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**MOTHERS AND INFANTS;  
EARLY INTERACTION AND CONSEQUENCES**

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1979**

ABSTRACTMOTHERS AND INFANTS : EARLY INTERACTIONS  
AND CONSEQUENCES

A prospective study was designed to investigate Bowlby's (1958, 1969) theory that the development of the affectional bond between mother and infant - generally termed "attachment" - is the result of certain species-specific stimuli being prepotent as elicitors of instinctual responses in mothers and infants, and to contrast this approach with a reformulation by the author which attempts to include recent evidence pertaining to the receptor capabilities of neonates. In brief the author's formulation is that because of an evolutionary process the human infant discriminates certain visual and auditory stimulus dimensions more readily, these stimulus dimensions being particularly well represented by the caretaker's face and voice and thus once orientated to these stimulus sources selective attention will occur at a high rate. Initial orientation is seen as the result of the caretaker's proximity occurring because of response to infant signals and nutritional requirements.

To test the appropriateness of the two approaches thirty primiparous women between the ages of 20 and 32 were obtained at Nelson Hospital, Nelson, New Zealand,

during the first week after having given birth to a healthy infant, the group being subjected to a 17 minute film designed to teach the mothers to emit certain behaviours. These behaviours were selected as those which would provide either the infant with stimuli Bowlby (1958, 1969) suggests will elicit instinctive responses (mother's face, voice and ventral surface) or the mother with stimuli which elicit instinctive responding (infant crying, smiling and vocalizing). A second group of thirty mothers matched with the first on a number of relevant variables acted as a control group. Specific hypotheses were made which would enable the attachment relationship of the two groups to be compared, and differentiation between the two formulations to be made.

The experimental manipulation was successful in producing desired infant and mother behaviours, the outcome in terms of the quality of interaction of mother and infant, and infant and stranger clearly favouring the experimental group. Specifically the mothers and infants of the experimental group engaged in more reciprocal interaction in which each was responding in a manner complementary to that of the other, such interaction beginning early during the observation, being unbroken and relatively enduring. The mutual orientation of mother and infant which brought this about was the result of infant response to the mother's presenting of her smiling, moving, talking face within the infant's visual field, this stimulus

complex rather than maternal responses to signals from the infant operating. While maternal response to signals was not a significant factor in relation to maternal orientation to the infant, none-the-less it was the mother who initiated and maintained the continuing exchange and thus maternal or infant variables other than those measured must have been responsible for maintaining maternal responding.

The infants in the experimental group were initially significantly more sociable to a male stranger, but by six months of age this positive response had changed to marked negative reaction for most of the infants, with some even having passed through this stage. This was in contrast to the control group whose responsiveness to the stranger was minimal at both three and six months and only rarely negative, none of the infants having passed through the stage of negative reactions to strangers.

The appropriateness of current models of the attachment relationship in describing attachment was tested. All were able to describe the relationship of mother and infant in a manner which differentiated the two groups, this result being considered to give evidence of their basic similarity.

The results were found to support the author's reformulation that the mother's face and voice have special stimulus characteristics in attracting high rates of attention from the infant, the resulting

mutual orientation of mother and infant giving rise to attachment interaction. Thus the mother's face and voice and infant orientation towards them can be described as "precursors of attachment". Support for the mother's face, voice and ventral surface as elicitors of instinctive responses from the infant and infant signals eliciting instinctive responses from the mother was not forthcoming.

PREFACE

This study is an investigation of the developing relationship between mothers and infants. Much of the literature in this area has owed its origins to the now classic formulation of Bowlby (1958, 1969) who considered that the relationship between a mother and her child comes about through the dynamic interaction of certain environmentally stable behaviour systems. Bowlby (1958) postulated that the positive aspect of the child's tie to its mother is expressed through a number of species-specific innate behaviours, namely, sucking, clinging, following, crying and smiling, and that these component responses become integrated in the first year in to what he termed "attachment behaviour". In the absence of ability to locomote visual tracking is seen as serving the following component. In the case of sucking, clinging and following, the infant is the principal active partner, and crying and smiling serve to activate (in the ethological sense of a "releasing mechanism") maternal behaviour. In his 1969 paper Bowlby included four more behaviours (rooting, postural adjustment, listening and vocalizing) and gave emphasis to the incorporation of these behaviours in to a behavioural system which operates on a "feedback principle" whereby mother and infant maintain proximity to each other.

While there is indirect evidence for the importance of the eight behaviours to be active in maintaining interaction between mother and infant, such evidence

has tended to portray a system of greater complexity than would be predicted from a system based on innate, species-specific behaviours, and as yet the basic premise that "attachment" is based on a set of species-specific behaviours has not been tested directly. Instead studies have tended to be involved with the measurement of some aspect of attachment as defined by Bowlby (1969).

Accordingly a controlled prospective study was undertaken in which an attempt would be made to manipulate the infant's emitting of those behaviours Bowlby (1958, 1969) considers are species-specific and which serve to "...contribute to the reciprocal dynamic of binding mother to child" (Bowlby, 1958,p.351) and to measure the outcome of such a manipulation. Because it is not possible on practical and/or ethical grounds to manipulate directly the infant's emitting of the behaviours chosen, this was effected by teaching the mothers behaviour which the literature suggests would provide appropriate conditions for the species-specific infant behaviours to be manifest at a high rate. Postural adjustment was not included in the final group of behaviours chosen for possible manipulation because of the difficulty in influencing its occurrence, neither were sucking and rooting, again because of difficulty in influencing their occurrence and lack of evidence for their having an important role (Ainsworth, 1973). The final choice of infant behaviour to be investigated was looking, listening, clinging, smiling, vocalizing and crying.

As well as an evaluation of Bowlby's (1958, 1969) theory a reformulation was put forward by the writer which would take in to account recent findings that show the visual and auditory systems of the human infant to be sensitive particularly to a range of stimuli which are characteristic of those represented by a moving, talking human face, i.e., moving, contoured, symmetrical, complex visual stimuli, and low frequency wide-band sound. The writer in his reformulation suggests that through an evolutionary process a "fine-tuning" of the infant's auditory and visual systems has occurred, leading to their particular receptive characteristics. Caretaker response to infant signals (crying) and nutritional requirements serve to bring mother and infant in to close proximity where the infant is most likely to receive stimulation to which it is maximally sensitive, and hence high rates of attention to the mother's face and voice will occur. The result of this attending is that the mother will become readily discriminated and serve as a potent reinforcing medium and thus ensure that the infant's behaviour is elaborated in a social direction.

To measure the effectiveness of the experimental manipulation, its outcome in terms of enhancing the attachment relationship, and the appropriateness of Bowlby's (1958, 1969) and the writer's formulation in describing the relationship, specific experimental hypotheses were made against which the null hypothesis could be tested, i.e., there will be no differences in

the behaviour of mothers in the experimental group attributable to their viewing of the training film, there will be no differences between the experimental and control group mothers on any measures of their attachment relationship, there will be no differences in the behaviour which the infants in the two groups display towards a stranger, and infant looking at, listening to and clinging to the mother, and maternal response to infant cries, smiles and vocalizations will not predict the attachment relationship.

Throughout the chapters which follow the term "attachment" and "attachment behaviours" are used to conform with the definition laid down in a discussion by a proponent of the ethological approach and her colleague, namely Ainsworth and Bell (1970). They define an attachment as .... "an affectional tie that one person or animal forms between himself and another specific one - a tie that binds them together in space and endures over time. The behavioural hallmark of attachment is seeking to gain and to maintain a certain degree of proximity to the object of attachment, which ranges from close physical contact under some circumstances to interaction or communication across some distance under other circumstances". Attachment behaviours "...promote proximity or contact. In the human infant these include active proximity - and contact - seeking behaviours such as approaching, following, and clinging, and signalling behaviours such as smiling, crying, and calling".

Because the content of this study requires the frequent use of the word "mother" it has been used interchangeably with "caretaker" and "caregiver", similarly both "baby" and "infant" refer to a child of less than approximately one year of age.

The dissertation has been organised in the following way. First a discussion of the major theories of the development of attachment will be presented, followed by a description of behaviours which have been considered by many writers to be "precursors" of attachment and a review of studies relating to those behaviours. In the light of these studies Bowlby's (1958, 1969) theory will be discussed and the alternative reformulation of the writer presented. Research relating to the methodology employed in studies of attachment behaviours and the validity of describing these as attachment behaviours will be reviewed, followed by a precis of current approaches to the conceptualization of attachment per se and the possibility of there being a "critical period" during which a mother and infant are maximally responsive to specific stimuli which mediate attachment. The aims of the study together with a consideration of certain control variables will be given to highlight the need for experimental control to be exercised with respect to those variables. The results are then presented and from these conclusions will be drawn as to the effectiveness of the manipulation in bringing about changes in the relationship of the mothers and infants

subjected to the manipulation, and the appropriateness of the two models (Bowlby's (1958, 1969) and the writer's) discussed.

### ACKNOWLEDGEMENTS

My sincere thanks are given to Professor George Shouksmith and Dr. Bill Quigley for making it possible for this study to be conducted. The pleasant stimulating environment of the Psychology Department at Massey University was greatly appreciated.

Gratitude is expressed to Deidre and Nathan for their invaluable assistance in the making of the film, and to the mothers and infants who took part in the study.

The kind permission of Mr D.W. Low, Medical Superintendent-in-Chief, Nelson Hospital, in granting access to patients is acknowledged, and the continual cooperation of the obstetricians, Charge Nurse and staff of Ward 6, Nelson Hospital, is also appreciated.

In particular thanks are due to the generous grants from the National Childrens' Health Research Foundation and the Mental Health Foundation of New Zealand. Their financial support and confidence in the project provided enormous encouragement.

Finally I must thank my wife Lyn for her unfailing faith that the project would be completed and for her meticulous typing and retyping of the script. My thanks also go to Mrs Cheryl Robertson who helped with the typing.

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