



National Biomedical  
Research Unit in  
**Hearing**

# Maternal Sensitivity and its role in early communication in children who are deaf

Deborah James



## Team

- Dr Meg Wadnerkar
- Rachel Haines Bazrafshan
- Luke Collins
- Claire Falck
- Dr Anna Telling
- Christa Lam (July '10)



National Biomedical  
Research Unit in  
**Hearing**

*creating new knowledge to alleviate the burden of  
disability for hearing related problems*



The University of  
**Nottingham**



*National Institute for  
Health Research*



## Child and Family

N-of-1 randomised controlled trial (treat now, & treat later conditions)  
Nottingham City and County, partners in health, education and Ear Foundation

### **Intervention Science:**

**Early intervention**

**Maternal well-being**

**Empowerment and active engagement of families**

**Inclusive intervention design**

### **Disability associated with deafness:**

Early communication – parental anxiety, early assessments

Family in focus - an adaptive unit and its relationships (endogenous and exogenous) are critical for child health & development



## Mental Health Services

Implementing new intervention to enable families to be active partners in their own health services



## Cochlear Implantation and Early Assessment

Developing clinical assessments of family and child factors that help NHS to create patient need's led pathway for cochlear implantation with Nottingham Cochlear Implant Programme



## Translating Basic Science into Potential Benefit for Society

New synthesis of psychological science, speech science, linguistic science, organisational science.

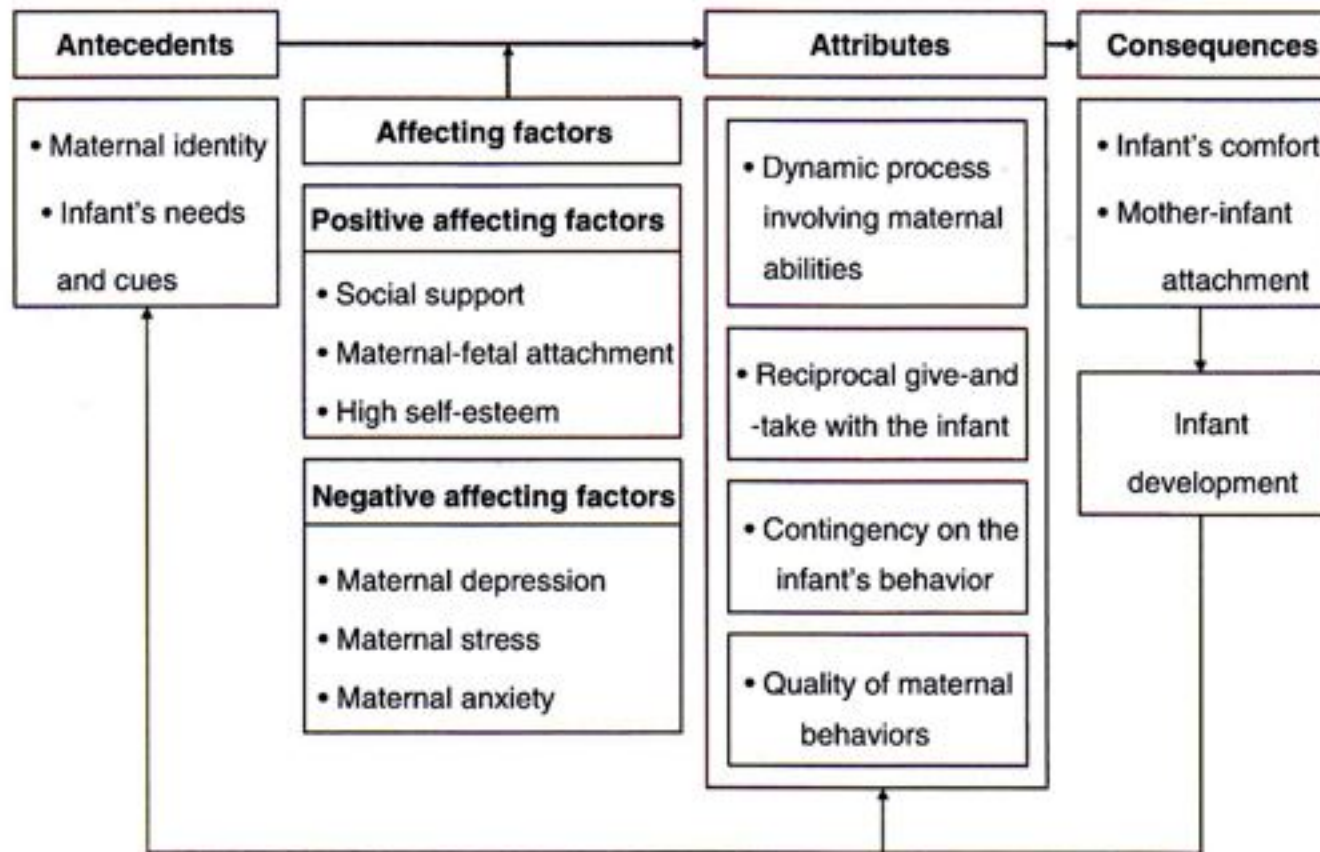
What does it mean to empower parents to be active partners in health services?

What is an empowering clinical encounter? How can we develop new roles and new ways of working within organisational structures to support the implementation of effective novel interventions? What impact do empowering health services have on parental well-being and child outcomes?

Developing new methodological capacity in NBRUH in behavioural, neuroscience and geobioscience to test social constructivist theory of early child development



# Maternal Sensitivity (Shin et al 2008)



**Building Relationships to Enable the Child to Flourish**

## **Continuity – sounds, speech-like, speech**

- Opening and closing of mouth, rhythmic movements, smooth voicing – ‘feels like speech’ to lay people
- Phonation (0-2 months) with quasi vowels – normal phonation
- Primitive Articulation Stage (1 – 4 months) gooing - artic. attempt
- Expansion Stage (3-8 months) full vowels/babble – full resonance
- Canonical Stage (5-10 months) canonical babble – well timed artic.
- Infants develop their own contrastive systems early on (vowels, screams and growls, yells, whispers) – how does meaning

**Building Relationships to Enable the Child to Flourish**

# Social Construction of Speech

- Goldstein et al (2003)  
**contingent** behaviour of the mother (eye-gaze/smiling) produced advanced vocal behaviour in the infant, same behaviour (smiling/eyegaze), but not contingent on child's vocal behaviour produced no changes in vocal expression of child.
- Gros-Louis, West Goldstein & King (2006)  
In natural play mothers responses are yoked to nature of infant's utterances (vowels – play from mother, CV – imitation from mother)
- Goldstein et al (2008) contingency of rhythmic behaviour

counts  
**Building Relationships to Enable the Child to Flourish**



# The Study

- Single centre exploratory pilot study of an intervention
- Single cases (families) – duration of 16 months
- Random allocation to intervention or waiting list group
- Maternal sensitivity builds early vocal development in children who are deaf/Deaf/hard of hearing
- Emotional availability, self-esteem, Tait analysis, Stark's vocal profile, Mullen's scale of early development, Vineland, parent interviews, parent's evaluation of the intervention, fidelity of the intervention (mother's responses during intervention), Family empowerment questionnaire,
- Families where child is pre-linguistic (<20 words in lexicon)

**Building Relationships to Enable the Child to Flourish**

## Study Design - between group comparison and within family comparison



**Building Relationships to Enable the Child to Flourish**

## **Evaluating Social Theory for Early Speech Development in Children with Hearing Impairment**

### ***Prediction***

That maternal sensitivity and the associated contingent behaviour in the mother will have an impact on the vocal development of the child.

The objective behavioural measure of maternal sensitivity is contingency in the mother (the response of the mother to the child's vocal or speech like behaviour).

Multi-state process transition models – analysis of transition between states (mother/child dyads, fx of mother's contingent vocal behaviour)

No association between mother's contingent behaviours in the waiting list mothers (over the same time-lag), but a positive association between these aspects in the same mothers in their pre-post intervention assessment.

**Building Relationships to Enable the Child to Flourish**

Null predictions.

***Mothers' contingent behaviour could be influenced by the vocal/communicative/IQ of the child.***

The vocal/pre-verbal/IQ level of the child at the start of the study will not predict the contingent behaviour of the mother.

Contingency in mother's vocal behaviour will be a stronger predictor of child's vocal development than child's pre-verbal skills.

***Child's vocal development could be influenced by the general vocal behaviour of the mother in IDS.***

Contingency in the mother's vocal behaviour will predict vocal development in the child. Fx of

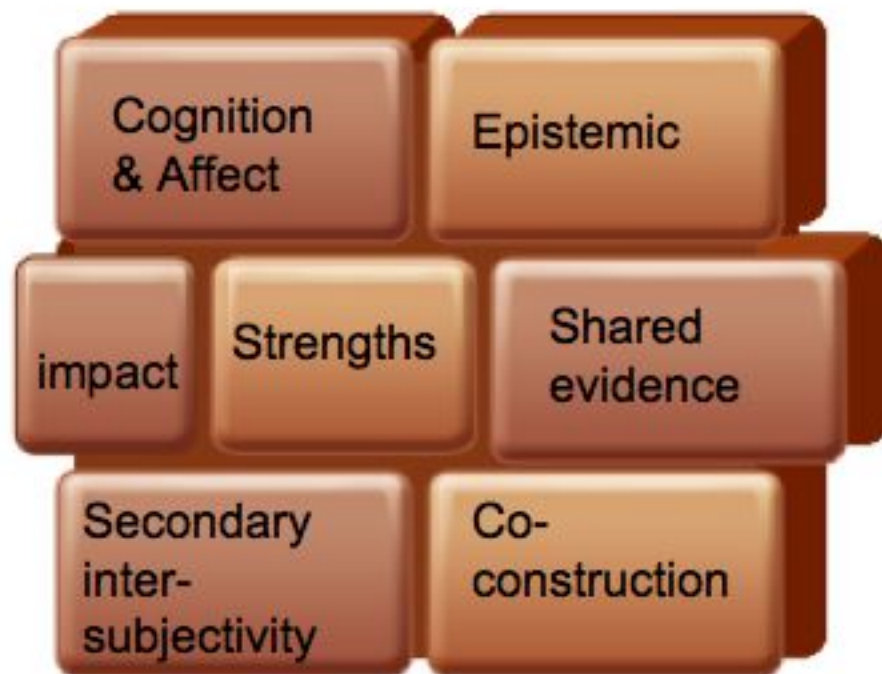
***IDS modulates child's arousal level – does the mother help the infant set the parameters for their own widely varying vocalisations?***

***How does the mother attune to the infant's variability in production of early speech?***

**Building Relationships to Enable the Child to Flourish**

# Video Interaction Guidance

Transformational Learning – a tool for change



**Building Relationships to Enable the Child to Flourish**

# VIG Evidence Base

- 20 years of practice (UK and Netherlands)
- Used with families
- 2008 – first meta analysis of the approach (Fukkink, 2008)
- Included 29 studies that used VIG methodology (1844 families)
- Effects on 3 levels:
  - Parent Behaviour 0.47 (moderate)
  - Parent Attitude 0.37 (moderate)
  - Child Behaviour 0.33 (moderate)
- Shorter courses are more effective than longer ones
- 4 sessions produce 'real' change

**Building Relationships to Enable the Child to Flourish**

Photo and video clip of family removed for web storage

**Building Relationships to Enable the Child to Flourish**

Photo and video clip of family removed for  
web storage

**Building Relationships to Enable the Child to Flourish**



# Parent Voice

Jacqueline Bristow –Brighton and Hove NHSP 2002 – 2007

*She can communicate with her eyes, her hands, her face – not like I thought. She uses her mouth sometimes, also other senses. Now there is hope.*

*I can see in the tape she can turn, follow with her eyes, she can give reactions with her face, she can grip. She is not worse like I thought. I can see the reactions from her face.*

*The videos show me she can say “no I don’t want to”. I can hear it, it happens without us knowing. At the end of the day I can feel we’ve been chatting all day, not one word said. I really do feel that.*

**Building Relationships to Enable the Child to Flourish**

# Empowerment in Action revealed in the Discourse

Active involvement of patients/families has impact on outcome  
of interventions

Agency = propositions

Evidencing the propositions

Subjective attitude towards the propositions – modality

Adults learn using a binary distinction and mediation model?

Construction of thought revealed in 4 phases?

consideration, confirmation, reiteration and assimilation

**Building Relationships to Enable the Child to Flourish**

## *Understanding through binary*



“the educational point is not to teach binary concepts, nor to teach that the world is structured in binary terms, but always to lead towards mediation, elaboration, and conscious recognition of the initial structuring concepts. Some initial grasp is required, however, or there is nothing secure to elaborate, and binary structures are one kind of effective grasper of new meaning”



[www.hearing.nihr.ac.uk](http://www.hearing.nihr.ac.uk) and follow our progress in pictures on the website!

**Building Relationships to Enable the Child to Flourish**