using the FMSS could be compared with positive interaction as measured by the current coding scheme to examine whether any correlation exists between the two measures.

Conclusions

The current research developed a coding scheme to analyze parent-child interaction within videoed mealtime scenarios which are part of routine clinical practice in feeding clinics. This coding scheme could be utilized by appropriately trained professionals as a tool for assessment of the feeding interaction, which could highlight aspects of the parent-child relationship where difficulties exist which could be responsive to positive parenting interventions. However, it is unlikely that a single causal relationship explains infant weight faltering and future research should focus on attempting to understand how mother-child interaction impacts on infant weight faltering by examining parental cognitions and affective processes such as beliefs, emotions and attributions that guide parental response to the child. A model of parental social cognition would have the capacity to explain why stressors such as child characteristics or psychosocial difficulties lead to weight faltering in some families but not in others (Boddy and Skuse, 1994.) Future research focusing on parental attributions and social cognition will be central to advancing theoretical and aetiological understandings of infant weight faltering.

References

Ainsworth, M.D.S., Blehar, M., Waters, E., & Wall, S. (1978) *Patterns of attachment*. Hillsdale, NJ: Erlbaum.

Andrews, B., Brown, G.W., & Creasy, L. (1990). Intergenerational links between psychiatric disorders in mothers and daughters: the role of parenting experiences. *Journal of Child Psychology and Psychiatry*, 31, 1115-1129.

Batchelor, J.A. (1999). *Failure to thrive in young children: Research and practice evaluated*. London: The Children's Society.

Bakermans-Lranenburg, M.J., van Ijzendoorn, M.H., and Juffer, F., (2003). Less is more: meta-analyses of sensitivity and attachment interventions in early childhood. *Psychological Bulletin*, 129, 195-215.

Beautrais, A.L., Fergusson, D.M., and Shannon, F.T., (1982). Family life events and behavioural problems in pre-school aged children. *Pediatrics*, 70, 774-779.

Belsky, J. & Vondra, J. (1989). Lessons from child abuse: the determinants of parenting. In D. Cicchetti and V. Carlson (Eds), *Child maltreatment: theory and research on the causes and consequences of child abuse and neglect*. Cambridge: Cambridge University Press.

- Birch, L.L., Marlin, D., & Rotter, J. (1984) Eating as the “means” activity in a contingency effects on young children’s food preferences. *Child Development*, 55, 431-439.
- Boddy, J.M., & Skuse, D.H. (1994). The process of parenting in failure to thrive. *Journal of Child Psychology and Psychiatry*, 35 (3), 401-424.
- Bowlby, J. (1969). *Attachment and loss: attachment*. Volume 1. London: Hogarth Press.
- Bruner, J. (1985) *Child’s Talk: Learning to Use Language*, WW Norton, New York & London.
- Caldwell BM & Bradley RH (1984) *Home observation for measurement of the environment. Administration manual*. Little Rock, Arkansas, University of Arkansas.
- Casey, P.H., Bradley, R., & Wartham, B. (1984). Social and nonsocial environments of infants with non-organic failure to thrive. *Pediatrics*, 73, 348-353.
- Casey, R., & Rozin, P. (1989) Changing food preferences: parent options. *Appetite*, 12, 171-182.
- Chatoor, I. (1997). Feeding disorders of infants and toddlers. In S Greenspan, S Wieder & J. Osofsky (Eds.), *Handbook of child and adolescent psychiatry, Vol.1. Infants and pre-schoolers: Development and syndromes* (pp. 367-386) New York: Wiley.

Chatoor, I. (2000). Feeding and eating disorders of infancy and early childhood. In Kaplan, H.I., & Sadock, B.J., (Eds.) *Comprehensive Textbook of Psychiatry, Vol VII*, Baltimore: Williams & Wilkins, 2704-2710.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences* (2nd ed). Hillsdale, NJ: Erlbaum.

Cox, J.L., Holden, J.M., & Sagovsky, R. (1987). Detection of postnatal depression: development of the 10 item Edinburgh postnatal depression scale. *British Journal of Psychiatry*, 150: 782-786.

Cox, A.D., Puckering, C., Pound, A., Mills, M., & Owen, A.L., (1990) *The evaluation of a home visiting and befriending scheme*. NEWPIN Final Report to the Department of Health.

Douglas, J. (2002). Psychological treatment of food refusal in young children. *Child and Adolescent Mental Health*, Vol. 7, No. 4, pp. 173-180.

Dowdney, L., Skuse, D., Rutter, M., Quinton, D. & Mrazek, D. (1985) The nature and quality of parenting provided by women raised in institutions. *Journal of Child Psychology and Psychiatry*, 26, 599-626.

Drewett, R., Corbett, S., & Wright, C. (1999). Cognitive and educational attainments at school age of children who failed to thrive in infancy: a population based study. *Journal of Child Psychology and Psychiatry*, 40, 551-556.

Drotar, D. (1991). The family context of non-organic failure to thrive. *American Journal of Orthopsychiatry*, 61, 23-34.

Drotar, D., Eckerle, D., Satola, J., Paclotla, J., & Wyatt, B. (1990). Maternal interactional behaviour with non-organic failure to thrive infants: a case comparison study. *Child Abuse & Neglect*, 14, 41-51.

Field, T. (1992). Infant of depressed mothers. *Developmental Psychopathology*, 4, 49-66.

Gordon, A.H. & Jameson, J.C. (1979). Infant-mother attachment in patients with non-organic failure to thrive syndrome. *Journal of the American Academy of Child Psychiatry*, 18, 251-259.

Hepinstall, E., Puckering, C., Skuse, D., Start, K., Zur-Spiro, S., & Dowdney, L. (1987). Nutrition and mealtime behaviour in families of growth retarded children. *Human Nutrition: applied nutrition*, 41a, 390-402.

Hermanns, J., Florin, I., Dietrich, M., Kleger, C. & Hahlweg, K. (1989). Maternal criticism, mother-child interaction, and bronchial asthma. *Journal of Psychosomatic Research*, 33 (4), 469-476.

Kasese-Hara, M. (1997). *Feeding behaviour and appetite in young children with non-organic failure to thrive*. PhD thesis, Department of Psychology, University of Durham, England.

Klesges, R.C., Coates, T.J., Brown, G., Sturgeon-Tillisch, J., Moldenhauer-Klesges, L.M., Holzer, B., Woolfrey, J., & Vollmer, J., (1983) Parental influences on children's eating and behaviour and relative weight. *Journal of Applied Behaviour Science*, Vol 16, No. 1, pp. 371-378.

Kovisto, U.K., Fellenius, J, & Sjoden, P.O., (1994). Relations between parental mealtime practices and children's food intake. *Appetite*, Vol, 22, 245-258.

Lieberman, A.F. & Birch, M. (1985). The etiology of failure to thrive: an interventional developmental approach. In D. Drotar (Ed), *New Directions in Failure to Thrive: implications for research and practice*. NY: Plenum Press.

Luiselli, J.K. (1989). Behavioural assessment and treatment of pediatric feeding disorders in developmental disabilities. *Progress in Behaviour Modification*, 24, 91-131.

Magana, A.B., Goldstein, M.J., Karno, M., Miklowitz, D.J., Jenkins, J., & Falloon, I.R.H. (1986). A brief method for assessing expressed emotion in relatives of psychiatric patients. *Psychiatric Research*, 17, 203-212.

Martin, P., & Bateson, P. (1993). *Measuring Behaviour – An Introductory Guide*. 2nd Edition, Cambridge University Press.

Mills, M., Puckering, C., Pound, A., and Cox, A.D. (1985) What is it about depressed mothers that influences their children's functioning? In J.E. Stevenson (Ed), Recent Research in Developmental Psychopathology. Book Supplement to the *Journal of Child Psychology and Psychiatry*, No. 4, 11-17.

Mills, R.S.L. & Rubin, K.H. (1990). Parental beliefs about problematic social behaviours in early childhood. *Child Development*, 61, 138-151.

Parker, S., Greer, S. & Zuckerman, B (1988). Double jeopardy: the impact of poverty on early child development. *Pediatric Clinics of North America* 35: 1227-1240.

Parkinson, K.N. & Drewett, R.F. (2001). Feeding behaviour in the weaning period. *Journal of Child Psychology and Psychiatry*, 42, 971-978.

Parkinson, K.N., Wright, C.M., and Drewett, R.F., (2004). Mealtime energy intake and feeding behaviour in children who fail to thrive: a population-based case-control study. *Journal of Child Psychology and Psychiatry*, Vol 45, No 5, pp 1030-1035.

Pollitt, E., Eichler, A.W., & Chan, C. (1975). Psychosocial development and behaviour of mothers of failure to thrive children. *American Journal of Orthopsychiatry*, 45 (4), 525-537.

Puckering, C., Pickles, A., Skuse, D., Heptinstall, E., Dowdney, L., and Zur Spiro, S. (1995). The role of mother child interaction in the cognitive and behavioural development of four-year-old children with non-organic failure to thrive. *Journal of Child Psychology and Psychiatry*, 36, 573-595.

Puckering, C., Rogers, J., Mills, M., Cox, A.D., Mattsson-Graff, M., (1994) Process and evaluation of a group intervention for mothers with parenting difficulties. *Child Abuse Review*, 3, 299-310.

Puckering, C., Evans, J., Maddox, H., Mills, M., and Cox, A.D. (1996) Taking control: a single case study of mellow parenting. *Clinical Child Psychology and Psychiatry* 1 (4): 539-550.

Pugliese, M.T., Weyman-Daum, M., Moses, N. & Lifshitz, F. (1987). Parental health beliefs as a cause of non-organic failure to thrive. *Pediatrics*, 80, 175-182.

Robertson, J. (2006). Maternal depression and infant weight faltering: a systematic review of literature. Doctoral Thesis, Unpublished.

Rubin, K.H. & Krasnar, L.R. (1986). Social-cognitive and social behavioural perspectives on problem solving. In M. Perlmutter (Ed), *Cognitive perspectives on children's social and behavioral development*, New Jersey, Lawrence Erlbaum.

Sanders, M.R., Patel, R.K., Le Grice, B., and Shepherd, R.W., (1993). Children with persistent feeding difficulties: an observational analysis of the feeding interactions of problem and non-problem eaters. *Health Psychology*, Vol. 12, No. 1., pp. 64-73.

Schobinger, M.R., Florin, I., Zimmer, C., Lindemann, H., & Winter, H. (1992). Childhood asthma: paternal criticism, attitude, and father-child interaction. *Journal of Psychosomatic Research*, 36, 8, 743-750.

Seifer, R. & Dickstein, S. (1993). Parental mental illness and infant development. In C.H. Zeanah (Ed), *Handbook of Infant Mental Health*, pp 120-142. NY: Guilford.

Shapiro, V., Fraiberg, S. & Adelson, C. (1976). Infant-parent psychotherapy on behalf of a child in a critical nutritional state. *The Psychoanalytic Study of the Child*, 31, 461-491.

Stein, A., Woolley, H., Cooper, S.D., and Fairburn, C.G., (1994). An observational study of mothers with eating disorders and their infants. *Journal of Child Psychology and Psychiatry*, Vol 35, No 4, pp 733-748.

Stern, D. (1985). *The Interpersonal World of the Child*. New York: Basic Books

Stroufe, L.A., (1979) The coherence of individual development: early care, attachment, and subsequent developmental issues. *American Psychologist*, 34, 834-841.

Susman-Stillman, A., Kalkose, M., Egeland, B., and Waldman, I., (1996). Infant temperament and maternal sensitivity as predictors of attachment security. *Infant Behaviour & Development*, 19, 33-47.

Teti, D.M., Gelfand, D.M., Messinger, D.S., and Isabella, R. (1995). Maternal depression and the quality of early attachment: an examination of infants, preschoolers, and their mothers. *Developmental Psychology*, 31, 364-376.

Ward, M.J., Lee Shelley, S. & Lipper, E.G. (2000). Failure to thrive is associated with disorganized infant-mother attachment and unresolved maternal attachment. *Infant Mental Health Journal*, 21 (6), 428-442.

Wolke, D., Skuse, D. & Mathisen, B. (1990). Behavioural style in failure to thrive infants: a preliminary communication. *Journal of Pediatric Psychology*, 15, 237-254.

Wright, C.M., Avery, A., Epstein, M., Birks, E., & Croft, D. (1998). New chart to evaluate weight faltering. *Archives of Disease in Childhood*, 78, 40-43.

Van Strien T., Frijters J.E.R., Bergers G.P.A., & Defares P.B. (1986). The Dutch Eating Behavior Questionnaire (DEBQ) for assessment of restrained, emotional and external eating behavior. *International Journal of Eating Disorders*, 5, 295-315.

Vondra, J.L., Shaw, D.S., and Kevenides, M. (1995). Predicting infant attachment classification from multiple, contemporaneous measures of maternal care. *Infant Behavior & Development*, 18, 415-425.

Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Zeanah, J. (1997). Infant development and developmental risk: a review of the past 10 years. *Journal of American Academy of Child and Adolescent Psychiatry*, 36 (2), 1-21.

Table 1. Characteristics of case and control children studied

	Cases (n=30)	Controls (n=29)
Birth Weight (kg)	3.54 (0.48)	3.47 (0.43)
Birth Weight in Z-Scores	0.13 (1.02)	-.01 (0.95)
13-21 month assessment weight (kg)**	8.88 (0.71)	10.82 (1.01)
13-21 month weight Z-Score**	-1.78 (0.65)	0.20 (0.84)
13-21 month Thrive Index**	-1.78 (0.35)	0.20 (0.81)
Child's Age (at first meal, in months)	15.8 (0.13)	15.4 (0.01)
Males	47% (14)	48% (14)
First Born	30% (9)	55% (16)
Mother's age	29.6 (6.51)	28.7 (5.73)
<i>Family</i>		
Caucasian	100% (30)	100% (29)
Has wage earner	77% (23)	75% (22)
Home Owner	77% (23)	55% (16)
Car owner or has use of a car	74% (22)	72% (21)
Maternal Depression EPDS Score	5.64 (3.51)	6.62 (4.54)
Townsend Deprivation Score	2.83 (1.60)	2.80 (1.01)
Religion		
▪ Christian / Other	25 (83%)	29 (100%)
▪ Specific Religious Background	5 (17%)	0 (0%)
Breastfeeding duration*	2.2 (1.30)	2.90 (1.17)
Age (wks) first solids*	16.63 (5.26)	14.33 (1.69)

The figures show the mean (SD) or percentage (n).

* significant at 0.05 level

** significant at 0.01 level

Table 2: Descriptive and Inferential Statistics for Positive Domains

	Mean	Median	Standard Deviation	Inter-quartile Range	Range	Mann Whitney U test	Effect Size
Anticipation (+)							
▪ Cases	11.00	6.50	12.36	12.25	45.00	U = 260.00 Z = -2.492 P = 0.013	0.33 (small/medium)
▪ Controls	14.54	13.50	7.67	11.25	29.00		
Anticipation (-)							
▪ Cases	0.33	0.00	0.18	0.00	1.00	n/a	
▪ Controls	0.00	0.00	0.00	0.00	0.00		
Autonomy (+)							
▪ Cases	21.63	15.50	16.70	20.25	78.00	U = 231.00 Z = -2.943 P = 0.003	0.33 (small/medium)
▪ Controls	35.25	33.00	19.50	29.25	85.00		
Autonomy (-)							
▪ Cases	0.667	0.000	0.25	0.00	1.00	n/a	
▪ Controls	0.286	0.000	0.85	0.00	4.00		
Responsiveness (+)							
▪ Cases	42.53	25.5	45.26	40.00	199.00	U = 240.00 Z = -2.801 P = 0.005	0.38 (small/medium)
▪ Controls	64.32	61.5	41.86	50.75	208.00		
Responsiveness (-)							
▪ Cases	0.233	0.000	0.63	0.00	2.00	n/a	
▪ Controls	0.500	0.000	1.04	0.75	4.00		
Cooperation (+)							
▪ Cases	38.67	26.50	37.66	0.00	171.00	U = 265.00 Z = -2.412 P = 0.016	0.32 (small/medium)
▪ Controls	52.54	50.50	30.28	0.75	112.00		
Cooperation (-)							
▪ Cases	0.13	0.00	0.35	33.75	1.00	n/a	
▪ Controls	0.64	0.00	1.50	37.50	6.00		
Distress (+)							
▪ Cases	1.47	0.00	4.70	1.00	26.00	n/a	
▪ Controls	1.43	0.50	2.52	2.00	12.00		
Distress (-)							
▪ Cases	0.37	0.00	0.85	0.25	4.00	n/a	
▪ Controls	0.64	0.00	1.54	1.00	8.00		
Control							
▪ Cases	0.33	0.00	0.18	0.00	1.00	n/a	
▪ Controls	0.71	0.00	0.38	0.00	2.00		

Table 3: Correlation Coefficients for Domains

	Anticipation (+)	Autonomy (+)	Responsiveness (+)	Cooperation (+)
Anticipation (+)		$r = 0.630^{**}$ $p = 0.000$	$r = 0.708^{**}$ $p = 0.000$	$r = 0.714^{**}$ $p = 0.000$
Autonomy (+)	$r = 0.630^{**}$ $p = 0.000$		$r = 0.666^{**}$ $p = 0.000$	$r = 0.647^{**}$ $p = 0.000$
Responsiveness (+)	$r = 0.708^{**}$ $p = 0.000$	$r = 0.666^{**}$ $p = 0.000$		$r = 0.731^{**}$ $p = 0.000$
Cooperation (+)	$r = 0.714^{**}$ $p = 0.000$	$r = 0.647^{**}$ $p = 0.000$	$r = 0.731^{**}$ $p = 0.000$	

Table 4: Descriptive Statistics and Inferential Statistics for Sample minus mother-infant dyads of Specific Religious Background across positive domains

	Mean	Median	Standard Deviation	Inter-quartile Range	Range	Mann Whitney U test	Effect Size
Anticipation (+)						U = 229.50	
▪ Cases	12.00	7.00	13.01	11.00	45.00	Z = -2.149	0.30
▪ Controls	14.54	7.67	7.67	11.25	29.00	P = 0.032	
Autonomy (+)						U = 205.50	
▪ Cases	23.04	16.00	17.33	24.00	73.00	Z = -2.576	0.35
▪ Controls	35.25	33.00	19.50	29.25	85.00	P = 0.010	
Responsiveness (+)						U = 224.0	
▪ Cases	47.48	27.00	47.40	43.50	193.00	Z = -2.245	0.31
▪ Controls	64.32	61.50	41.88	50.75	208.00	P = 0.025	
Cooperation (+)						U = 243.00	
▪ Cases	42.54	29.00	39.66	35.50	170.00	Z = -1.907	0.26
▪ Controls	52.54	50.50	30.28	37.50	112.00	P = 0.057	

Chapter 5: Abstract of Single Case Research Study

A structured teaching intervention to reduce challenging behaviours in a 15 year old adolescent with learning disabilities and an autistic spectrum disorder

Joanne Robertson

Prepared in accordance with requirements for submission to the Journal of Autism and Developmental Disorders.

Submitted in partial fulfilment of the requirements for the degree of Doctor of Clinical Psychology.

***Address for Correspondence:
Joanne Robertson
Section of Psychological Medicine
Division of Community Based Sciences
University of Glasgow
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow G12 0XH
Tel: 0141 211 3920
Fax: 0141 357 4899
E-mail: 9608041r@student.gla.ac.uk**

Abstract

There is strong evidence to suggest that structured teaching, utilising individualised visual activity schedules, are effective in reducing challenging behaviours among individuals with Autistic Spectrum Disorders. This paper describes a structured teaching intervention to reduce challenging behaviours in a 15 year old adolescent with severe learning disabilities and autism. This study also aimed to examine whether such an intervention had an impact on parental perceptions of perceived difficulty in managing their child's behaviour and whether it improved their perception of the quality of relationship they had with their child. A single subject A-B research design was used in the investigation of these aims. The results of the study demonstrated a statistically significant reduction in the adolescent's challenging behaviour as reported by her mother. These results did not generalize to other environments where challenging behaviour was being displayed. In addition, there was a statistically significant reduction in maternal perception of the difficulty experienced in managing these behaviours plus a statistically significant improvement in maternal perception of quality of relationship with her child. Positive results were maintained for up to 12 months following the assessment. Implications in terms of future research and clinical practice are considered.

Chapter 6: Appendices

		Pages
Appendix 1	Small Scale Service Related Project	124-131
1.1	Guidelines for Health Bulletin	
1.2	Letter to staff	
1.3	Information Sheet	
1.4	Consent Form	
1.5	Questionnaire	
Appendix 2	Systematic Literature Review	132-143
2.1	Guidelines for Child Development	
2.2	Pre-test proforma of inclusion/ exclusion criteria	
2.3	Systematic Literature Review Excluded Studies	
2.4	Methodology Checklist for Systematic Literature Review	
Appendix 3	Major Research Project	144-165
3.1	Guidelines for Child Development	
3.2	Coding Manual	
3.3	Coding Sheet	
3.4	Coding Summary Sheet	
3.5	Ethical Approval	

Appendix 1: Small Scale Service Related Project

Appendix 1.1

Notes for Contributors – Health Bulletin

Papers, articles and other contributions should be sent to the Editor, *Health Bulletin*, Scottish Executive Health Department, Room IE05, St Andrew's House, Edinburgh EH1 3DE. They must be submitted exclusively for *Health Bulletin*. Acceptance is on the understanding that editorial revision may be necessary. All papers are reviewed by the Editor and by peer review, referees being drawn from a panel of appropriate professionals. No correspondence can be entered into in relation to articles found to be unsuitable and returned to authors.

Potential contributions can be submitted in two ways. Material submitted for publication must be typewritten on one side of the paper only, in double spacing and with adequate margins, and each page should be numbered. The top typed copy should be submitted, with four other copies. We are willing to receive one copy typewritten in the above format and accompanied by a disk (Microsoft Word version 98, Excel for tables and figures). All papers should be prefaced by a structured Abstract, of about 250 words in length. It should normally contain six clearly headed sections entitled Objective, Design, Setting, Subjects, Results and Conclusion. The name, appointment and place of work of the authors should be supplied on a separate title page. This same page should include the full postal address of one author, to whom correspondence and reprints will be directed. There should be adequate references to any relevant previous work on the subject; these references should appear at the end of the material on a separate page or pages, using the Vancouver style, which in the case of papers in journals includes:

Surname and initials of author(s)

Title of paper

Full name of journal

Year published

Volume number

Opening and closing page numbers

Reference to books should similarly include author's name and initials, full title, edition (if necessary), place of publication, publisher's name, year and, if required, volume number, chapter number or page number.

Short Communications. *Health Bulletin* publishes short communications (not exceeding three pages in length) as a separate section, and we aim to offer speedier publication for these. Material intended for this section should be submitted in the above form, and the covering letter should state the intention.

Copyright. The material in *Health Bulletin* is copyright. Items may be freely reproduced in professional journals, provided that suitable acknowledgment is made and that reproduction is not associated with any form of advertising material. In other cases, permission to reproduce extracts should be sought through the Editor from HMSO (Copyright Section) which controls the copyright.

Proofs

Contributors will receive one set of proofs. This should be read carefully for printer's errors, and any tables, figures and legends should be checked. Alterations should be kept to a minimum, and the proofs should be returned promptly.

Reprints

One hundred reprints will be supplied free of charge. A limited extra number (for which a charge will be made) may be ordered from the Editor when the proofs are returned.

Appendix 1.2

Letter to Staff for Small Scale Service Related Project (to be on headed paper)

Staff member
CMHT

Dear Colleague

As you are aware I am currently undertaking a research study investigating staff experiences of sexual abuse disclosure among patients with severe mental illness as part of the course requirements for my clinical psychologist training. It would be helpful if you could complete and return the enclosed survey as soon as possible, but before (DATE).

Please return to myself at the address on the bottom of the survey in the envelope provided. If you have any questions you can contact me at the department on Thursday or Fridays. Thank you for taking the time to complete this.

Yours sincerely

Joanne Robertson
Trainee Clinical Psychologist

Appendix 1.3

Information Sheet for Small Scale Service Related Project (to be on headed paper)

Date:

Version Number:

Title: - The identification and treatment of sexual abuse disclosure among patients diagnosed with a schizophrenia spectrum disorder: a service evaluation.

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. If there is anything that is not clear, please feel free to contact myself at the contact details provided if you would like more information. Thank you for reading this.

What is the purpose of the study?

Background literature seems to suggest that there may be a relationship between child sexual abuse and adult psychosis and more specifically between child sexual abuse and schizophrenia (Read, 1997.) Staff, in these instances, are likely to play an integral role in the identification and treatment of abuse history and in determining the provision and quality of support for such clients. However previous studies have indicated that only around half of mental health staff have received any specialist training in working with sexual abuse and that there is immense variation in both working knowledge and experience in this area (Campbell and Carson, 1995; Lab et al, 2000.) The current research project will be an evaluation of the current practices with regards identification and treatment of sexual abuse disclosure among patients with severe mental illness and to examine whether there is a perceived need for training in this area among staff. The study requires the completion of a three-page questionnaire, which should take approximately 20 - 30 minutes to complete.

Why have I been chosen?

All staff members of the CMHT at The Stewart Centre will be surveyed. It is up to you to decide whether or not to take part. If you decide to take part, you will be required to sign one of the attached consent forms and return it with the completed survey. All information, which is collected during the course of the research, will be kept strictly confidential. Excerpts from the survey may be made part of the final research report but under no circumstances will your name or any identifying characteristics be included in the final report. You can request a copy of the results of the project by contacting myself at the address supplied after June 2004.

Contact Information

For any further information or to request a copy of the final report please contact:-

Joanne Robertson, Trainee Clinical Psychologist

Department of Psychology, Leverndale Hospital, Crookston Road, Glasgow.

Tel: 0141 211 6629 or 07766 444763

Email: 9608041r@student.gla.ac.uk

Appendix 1.4

Consent Form for Small Scale Service Related Project (to be on headed paper)

Title of Project: The identification and treatment of sexual abuse disclosure among patients with a diagnosis of a schizophrenia spectrum disorder: a service evaluation.

Name of Researcher: Joanne Robertson

1. I confirm that I have read and understand the information sheet dated (version.....) for the above study and have had the opportunity to ask questions.

2. I understand that my participation is voluntary and that I am free to withdraw at any time.

3. I understand that the survey will be kept strictly confidential and that excerpts from the survey may be made part of the final research report, but under no circumstances will any identifying information be included in the final report.

4. I agree to take part in the above study.

Name of Participant:.....

Date.....

Signature.....

Researcher.....

Date.....

Signature.....

Appendix 1.5

Questionnaire for Small Scare Service Related Project

Definition of Sexual Abuse:- “Sexual abuse occurs where sexual acts are performed on, with or sometimes by someone who is unwilling or unable to consent to those acts, or who has been unduly pressurised into consenting within an unequal relationship.” (Brown & Turk, 1992).

1. Have you ever (including currently) worked with clients with a diagnosis of a schizophrenia spectrum disorder (F2 diagnosis) who have been affected by sexual abuse? *Yes/No*

2. Please complete the following table:-

Number of cases on current caseload	
Number of cases with a diagnosis of a schizophrenia spectrum disorder	
Number of cases with a diagnosis of a schizophrenia spectrum disorder with a history of sexual abuse	

3. What is your current practice regarding the detection of abuse in this population – do you routinely ask about sexual abuse? *Yes/No*

4. Are you in favour of universal screening for sexual abuse at the assessment stage? *Yes/No*

5. If abuse is disclosed to you, do you routinely record in the casenotes? *Yes/No*

6. If an abuse history is identified in this client group do you refer to other agencies for input on the abuse issues? *Yes/No*

If yes, please give details:-

- Frequency of referral:-
- Sometimes
- Often
- All the time

Who:- Please state the agency you most commonly refer to

If no, do you work on sexual abuse issues with this client group yourself?

Yes/No

7. Have you ever had training to deal specifically with issues of sexual abuse?
Yes/No

If yes, please give details: -

When:- Less than a month ago Less than a year ago

Over a year ago

Duration:- Less than half a day A day

Over a day

Who gave it:- NHS Outside agency

9. Do you feel that it is part of your role to work on sexual abuse issues with clients with a schizophrenia spectrum disorder?
Yes/No

10. Do you think sexual abuse training should include (please tick):-

	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
What is sexual abuse					
Skills development: Recognising sexual abuse					
Dealing with legal aspects					
Treatment/ Intervention					
Opportunity to receive supervision					

from expert in this area					
-----------------------------	--	--	--	--	--

11. Do you feel you would like to attend training on working with clients affected by sexual abuse? *Yes/No*

12. Do you have a particular interest in working with victims/ survivors of sexual abuse? *Yes/No*

13. Please include any other comments you feel are relevant to working with sexual abuse disclosure in patients with severe mental illness in the space provided:-

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

**THANK YOU FOR YOUR HELP.
YOUR RESPONSES TO THIS SURVEY WILL REMAIN ANONYMOUS
WITHIN THE PRESENTATION OF FINDINGS.**

**Please return by DATE at the latest to:
JOANNE ROBERTSON, TRAINEE CLINICAL PSYCHOLOGIST
LEVERDALE HOSPITAL, DEPT OF PSYCHOLOGY, CROOKSTON
ROAD, GLASGOW, TEL: 0141 211 6629, MOBILE: 07766 444763
EMAIL: 9608041r@student.gla.ac.uk**

Appendix 2: Systematic Literature Review

Appendix 2.1

Notes for Contributors – Child Development

Child Development publishes empirical, theoretical, review, applied, and policy articles reporting research on child development. Published by the interdisciplinary Society for Research in Child Development (SRCD), the journal welcomes relevant submissions from all disciplines.

Types of Articles

Child Development considers manuscripts in formats described below. Inquiries concerning alternative formats should be addressed to the Editor prior to submission. All submissions are expected to be no more than 40 manuscript pages, including tables, references, and figures (but excluding appendices). Authors should provide a justification if the submission is substantially longer. Unless the Editor finds that justification compelling, the submission will be returned to the author for shortening prior to editorial review.

Empirical articles comprise the major portion of the journal. To be accepted, empirical articles must be judged as being high in scientific quality, contributing to the empirical base of child development, and having important theoretical, practical, or interdisciplinary implications. Reports of multiple studies, methods, or settings are encouraged, but single-study reports are also considered. Empirical articles will thus vary considerably in length (approximately 8 to 40 manuscript pages); text and graphics should be as concise as material permits. All modes of empirical research are welcome.

Reviews focus on past empirical and/or on conceptual and theoretical work. They are expected to synthesize or evaluate a topic or issue relevant to child development, should appeal to a broad audience, and may be followed by a small number of solicited commentaries.

Essays describe original concepts, methods, trends, applications, and theories; these may also be accompanied by solicited commentaries.

Child Development and ... are articles that provide readers with tutorials about some new concept or academic specialty pertinent to research in child development. These papers should review the major definitions, methods, and findings of the concept or specialty and discuss past or potential links to child development.

From another perspective is a format in which papers on a focal topic, written by different authors, are published simultaneously. Papers represent diverse perspectives (e.g., authors whose work represents different populations; different disciplines; different theories, methods, or analytic tools). In some cases, calls for submissions on particular topics will be disseminated through SRCD (via e-mail or SRCD publications), and submissions will undergo normal editorial review. In some cases, a submitted manuscript (e.g., an empirical article) may be selected as a lead article for this format, with invited commentaries providing additional perspectives. The editors also welcome suggestions from readers for topics for this format.

Manuscript Submission

Please follow submission requirements carefully, as deviations may slow processing. *Child Development* will not consider for publication any manuscript under review elsewhere or substantially similar to a manuscript already published. At submission, please inform the Editor if the paper has been or is posted on a website. For more information on the SRCD policy on web publications, please visit <http://www.srkd.org/webposting.html>. Editors retain the right to reject manuscripts that do not meet established ethical standards.

Manuscripts should be submitted electronically to the Child Development Online Submission Site at www.srkd.org/CDsubmit/ as a Word or WordPerfect file. Please also submit a cover letter that contains the name(s) of the author(s) and affiliation(s), and the street address, telephone, fax, and electronic mail address of the corresponding author. A corresponding author's submission to *Child Development* implies that all co-authors have agreed to the content and form of the manuscript and that the ethical standards of SRCD have been followed (see the *Child Development* website or pp. 283-284 of the 2000 SRCD Directory). Any financial interest or conflict of interest must be explained to the Editor in the cover letter. The corresponding author is responsible for informing all co-authors, in a timely manner, of manuscript submission, editorial decisions, reviews, and revisions.

The manuscript file should be formatted with double spaced, 12-point type, and should include a single paragraph abstract of 100-120 words. Please follow all guidelines on format, style, and ethics provided in the Publication Manual (5th ed.) of the American Psychological Association. Figures included with initial submissions will not be returned. Therefore, please submit only electronic files or copies of figures. Authors should keep a copy of all correspondence, files, and figures to guard against loss.

Manuscript Review

If you have any questions about your submission, please inquire at cdev@srcd.org or call (734) 998-7310. Each manuscript is handled by the Editor or an Associate Editor who consults with one or more Consulting Editors and/or ad hoc reviewers who have relevant expertise. To ensure blind review, cover sheets are removed before review; authors should avoid including any other information about identity or affiliation in submissions. Copies of the submission and associated correspondence are retained in the SRCD archives. For accepted manuscripts, authors are required to prepare a 300-500 layperson's summary for public dissemination purposes. Details are provided to authors as part of final processing.

There is no charge for publication in *Child Development* unless tabular or graphic materials exceed 10% of the total number of pages. Charges are also levied for changes in proofs other than correction of printer's errors. Any inquiries relating to charges or business matters (including reprint orders) should be addressed to Blackwell Publishers, *Child Development*, Production Coordinator, 350 Main Street, Malden, MA 02148, (781) 388-8200.

Inquiries and suggestions regarding editorial policy may be addressed to: Dr. Lynn S. Liben, Editor, *Child Development*, Department of Psychology, The Pennsylvania State University, University Park, PA 16802, liben@psu.edu. **Please do not send electronic or paper manuscripts to the above address.** Doing so will delay the processing of your manuscript.

Appendix 2.2

Pre-test Proforma of Inclusion/ Exclusion Criteria for Abstract Inclusion in the Systematic Review

Title:

.....

...

	Details of whether present or absent
1. Was the aim of the study to investigate the association between infant weight faltering and maternal depression?	
2. Was the study design experimental or observational with control participants?	
3. Were standard outcome measures of infant weight faltering used?	
4. Were standard outcome measures of maternal depression used?	

Included papers satisfied all 4 of the above criteria. When there was insufficient information available in the abstract to answer the above questions, the paper was requested to check its suitability for inclusion in the review.

Appendix 2.3

Systematic Review Excluded Studies

Bithoney, W.G., Van Sciver, M.M., Foster, S., Corso, S., & Tentindo, C., (1995). Parental stress and growth outcome in growth-deficient children. *Paediatrics*, 96, 4, 707–711.

- Excluded as no measure of maternal depression

Harpham, T., Huttly, S., DeSilva, M.J., & Abramsky, T., (2005). Maternal mental health and child nutritional status in four developing countries. *Journal of Epidemiological Community Health*, 59, 1060-1064.

- Excluded as examined ‘common mental disorders’ with no individual measure of maternal depression

Patel, V., & Prince, M., (2006). Maternal psychological morbidity and low birth weight in India. *British Journal of Psychiatry*, 188, 284-285.

- Excluded as examined association between maternal mental ill health and low birth weight not infant growth

Patel, V., Rahman, A., Jacob, K.S., & Hughes, M., (2004). Effect of maternal mental health on infant growth in low income countries: new evidence from South Asia. *British Medical Journal*, 328, 820-823.

- Excluded as narrative article

Polan, H.J., Polan, M.D., Kessler, D.B., Shindlecker, R., Newmark, M., Stern, D.N., & Ward, M.J., (1991). Psychopathology in mothers of children with failure to thrive. *Infant Mental Health Journal*, 12, 1, 55-64.

- Excluded as examined 'affective disorders' with no individuation of maternal depression from other mental health conditions

Rahman, A., Lovel, H., Bunn, J., Iqbal, Z., & Harrington, R., (2004). Mothers' mental health and infant growth: a case-control study from Rawalpindi, Pakistan. *Child: Care, Health & Development*, 30, 21-27.

- Excluded as examined 'maternal mental health' with no individual measure of maternal depression

Raynor, P., & Rudolf, M.C.J., (1996). What do we know about children who fail to thrive? *Child: Care, Health, & Development*, 22 (4), 241-250.

- Excluded as non-experimental, narrative study

Stein, A., Murray, L., Cooper, P., Fairburn, C.G., (1996). Infant growth in the context of maternal eating disorders and maternal depression: a comparative study. *Psychological Medicine*, 26 (3), 569-574.

- Excluded as no measure of infant weight faltering

Appendix 2.4

Methodology Checklist for Systematic Review, Influenced by SIGN Guideline Grades of Recommendations for Experimental/ Observational Studies

Systematic Literature Review Checklist

Study	
Author	
Year	

1. Evaluation Criteria		Score
1.1 Does the study have a clearly focused question?		0 1
1.2 Does the study have explicit aims?		0 1
1.3 Are all the hypotheses stated?		0 1
2. Selection of Participants		
2.1 Is the population defined?		0 1
2.2 Is the sample size stated?		0 1
2.3 Is the sample size justified by a power calculation?		0 1

2.4 Are the sample demographics stated?		0 1
2.5 Is the sample representative?		0 1
2.6 Are all the exclusion criteria stated?		0 1
2.7 Are all the inclusion criteria stated?		0 1
2.8 Are cases and controls taken from comparable populations?		0 1
2.9 Are the same inclusion/exclusion criteria used for both cases and controls?		0 1
3. Assessment		
3.1 Are outcome measures clearly defined?		0 1
3.2 Are outcome measures reliable? 0 = none reliable 1 = some reliable 2 = most/all reliable		0 1 2

<p>3.3 Are outcome measures valid?</p> <p>0 = none reliable 1 = some reliable 2 = most/all reliable</p>		<p>0 1 2</p>
<p>3.4 If any assessment/outcome measures are not standardized or are adaptations of standardized assessments, have the reliability and validity statistics been stated? Have adaptations been adequately described?</p> <p>0 = adaptations not stated or reliability/validity assessed 1 = unclear or unstated 2 = adaptations stated, statistics given, or no adapted assessments used.</p>		<p>0 1 2</p>
<p>3.5 Is the assessment of outcome blind to exposure status?</p> <p>0 = inadequate (unblinded) 1 = unclear or unstated 2 = adequate</p>		<p>0 1 2</p>
<p>3.6 Is normative data available for appropriate comparisons?</p>		

		0	1
4. Confounding factors			
4.1 Were most potential confounding demographic factors (e.g., age, sex etc) identified and considered in the design?		0	1
4.2 Were most potential confounding clinical factors (e.g., disease severity, vascular disease, duration of medical illnesses etc) identified and considered in the design?		0	1
4.3 Were most potential confounding demographic factors (e.g., age, sex etc) identified and considered in the analysis?		0	1
4.4 Were most potential confounding clinical factors (e.g., disease severity, vascular disease, duration of medical illnesses etc) identified and considered in the analysis?		0	1
5. Statistical Analysis			
5.1 Do the authors determine whether their groups are		0	1

comparable and, if necessary, adjust for baseline differences?		
5.2 Are appropriate statistical tests used?		0 1
5.3 Are the results clearly stated?		0 1
5.4 Are confidence intervals provided?		0 1
5.5 Is there an adequate description of withdrawals? 0 = inadequate or unstated (only numbers, not reasons stated) 1 = partially stated 2 = numbers and reasons provided for each group.		0 1 2
6. Overall assessment of the study		
6.1 How well was the study done to minimize the risk of bias or confounding, and to establish a causal relationship between exposure and effect? 0 = inadequate 1 = somewhat adequate		0 1 2

2 = adequate		
6.2 Are the results of the study generalisable?		0 1
Total score (maximum = ___)		
Overall %		
Overall Grade		

Scoring:

Unless otherwise stated, Yes = 1 point, No = 0 points

Rating:

A= >/=75%

B= 60-74%

C= 50-59%

D= </=49%

Appendix 3: Major Research Project

Appendix 3.1

Notes for Contributors – Child Development

Child Development publishes empirical, theoretical, review, applied, and policy articles reporting research on child development. Published by the interdisciplinary Society for Research in Child Development (SRCD), the journal welcomes relevant submissions from all disciplines.

Types of Articles

Child Development considers manuscripts in formats described below. Inquiries concerning alternative formats should be addressed to the Editor prior to submission. All submissions are expected to be no more than 40 manuscript pages, including tables, references, and figures (but excluding appendices). Authors should provide a justification if the submission is substantially longer. Unless the Editor finds that justification compelling, the submission will be returned to the author for shortening prior to editorial review.

Empirical articles comprise the major portion of the journal. To be accepted, empirical articles must be judged as being high in scientific quality, contributing to the empirical base of child development, and having important theoretical, practical, or interdisciplinary implications. Reports of multiple studies, methods, or settings are encouraged, but single-study reports are also considered. Empirical articles will thus vary considerably in length (approximately 8 to 40 manuscript pages); text and graphics should be as concise as material permits. All modes of empirical research are welcome.

Reviews focus on past empirical and/or on conceptual and theoretical work. They are expected to synthesize or evaluate a topic or issue relevant to child development, should appeal to a broad audience, and may be followed by a small number of solicited commentaries.

Essays describe original concepts, methods, trends, applications, and theories; these may also be accompanied by solicited commentaries.

Child Development and ... are articles that provide readers with tutorials about some new concept or academic specialty pertinent to research in child development. These papers

should review the major definitions, methods, and findings of the concept or specialty and discuss past or potential links to child development.

From another perspective is a format in which papers on a focal topic, written by different authors, are published simultaneously. Papers represent diverse perspectives (e.g., authors whose work represents different populations; different disciplines; different theories, methods, or analytic tools). In some cases, calls for submissions on particular topics will be disseminated through SRCD (via e-mail or SRCD publications), and submissions will undergo normal editorial review. In some cases, a submitted manuscript (e.g., an empirical article) may be selected as a lead article for this format, with invited commentaries providing additional perspectives. The editors also welcome suggestions from readers for topics for this format.

Manuscript Submission

Please follow submission requirements carefully, as deviations may slow processing. *Child Development* will not consider for publication any manuscript under review elsewhere or substantially similar to a manuscript already published. At submission, please inform the Editor if the paper has been or is posted on a website. For more information on the SRCD policy on web publications, please visit <http://www.srcd.org/webposting.html>. Editors retain the right to reject manuscripts that do not meet established ethical standards.

Manuscripts should be submitted electronically to the Child Development Online Submission Site at www.srcd.org/CDsubmit/ as a Word or WordPerfect file. Please also submit a cover letter that contains the name(s) of the author(s) and affiliation(s), and the street address, telephone, fax, and electronic mail address of the corresponding author. A corresponding author's submission to *Child Development* implies that all co-authors have agreed to the content and form of the manuscript and that the ethical standards of SRCD have been followed (see the *Child Development* website or pp. 283-284 of the 2000 SRCD Directory). Any financial interest or conflict of interest must be explained to the Editor in the cover letter. The corresponding author is responsible for informing all co-authors, in a timely manner, of manuscript submission, editorial decisions, reviews, and revisions.

The manuscript file should be formatted with double spaced, 12-point type, and should include a single paragraph abstract of 100-120 words. Please follow all guidelines on

format, style, and ethics provided in the Publication Manual (5th ed.) of the American Psychological Association. Figures included with initial submissions will not be returned. Therefore, please submit only electronic files or copies of figures. Authors should keep a copy of all correspondence, files, and figures to guard against loss.

Manuscript Review

If you have any questions about your submission, please inquire at cdev@srcd.org or call (734) 998-7310. Each manuscript is handled by the Editor or an Associate Editor who consults with one or more Consulting Editors and/or ad hoc reviewers who have relevant expertise. To ensure blind review, cover sheets are removed before review; authors should avoid including any other information about identity or affiliation in submissions. Copies of the submission and associated correspondence are retained in the SRCD archives. For accepted manuscripts, authors are required to prepare a 300-500 layperson's summary for public dissemination purposes. Details are provided to authors as part of final processing.

*There is no charge for publication in *Child Development* unless tabular or graphic materials exceed 10% of the total number of pages. Charges are also levied for changes in proofs other than correction of printer's errors. Any inquiries relating to charges or business matters (including reprint orders) should be addressed to Blackwell Publishers, *Child Development*, Production Coordinator, 350 Main Street, Malden, MA 02148, (781) 388-8200.*

Inquiries and suggestions regarding editorial policy may be addressed to: Dr. Lynn S. Liben, Editor, *Child Development*, Department of Psychology, The Pennsylvania State University, University Park, PA 16802, liben@psu.edu. ***Please do not send electronic or paper manuscripts to the above address.*** Doing so will delay the processing of your manuscript.

Appendix 3.2

The Mellow Parenting Scale for Infant Weight Faltering

Joanne Robertson
Department of Psychological Medicine
University of Glasgow
Gartnavel Royal Hospital
1055 Great Western Road
GLASGOW
G12 0XH

This coding scheme is based on the Mellow Parenting Coding Scheme devised by (Puckering et al, 1994.)

CONTENTS

Summary of Coding Dimensions

Dimension 1: Anticipation (+/-)

FAC/CT
LAPSFAC

Dimension 2: Autonomy (+/-)

CH
EN/ENC
MON
PR/MF+
PR/MF-

Dimension 3: Responsiveness (+/-)

APP
MF+
PA
LNKS
NA
CRIT

Dimension 4: Cooperation (+/-)

SC
THR
FC

Dimension 5: Distress (+/-)

DISMF+
DISMF-

Dimension 6: Control

Parent-Child Interaction

DIMENSIONS OF CODING SCHEME

- 1. ANTICIPATION OF CHILD'S NEEDS**
- 2. AUTONOMY**
- 3. RESPONSIVENESS**
- 4. COOPERATION**
- 5. DISTRESS**
- 6. CONTROL**

Dimension 1: Anticipation (+/-)

Definition of Dimension

- The child is seen to be prepared for changes in activity or care-taking by facilitating a known routine, giving prior warning, providing information or distracting the child so that the parents agenda is easier to achieve and accomplished with the least possible friction between the couple. Negative or lapsed facilitation occurs where the parent fails to set the child up for some activity and then complains.

Definition of Codes

FAC (Facilitate)

- Parent makes activities that involve themselves and the child (either independently or together) easier for or more acceptable to the child.

LAPSFAC (Lapsed Facilitation)

- Occurs when parent fails to set the child up for some activity and then complains or is negative about the child's behaviour resulting from the parental lapse

Example

1. FAC

12 month old child mother plays "airplane" with spoon and then presents to child (FAC)

2. LAPSFAC

24 month old child is handed bowl of cornflakes and is told to eat in living room
Child spills milk on sofa as she sits
Mother: look what you are doing

Dimension 2: Autonomy

Definition of Dimension

- Parent is seen to show an awareness of the child's individuality, wishes, needs and timing or acknowledge feelings. The child is allowed to exercise choice, and to behave spontaneously while the parent monitors ongoing activity. Parent can offer encouragement and help when child is trying things out and heed's protests or complaints. Negative autonomy occurs where parents intrusive or child's protests are dealt with in a negative way.

Definition of Codes

CH (Check)

- Parent verbally or nonverbally tries to determine what it is the child needs or wants.
- Recognition by parent that child is a separate individual with different needs or wants from her own must be implied.

EN/ENC (Enable/ Encourage)

- Parent provides for the successful completion of the child's activity or helps avoid disaster
- Parent encourages the child to become involved in an activity by himself – parent does not have a stake in whether child completes activity or not.

MON (Monitor)

- Parent watches child's activity, allowing the child to determine his own activity and timing.

PR/MF+

- The mother responds in a positive way when the child expresses upset or dislike about what has been done a PRMF- (Protest Mother Follow Negative)

PR/MF-

- Where child complains at parent's treatment or behaviour and parent ignores the child's communication completely or fails to respond to child appropriately and becomes nasty or negative instead.

Examples of coding Dimensions of Autonomy

1. CH (Parent Check)

12 month old child mother holds up both an apple and a banana in front of the child
"which do you want?"(CH)

2. EN/ENC (Enable/ Encourage)

20 month old child child is trying to get rice onto a spoon
Mother places her knife behind the rice and puts the rice onto the spoon (EN)

24 month old child mother is fixing lunch
Child is sitting at table
Mother: why don't you make a picture? (ENC)

3. Mon (Monitor)

12 month old child mother has been spoon feeding the child
Mother stops, waits and watches for some indication that the child is ready for more food (MON)

4. PR/MF+

20 month old child child has been self feeding
Mother takes spoon from child's hand and commences spoon feeding
Child cries, mother says "sorry" and returns spoon to child
(PR/MF+)

5. PRMF-

16 month old

child is upset at having food on hands approaches mother to get cleaned

Mother ignores child and reads book

Childs cries get louder

Mother: "for god's sake"

Dimension 3: Responsiveness

Definition of Dimension

- Where parent and child are responsive to each other, act in a reciprocal way, have fun together and share each others world. Parent or child may make a cognitive elaboration to the others current focus of interest – a process called “meshing.” The expression of affect is noted via maternal behaviour, verbal expression, tone, or physical action.

Definition of Codes

APP (Approval)

- Parent expresses verbal approval of the child or the child’s behaviour.

MF+ (Mother Follow Positive)

- Used when the parent responds in a sensitive way to the child’s independent activity or behaviour

PA (Positive Affect)

- Used to record instances wherein the parent is shown to respond with positive affection to the child.
- Can include parents laugh and smile, maternal affectionate touch, joint cuddling, mutual affect, positive time.

LNKS (Links)

- Used when the parent or child expands the activity or topic they are mutually engaged in.
- The parent expands the child’s or their own activity in such a way as to enlarge the child’s understanding.

NA (Negative Affect)

- Used to record instances wherein the parent is shown to respond with negative affection to the child.

- Includes use of negative tone, fierce gestures to child, smacking, aggression, parental teasing of child, hostility, and discordant affect.

CR (Criticism)

- Parental statements that directly criticise the child by tone or content imply inadequacy on his part.
- Displeasure may be conveyed by sarcasm, imitation, exasperation, name calling, blaming, belittling or rejecting the child.

Examples on Coding Dimensions of Responsiveness

1. APP

all ages
 That's right, that's it
 Thank you; Ta
 Clever Boy/ Girl
 Good Girl/ Boy

2. MF+

16 month old
 child pushes spoon off table
 Mother retrieves and places on table (MF+)
 Child pushes spoon off again
 Mother: I guess you don't want that spoon (MF+)

3. PA

all ages
 laughing and smiling
 Mother strokes child's hair while feeding
 Mother and child smile at each other as the last spoonful of food is eaten
 Warm tone attached to any utterance

4. LNKS

24 month old

child is playing with toast

Child says "it's a horse"

Child eats toast

Mother says: the horse is going down into your belly

12 month old

mother is feeding child

Child eats

Child feed the toy rabbit that is sitting on the table

Mother: the rabbit says yum yum.

5. NA

14 month old

child spills juice

Mother responds: that's silly

10 month old

knocks food off highchair

Mother: you're not watching what you are doing. Why are you so messy?

24 month old

child is hungry

Mother holds different packets of biscuits up from tin for him to see

Every time he nods eagerly to have one, she puts the packet away.

18 month old

child approaches mother with bowl of food to be fed

Mother pushes child aside

24 month old

child approaches mother with food on clothing

Mother states "get away"

6. CR

12 month old

child spits food out

Mother: you're a horrible, naughty child

Dimension 4: Cooperation

Definition of Dimension

- Where the parent and child are each compliant to the other.
- The parent finds a positive way to influence the child's behaviour and gain the child's cooperation.
- Negative cooperation occurs when parent utilises forced compliance and threats to achieve cooperation.

Definition of Codes

SC (Seeks Cooperation)

- Mother tries to alter the child's behaviour by polite request, distraction, persuasion, low level direction, or suggestion.

THR (Threat)

- Where parent uses threatening behaviour to the child

FC (Forced Compliance)

- Where mother ensures compliance

Examples of coding in Cooperation dimension

1. SC

16 month old mother places food in front of child
Mother: you do it; eat it all up

24 month old child is wanting to get out high chair to play with toys
Mother: one more spoonful then you can play

2. THR

All Ages Shaking fist
Raising hand
Mother: If you don't stop playing with your food I'll smack you

Mother: If you don't stop crying I'll smack you
If you don't eat all your dinner I'm going to leave you all on your
own

3. FC

24 month old

mother: come and finish your lunch

Child continues to watch TV

Mother picks child up and puts him in chair at table

Child starts to eat then stops again

Mother takes spoon and forces into child's mouth

Child eats

Dimension 5: Distress

Definition of Dimension

- When parent offers comfort and support to a crying child, distress-mother-follow-positive is coded.
- If parent precipitates the distress or fails to support, distress-mother-follows-negative is coded.

Definition of Codes

DISMF+

- When parent responds positively to child's distress either verbally or by doing something to alleviate the distress

DISMF-

- To be used when parent's behaviour causes the child's distress by physically poor handling or emotional insensitivity or when parent ignores child's distress or is nasty to the child about the distress.

Examples of coding in Distress dimension

1. DISMF+

16 month old child is in high chair after main meal has been eaten
Mother leaves the room and child amuses himself happily with toys for a time. He then looks around and gets into a cross, vocal state.
Mother shouts "I'm getting you a banana"

2. DISMF-

24 month old child has been playing with food
Mother takes plate away
Child cries
Mother goes on with cleaning up

Dimension 6: Control

Definition of Dimension

Control is a measure of the parent's intention to achieve compliance from the child regardless of the child's agenda.

- Each control sequence is coded independently with the control issue being considered for legitimacy and appropriateness for the parent to be pursuing.
- The content of the argument is noted and whether the control issue was nicely and effectively handled, or not, is recorded.
- How the control sequence ended is also noted as is the interaction which followed its conclusion.

Example of coding in Control Dimension

CONT

18 month old mother persists in attempting to spoon feed despite child's obvious upset and distress.

Appendix 3.3

Coding Sheets

LEARNING TO OBSERVE CODING SHEETS

DIMENSIONS

Subject

Date

Involvement: 0 = minimum involvement 1 = well engaged

MINUTES	INV	INTERACTION	CONTROL NUMBER		
			L	H	E
0 - 9					
10 - 19					
20 - 29					
30 - 39					
40 - 49					
50 - 59					

Involvement: 0 = minimum involvement 1 = well engaged

MINUTES	INV	INTERACTION	CONTROL NUMBER		
			L	H	E
0 - 9					
10 - 19					
20 - 29					
30 - 39					
40 - 49					
50 - 59					

Appendix 3.4

Coding Summary Sheet

MOTHER'S NAME	LEARNING TO OBSERVE	DATE
----------------------	----------------------------	-------------

POSITIVE	+	-	NEGATIVE
<u>Anticipation</u> Facilitate before caretake			<u>Anticipation</u> Lapsed
<u>Autonomy</u> Check Monitor Encourage Enable Protest-mother follow			<u>Autonomy</u> Protest-mother ignore Protest-mother negative Inappropriate developmental level Poor timing
<u>Responsiveness</u> Positive Affect Approve Mother follow Positive			<u>Responsiveness</u> Negative affect Criticism
Mother Link –Child Follows			
<u>Co-operation</u> Seeks Cooperation			<u>Co-operation</u> Threat Forced Compliance
<u>Distress</u> Mother follow Positive			<u>Distress</u> Mother follow Negative

Control

ISSUE	POSITIVE	LEGITIMATE?	HANDLING?	ENDING?	NEGATIVE



Gateshead and South Tyneside Local Research Ethics Committee
Room 148
TEDCO Business Centre
Rolling Mill Road
Jarrow
Tyne & Wear
NE32 3DT

Tel: (0191) 4283418
Fax: (0191) 4283618
carole.moore@nhs.net

Ms Charlotte Wright
Paed Unit, 8th Floor
QMH Tower
Yorkhill Hospitals
Glasgow
G3 8SJ

Dear Ms Wright

Study title: *Case control study of mealtime feeding behaviour in children who fall to thrive*
REC reference: *146/99*

Amendment number: *1*
Amendment date: *14 July 2005*

Thank you for submitting the above protocol amendment, which was received on 11 August 2005. It is noted that this is a modification of an amendment previously rejected by the Committee (our letter of 3 August 2005 refers).

The modified amendment has been considered on behalf of the Committee by the Chair, Dr Alex Hendrick.

Ethical opinion

I am pleased to confirm that the Chair, on behalf of the Committee, has given a favourable ethical opinion of the modified amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved are:

<i>Notice of substantial amendment form (modified)</i>	<i>dated 08/08/2005</i>
<i>Notice of substantial amendment form</i>	<i>dated 15/07/2005</i>
<i>Covering letter</i>	<i>dated 15/07/2005</i>
<i>Gateshead LREC letter</i>	<i>dated 20/04/2000</i>
<i>Letter to Gateshead LREC</i>	<i>dated 20/03/2000</i>
<i>Article from JCPP</i>	<i>dated 2004</i>
<i>Information sheet</i>	<i>undated, no version number</i>
<i>Consent Form</i>	<i>undated, no version number</i>
<i>Article from CAR</i>	<i>dated 1994</i>

Management approval

All investigators and research collaborators in the NHS should notify the R&D Department for the relevant NHS care organisation of this amendment and check whether it affects local management approval of the research.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

[REC reference number]: 146/99	Please quote this number on all correspondence
--------------------------------	--

Yours sincerely,



Mrs Carole Moore
REC Co-ordinator

E-mail: carole.moore@nhs.net