

**A COMPARISON OF DEPRESSED AND NON-DEPRESSED MOTHERS'
SPEECH TO TWO-MONTH OLD INFANTS IN A SOUTH AFRICAN
PERI-URBAN SETTLEMENT**

A thesis submitted in partial fulfilment of the
requirements for the degree of

MASTER OF SOCIAL SCIENCE (Clinical Psychology)

Rhodes University

by

GILLIAN JULIE GULLE

SUPERVISOR: DR CHARLES MALCOLM

SUBMITTED: MARCH 2002

ACKNOWLEDGEMENTS

I would like to thank the following people for providing me with the secure-base from which I have been able to explore my world:

Hennie, Gill, Brian, Tracey, Derek, Shan, Tanya, Donny, Eamon, Mignon & Terri.

Your support has played an essential role in my development. Thank-you.

Thank-you also, to Charles, Mark and Peter for their guidance.

ABSTRACT

Research shows that maternal depression has adverse effects on mother-infant attachment and subsequent infant development (Cogill, Caplan, Alexandra, Robson & Kumar, 1986). The mechanisms through which this comes about are unclear. Murray & Cooper (1997) suggest an impaired pattern of mother-infant communication is responsible. Within this, Murray proposes that maternal speech may be a key factor. This study constitutes a preliminary exploration into the mechanisms through which maternal depression effects mother-infant interaction in South Africa. 147 predominantly Xhosa-speaking mother-infant dyads that took part in a broader epidemiological study on post-partum depression in Khayelitsha (Cooper, Tomlinson, Swartz, Woolgar, Murray & Molteno, 1999) made up the subjects. Maternal depression was assessed according to the Structured Clinical Interview for DSMIV (SCID). Maternal speech recorded from standard, five-minute, face-to-face mother-infant interactions was translated and analysed according to a coding system developed by Murray (Murray, Kempton, Woolgar & Hooper, 1993). The speech of depressed mothers to their two-month old infants was compared to the speech of non-depressed mothers on dimensions of focus, affect and agency, and the role of infant gender was assessed. Results revealed no significant group differences for depression. Maternal speech to male infants was found to hold significantly less ascription of agency than to female infants. Findings suggest that maternal speech may be too narrow a marker of maternal depression in this context and that broader indices are needed. It is recommended that future research control for measures of social adversity, factor in cultural and language particularities, and consider contextual aspects of mother-infant interaction / attachment processes, in investigating the mechanisms through which post-partum depression leads to negative infant outcome in the developing world.

TABLE OF CONTENTS

	<u>PAGES</u>
ACKNOWLEDGEMENTS	i
ABSTRACT	ii
TABLE OF CONTENTS	iii
LIST OF APPENDICES	vi
LIST OF TABLES	vii
CHAPTER ONE - INTRODUCTION	1
1.1 The Birth and Development of Attachment Theory	1
1.2 The Depressed Mother	4
1.2.1 Post-Partum Depression	5
1.2.2 The Effects of Post-Partum Depression on Infant Development	6
1.2.3 A Comment on Methodological Limitations	7
1.2.4 Post-Partum Depression in the Developing World	8
1.3 Communication as a Critical Variable	10
1.4 Verbal Communication: Maternal Speech	13
1.5 A Curious Variable: The Role of Infant Gender?	16
1.6 The South African Context	17
1.7 The Broader Research Project	18
1.8 Aims of the Current Study	20

CHAPTER TWO - METHODOLOGY	22
2.1 Subjects	22
2.2 Method	24
CHAPTER THREE - RESULTS	27
3.1 Inter-Rater Reliability	27
3.2 Missing Data	27
3.3 Characteristics of Maternal Speech	28
3.4 Descriptive Statistics	29
3.5 Comparison of Depressed and Non-Depressed Mothers' Speech	29
3.6 Infant Gender and Maternal Speech	31
3.7 Suggestions for Future Data Analysis	32
CHAPTER FOUR - DISCUSSION	34
4.1 Context for Interpretation	34
4.2 The Results Interpreted	34
4.3 Methodological Critique	37
4.4 A Comment on Infant Gender	40
4.5 Conclusion	41
CHAPTER FIVE - CONCLUSIONS & RECOMMENDATIONS	42

REFERENCES 43

APPENDICES 64

LIST OF APPENDICES

	<u>PAGES</u>
Appendix I	Post-Partum Depression as Defined by the Diagnostic and Statistical Manual IV-TR (American Psychiatric Association, 2000) 64
Appendix II	Photographic Examples of Total Patterns of Body Expression in Infants – Patterns That Appear Similar to Dance (Trevarthen, 1979) 66
Appendix III	Photographic Examples of Adult Facial Expression Found in Video Recordings of Infants and Newborns (Trevarthen, 1979)67

LIST OF TABLES

	<u>PAGES</u>
Table 1	Sample Characteristics 22
Table 2	Maternal Depression & Maternal Speech – Comparison of Group Means 30
Table 3	Infant Gender & Maternal Speech – Comparison of Group Means 31

CHAPTER ONE - INTRODUCTION

The following introduction aims to provide a context for understanding the research that is the subject of this dissertation: the effects of maternal depression on mother-infant interaction and infant development in the developing world. It also attempts to demonstrate the rationale for undertaking the present study at this point in time and in this particular manner. The paper begins with a background on attachment theory and then focuses in on maternal depression (post-partum depression). Following this, communication is highlighted as a central issue, and within that, verbal communication (maternal speech) is isolated as a variable worth further exploration. The role of infant gender is discussed. The relevance of the above issues for the South African context is addressed and finally the specific aims of the investigation are made explicit.

1.1 The Birth and Development of Attachment Theory:

Historically, attachment theory was born in the 1940's, rooted in the work of John Bowlby, and then further pioneered by Mary Ainsworth. It was Bowlby's ability to survive the disruption of his ambivalent attachment to the traditional psychoanalytic ideas of Freud, Anna Freud and Melanie Klein, which gave birth to attachment theory (Holmes, 1995). Bowlby became intent on establishing an account of infancy and childhood that was interpersonal rather than intrapsychic, that was grounded in experimental evidence rather than speculation. He reconceptualised the 'unconscious' as containing a representation of the interpersonal world, as opposed to being a hypothetical cauldron of fantasy (Holmes, 1995).

The basic tenets of Bowlby's attachment theory point to the primary importance of the initial mother-infant bond as the archetype for all subsequent relationships ¹ (Bowlby, 1969). This first attachment, which is hypothesised to provide the child with a secure base from which to explore the world, is put forward as fundamental for subsequent healthy development (Grossmann, 1995). Given Bowlby's bio-medical background, he conceptualised mother-infant attachment as a universal phenomenon. His research focused on the disruption of the 'normal' mother-infant bond as a result of separation, deprivation or bereavement, and the subsequent development of psychopathology (Marrone, 1998). In the early 1950's, Ainsworth, aware of Bowlby's thinking, but as of yet unconvinced of its utility, expanded on the theory using innovative methodology, most notably the Strange Situation Procedure, to test his ideas empirically (Ainsworth, Blehar, Waters & Wall, 1978; Ainsworth & Wittig, 1969; Bretherten, 1995). Her contribution was substantial and her work has become the 'secure base' of psychological thinking in the area. Among her conceptual contributions was her observation that maternal sensitivity plays a key role within mother-infant interactions (Marrone, 1998).

A vast literature has followed Bowlby's and Ainsworth's initial groundwork in the area of attachment, with a particularly impressive explosion since the 1970's. The quality of mother-infant attachment has repeatedly been shown to have far reaching consequences for later development (e.g. Cicchetti, Rogosch & Toth, 1998; Field, 1977; Cummings, 1995; Lyons-Ruth, Connell & Grunebaum, 1990; Lyons-Ruth, Zoll, Connell & Grunebaum, 1986; Martins & Gaffan, 2000; Radke-Yarrow, Cummings, Kuczynski & Chapman, 1985; Seifer, Sameroff, Dickstein, Keitner, Miller, Rasmussen & Hayden, 1996; Sprangler, Fremmer-

¹ For the purposes of this dissertation the word 'mother' will be used to refer to the primary care giver in an infants life, whom need not necessarily be the biological mother.

Bombik & Grossmann, 1996; Teti, Gelfand, Messinger & Isabella, 1995). Out of the research a detailed map of mother-infant interaction is beginning to emerge. Advances in video and film technology have allowed for meticulous observation and description of mother-infant interactions, where exchanges are examined frame by frame and minutes of engagement are broken down into hours of analysis. Characteristics of these interactions have been reported extensively in the literature (e.g. Brazelton, Tronick, Adamson, Als & Wise, 1975; Murray & Trevarthen, 1986; Stern, 1985; Stern, Beebe, Jaffe, Bennett, 1977; Trevarthen, 1979).

What has become undisputably evident about the nature of these exchanges is that, in addition to being complex, they are marked by mutual regulatory patterns (Beebe, Jaffe, Feldstein, Mays & Alson, 1985; Murray, Stanley, Hooper, King & Fiori-Cowley, 1996; Murray & Trevarthen, 1986; Stern, 1985; Tronick & Gianino, 1986). That is, the interactions are reciprocal in nature, with both the mother and the infant taking on active roles in the process. Mother-infant interactions have been observed to have a 'proto-conversational character', much like adult-to-adult exchanges. Even in extremely young dyads, it is evident that a complex form of mutual understanding develops, which is both naturally accepted and strongly regulated by the infant and mother alike (Murray & Trevarthen, 1986; Murray & Trevarthen 1985). Recent mother-infant research has become increasingly more sophisticated with researchers embarking on detailed analyses of the nuances of interactive affective modulation and mutual regulation, as well as comprehensive patterning and in-depth scrutiny of processes such as the rupture and repair of transactions within mother-infant dyads (Beebe & Lachmann, 1994). The most current advances in attachment theory have been interdisciplinary with researchers postulating links between

neurobiology, affective regulation, the synchronicity of mother-infant interaction, and the quality of attachment (Schore, 2001).

Winnicott (1960) has written about the concept of the 'good-enough' mother, whose function it is to 'hold' and 'mirror' her infant with sufficient consistency as to allow for the development of the 'true self'² &³. He puts forward that the infant's primary environment is the mother herself (Murray, 1988). Indeed, Winnicott (1960) states that early on in life the infant and the maternal care form a unit, that they belong to each other, and that they cannot be disentangled or separated out. If one accepts the notion of the mother-infant dyad being a closed system, as well as one that is mutually regulated, then it follows that any change in maternal status (or infant status) is a potential disruption to the mother-infant bond. Maternal depression is one such variable that can be seen to constitute a change in maternal status.

1.2 The Depressed Mother:

More than 80 years ago in 1921, Kraepelin first noted the risks to children reared by depressed parents (Kraepelin, 1921). Modern inquiry into these risks began with the landmark study by Rutter (1966), and research in the past three decades has largely confirmed the notion that when a mother is depressed, there is a negative impact on her offspring (e.g. Cox, 1986; Cummings & Cicchetti, 1990; Field, 1995; Field, 1992; Rutter & Quinten, 1984; Tronick & Gianino, 1986; Weinberg & Tronick, 1998; Weissman & Paykel, 1974).

² The 'true self' can be understood as the inherited potential of experiencing a continuity of being and acquiring a personal psychic reality, allowing one to feel alive, spontaneous and creative (Winnicott, 1960).

³ Winnicott's descriptions of healthy mother-infant relations in the first few months of 'mirroring' and 'holding' are similar to the notion of 'responsive' and 'accepting' mothering put forward by Ainsworth for older mother-infant pairs (Murray & Trevarthen, 1986).

1.2.1 Post-Partum Depression:

For the purposes of this dissertation post-partum depression will be defined in accordance with the symptom classification of depression in the Diagnostic and Statistical Manual IV-TR⁴, where it is listed as a specifier (American Psychiatric Association, 2000). Research has consistently placed the prevalence of post-partum depression at between 10-14 % (e.g. Cox, Connor & Kendell, 1982; Cox, Murray & Chapman, 1993; Kumar & Robson, 1984; O'Hara & Zekoski, 1988). Work in the area has identified a plethora of risk factors potentially contributing towards its aetiology. They span individual, familial, social and environmental issues (Cummings & Cicchetti, 1990), and include a previous history of psycho-pathology or depression (Dean & Kendell, 1981; O'Hara & Swain, 1996), stressful life events (O'Hara, 1986), psychological disturbance during pregnancy (O'Hara, Neunaber & Zekoski, 1984), pre-birth anxiety (Hayworth, Little, Bonham Carter, Raptopulos, Priest & Sandler, 1980), obstetric complications (O'Hara, Neunaber & Zekoski, 1984), biological and hormonal factors (O'Hara & Zekoski, 1988), premature birth, unwanted or ambivalence about having the child (Kumar & Robson, 1984), unresolved loss, history of miscarriage (Kumar & Robson, 1984), young age (Paykel, Emms, Fletcher & Rassaby, 1990), low education, low socioeconomic status (Lyons-Ruth, Zoll, Connell & Grunebaum, 1986), environmental or social stressors related to housing and poverty and class (Kumar & Robson, 1984), inadequate social support (Da Costa, Larouche, Drista & Brender, 2000; O'Hara, 1986), marital status and in particular poor marital relations (Cox, 1979), relationship with and role of maternal grandmother (Cox, Connor & Kendell, 1982), mother-infant 'fit' and infant temperament / predisposition / personality (Hammen, Burge & Stansbury, 1990).

⁴ Refer to Appendix I for the list of criterion

1.2.2 The Effects of Post-Partum Depression on Infant Development:

It has been well documented in the literature that post-partum depression has an adverse effect on the development of the mother-infant relationship, and has implications for a child's subsequent development (e.g. Cogill, Caplan, Alexandra, Robson & Kumar, 1986; Cohn, Campbell, Matias & Hopkins, 1990; Cohn, Matias, Tronick, Connell & Lyons-Ruth, 1986; Stein, Gath, Bucher, Bond, Day & Cooper, 1991; Zahn-Waxler, 1995). Longitudinal evidence suggests that post-partum depression is associated with disturbances in the cognitive, social and emotional development of children (Murray & Cooper, 1997; Murray & Cooper, 1996). Some examples of evidence in support of this claim are listed in the paragraph below:

Infants with depressed mothers have been found to be more insecurely attached, perform more poorly on object concept tasks and have more behavioural difficulties at 18-months, than infants with non-depressed mothers (Murray, 1992). Wrate, Rooney, Thomas & Cox (1985) found that three year old children of mothers who had brief post natal depressive episodes showed more behavioural disturbances than those whose mother had not been depressed since childbirth. Galler, Harrison, Ramsey, Forde & Butler (2000) found significant relationships between maternal mood and infant cognitive development, as measured by the Griffiths Mental Development Scales, at three and six months. Jones *et al*, (1997), conducted behavioural assessments at three, six and twelve months and showed that infants of depressed, withdrawn mothers exhibited less optimal behaviour and lower Bayleys Scales of Infant Mental Development scores, at one year, than infants of non-depressed mothers. From their research, Hart, Jones, Field & Lundy (1999) concluded that exposure to

depressed mothers non-optimal interaction styles represents risk to infant cognitive and affective development. Fendrich, Warner & Weissman (1990) showed parental depression and family risk factors to be associated with the development of conduct disorder. Murray, Fiori-Cowley, Hooper & Cooper (1996) found that depressed mothers were less sensitive, less affirming and more negating of infants and that disturbances in early mother-infant interactions were predictive of poorer infant cognitive outcome at 18 months as measured by Bayleys Scales of Infant Mental Development.

1.2.3 A Comment on Methodological Limitations:

As with all social science empirical inquiry, the body of research into the effects of post-partum depression on infant development has been subject to methodological limitations. This potentially affects the validity and reliability of the information being accumulated. Some of these limitations include the following: small sample sizes and the lack of control groups (Paykel, Emms, Fletcher & Rassaby, 1990); definitions of post-partum depression have been inconsistent (Field, 1986; Paykel, Emms, Fletcher & Rassaby, 1990); little use of standardised methods of clinical assessment (Kumar & Robson, 1984); the way in which variables are operationalised and the measurement tools employed have varied considerably (Cooper, Campbell, Day, Kennerly & Bond, 1988); studies have tended to be retrospective, instead of prospective and longitudinal with follow up investigations (Kumar & Robson, 1984; Paykel, Emms, Fletcher & Rassaby, 1990); laboratory settings have been criticised as being artificial environments (Trevarthen, 1979); the timing of studies has varied greatly from between 6-weeks to 18-months post-partum (Paykel, Emms, Fletcher & Rassaby, 1990); the validity of psychiatric assessment tools across communities has been questioned (Myers

et al, 1984); normal changes in pregnancy have been argued to overlap with symptoms of depression (appetite changes, no interest in sex, fatigue, anxiety) thus confounding investigations (O'Hara, Neunaber & Zekoski, 1984); cases have been made for the importance of assessing the severity of depression and not merely the criterion (Campbell, Cohn & Meyers, 1995); there are studies which have failed to report drop out rates (Kumar & Robson, 1984); and others which have failed to distinguish between transient and protracted depression (Campbell, Cohn & Meyers, 1995).

In recent years, researchers have become more conscious of the limitations of the methodology and a more critical and reflective attitude is being adopted which has positive implications for the validity and reliability of the evidence being collected in the field. When one considers the body of knowledge as a whole and then takes into account the methodological issues, one finds that despite the imperfect nature of the inquiry, there is growing support in favour of a significant relationship between maternal depression and negative outcomes for an infants cognitive, social and emotional development (Cooper, Tomlinson, Swartz, Woolgar, Murray & Molteno, 1999). It has been noted that despite the above observations, there is still little clarity on the precise mechanisms by which these developmental problems come about (Murray, Kempton, Woolgar & Hooper, 1993).

1.2.4 Post-Partum Depression in the Developing World:

While post-partum depression has been extensively investigated in the 'developed' world, it has received comparatively little attention in the 'developing' world. Researchers have pointed out that there is a need for epidemiological studies to begin to address the paucity of

research on its prevalence, impact and implications in the 'developing' world (e.g. Cox, Murray & Chapman, 1993; Rahim & Cederblad, 1989). As investigators have begun to take up this challenge many interesting questions are being raised: is post-partum depression a universal phenomenon that transcends culture and socio-economic status? (Cox, 1988; Kleinman & Good, 1985); does it take on the same form as it takes on in western culture? (Cox, 1994; Kumar, 1994); does the notion that western culture has been robbed of ritual have an impact on the phenomenon of maternal depression? (Harris, 1981); do somatic features play a different role in African versus Western populations? (Cox, 1988); can methodology applicable to the 'developed' world be of any use in a 'developing' world context? (Myers *et al*, 1984). As our understanding of maternal depression and culture evolves and deepens, hopefully some of these issues will become clearer.

The following is a synopsis of the recent research on maternal depression in the developing world, aimed at giving the reader a sense of what is being done: a study of Ugandan mothers found that lack of partner support and socio-economic hardships, common in that culture, made mothers vulnerable to post-partum depression (Cox, 1979); an epidemiological study in Indonesia reported poverty to be an enormous risk factor contributing towards maternal depression (Bahar, Henderson & MacKinnon, 1992); research on Nigerian women found stressful life events to be a significant indicator of vulnerability to developing post-partum depression (Aderibrigbe, Gureje & Omigbodun, 1993); studies in Zimbabwe indicate that depression is not as rare as was originally thought and conclude that social stress and in particular the high frequency of severe life events in townships, are key causal factors (Abas & Broadhead, 1997; Abas, Broadhead, Mbape & Khumalo-Sakatukwa, 1994; Broadhead & Abas, 1998; Patel, Simunya & Gwanzura, 1997); research on Portuguese mothers found that

history of depression and negative life events were important predictors of post-partum depression (Areias, Kumar, Barros & Figueiredo, 1996); a study in rural Punjab, confirming a study in northern Pakistan, indicated that there are high levels of emotional distress and psychiatric morbidity among women in rural areas of Pakistan (Mumford *et al*, 1997); research in both Arabia (Ghubash & Abou-Saleh, 1997) and in Dubai (Abou-Saleh & Ghubash, 1997), found prevalence rates of post-partum depression similar to those found in the industrialised world and noted psycho-social risk factors as playing a central role; research on Chinese mothers found that maternal depression was common, against what was originally believed (Lee, Yip, Chiu, Leung & Chung, 2001); in Barbados infants of depressed mothers showed poorer cognitive development than infants of non-depressed mothers (Galler, Harrison, Ramsey, Forde & Butler, 2000); a study in Brazil showed that mothers who had low incomes and less support were at greater risk for depression (Da-Silva, Moraes-Santos, Carvalho, Martins & Teixeira, 1998). The nature of the above findings indicates that the exploration of post-partum depression in the developing world warrants further attention.

1.3 Communication as the Critical Variable:

On the basis of the literature, Murray & Cooper (1997) have postulated that the mechanism that mediates post-partum depression and negative infant outcome, is an impaired pattern of early communication between mother and infant. As discussed earlier in this paper, research has shown that the interaction within the earliest primary attachment bond is complex and multidimensional in nature. Communication between mother and infant is bi-directional, reciprocal and mutually interactive, with all of its physical, verbal and non-verbal nuances.

Trevarthen (1979) argues that an infant has a clear commitment to intentional communication from the earliest stages. Infant observation reflects that an infant utilises its entire body in order to communicate: it alters its body posture, the positioning of its head and neck, and it freely moves its trunk, limbs, feet, hands, fingers and eyes. This has led to the working hypothesis that total patterns of body expression are present in infants, patterns that in fact appear similar to dance⁵. Almost all adult facial expressions can be found in photographs and video recordings of newborns and infants⁶ (Charlesworth & Kreutzer, 1973; Darwin, 1872; Leboyer, 1974). Indeed, cross-cultural evidence points to an innate, pan-human facial 'vocabulary' of emotional signs (Trevarthen, 1979). In addition to facial movements expressing emotionality, infants also show facial movements which have very little to do with mood. In relation to language, the most significant non-emotional expressions are lip and tongue movements. Trevarthen named these speech like movements 'pre-speech' and notes that they exist at birth and then become more distinct in the second and third months of life. The mouth movements are said to evolve from non-linguistic actions like kissing, biting, turning to the breast, pushing out food, vomiting and breathing. When an infant produces 'pre-speech' in systematic relation to the signals from the mother (e.g. smiling and cooing) in face-to-face communication, the infant appears to express a rudimentary intention to speak to her. Infants under one-month old have been shown to mimic and imitate their mother's expressions and match tongue protrusions (Maratos, 1973). By the second month infants can use eye movement to communicate (Robson, 1967; Stern, 1974). They are able to look at what they are interested in and can reject or avoid by looking away (Wolff, 1963). Two-month old infants can initiate and end activity - a capacity essential for reciprocal exchange,

⁵ Refer to Appendix II for photographic examples

⁶ Refer to Appendix III for photographic examples

given that communication is a two-way process (Brazelton, Koslowski & Main 1974). When mothers are unresponsive or aggressive and avoiding, two-month old infants have been shown to exhibit tension and distress by expressions of fear, yawning, frowning, gaze avoidance, crying etc (Trevarthen, 1979). It has been noted that the perception of human sounds is acute in very young infants and speech is reacted to with particular interest (Eisenberg, 1975). All of the above suggests that infants are equipped to perceive and interpret input from their mothers and have the capacity to intentionally respond, thus engaging in mutually regulated communication.

In his work on mother-infant communication, Daniel Stern (1985) has put forward the hypothesis that it is the maternal responses / adaptations seen in interactions at an early stage of infant development, that play a crucial role in establishing a stable and enduring sense of 'core-self'⁷, i.e., a sense of self that is experienced as a coherent, wilful, physical entity with a unique affective life and a history that belongs to it. Stern reports that when a mother responds to her infant's expressive displays of communication she does so along multiple dimensions that are precisely co-ordinated: the speed, intensity, contouring of her head, movements, and so forth, match the patterning of her speech. Stern proposes that when an infant experiences maternal responsiveness in one modality it is already genetically equipped to identify the same form in a second modality, and when that to is presented the infant has primitive forms of 'de ja vu' (Stern, 1985) - the experience that is self-affirming and that gives coherence to infant psychological functioning. In the absence of the continuity of these kinds of experience, as might be the case where the mother is depressed, Stern suggests that the long-term sense of 'core-self' will be weakened (Murray, 1988).

⁷ Stern's concept of the 'core-self' can be compared to Winnicott's notion of the 'true self'

1.4 Verbal Communication: Maternal Speech:

In an attempt to understand the actual mechanisms by which maternal depression gives rise to developmental problems, Murray, Kempton, Woolgar and Hooper (1993) argue that analysing maternal speech to infants could be a useful way to explore maternal interactive behaviour and communication that may be relevant to infant outcome where depression is a factor.

Studies have shown that depression affects verbal communication in a number of ways. For example, it affects the content of speech (Oxman, Rosenberg, Schnurr & Tucker, 1988), the rate of speech (Godfrey & Knight, 1984; Hoffman, Goze & Meudlewicz, 1985; Teasdale, Fogarty & Williams, 1980), and the intonation, pitch and quality of voice (Scherer, 1986). While this research has been done predominantly on verbal communication between adults, there is further evidence that these effects extend to the specialised adaptations of the adult-to-adult speech register termed 'motherese' or 'baby talk', which refers to maternal speech to infants. Bettes (1988) has shown that depression effects the intonation of maternal speech, Radke-Yarrow, Belmont, Nottelman & Bottomly (1990) have shown that it effects the content of maternal speech, and Breznitz & Sherman (1987) have shown that it effects the timing. There is an extensive literature in the general area of motherese (e.g. Beebe, Jaffe, Feldstein, Mays & Alson, 1985; Cazden, 1972; Cross, 1977; Ferguson, 1977; Fernald, 1985; Gleitman, Newport & Gleitman, 1984; Olsen-Fulero, 1982; Papousek, 1989; Papousek & Papousek, 1975; Snow, 1977). In terms of its characteristics, maternal speech to infants has typically been found to be less complicated than adult speech with utterances being shorter and a great deal more repetitive. In addition, the relative salience of different

syntactical structures is distinctive so there are a higher proportion of imperative and interrogative utterances and fewer declarative utterances (Murray, Kempton, Woolgar & Hooper, 1993).

The research on maternal speech to infants has consistently revealed that there are a group of characteristics in mother-infant interactions for which one finds a high degree of mutual responsiveness between mother and infant. Where this responsive engagement is present, motherese has been found to be more 'infant' centred rather than 'mother' or 'other' centred (Cross, 1977; Lieven, 1978). Studies where mothers are shown to be more sensitive, accepting and responsive to their infants, have found that motherese contains fewer directives, imperatives or prompt questions (Nelson, 1973; Snow, 1976), fewer corrections (Cazden, 1972; Lieven, 1978) and more expansions, extensions and genuine questions (Cazden, 1972; Cross, 1977; Lieven, 1978). Murray and Trevarthen (1986) have shown that these characteristics of maternal speech, which distinguish between mother-infant dyads that vary in the degree of harmony and mutual responsiveness, are sensitive to experimental disruptions to the reciprocal nature of mother-infant interactions. Furthermore, Newport, Gleitman & Gleitman (1977) and Olsen & Fulero (1982) have linked the above features of maternal speech to infant progress on measures of language development.

On the basis of this research, Murray *et al* (1993), argue that there is a case to be made for further exploring these aspects of maternal verbal communication to infants as it may well broaden our understanding of exactly how, in the context of depression, adverse infant outcome is brought about. As a means to further explore verbal communication to infants, Murray developed a coding system in order to analyse maternal speech. This coding system,

which is currently in use in Britain, was developed and revised on the basis of extensive literature reviews on speech, language development, motherese, mother-infant communication and ongoing research (Murray, Kempton, Woolgar & Hooper, 1993; Murray & Trevarthen, 1986). In a study investigating the speech of depressed and well mothers', employing this methodology, Murray *et al*, (1993) found that the speech of depressed mothers' was less focused on the infant's experience, held more negative affect, and was less likely to acknowledge infant agency.

Despite the seeming universality of the findings on motherese in the literature, the degree to which they transcend culture, and can be generalised, has not been adequately explored and systematically established. The extent to which speech analysis, and a coding system of this nature, could be usefully employed beyond the context from which it arose is a controversial issue. It is open to debate, for example, whether the methodology would hold any validity and reliability in an environment other than the 'first' world. However, as of yet, there is no existing methodology available to begin to better understand the mechanisms at work in the relatively unexplored context of the 'third' world. Developing valid and reliable, context appropriate tools requires enormous resources, which are both unavailable and unrealistic in the milieu of the developing world. Given this, one could argue that rather than prematurely 'reinventing the wheel', one should use the strongest measures that are available. What is then required is cautious and reflective interpretation of results, with a full awareness of the methodological weakness inherent in this approach.

1.5 A Curious Variable: The Role of Infant Gender?:

In the above study, Murray *et al*, (1993) found that maternal speech of depressed mothers varied according to infant gender. That is, that in the case of male infants the speech of mothers who were depressed was markedly different from the speech of mothers who were well. This was not the case where infants were female. The researchers acknowledge that the reason for this finding is unclear. They speculate that perhaps infant characteristics that vary with gender have a differential impact on depressed and non-depressed women. Indeed, the poorer outcome for males in the context of maternal depression early on in development has been well documented (Rutter & Quinton, 1984), although it is not well understood.

In the literature, male infants are consistently reported as being more irritable and more difficult to soothe than female infants (Moss, 1967; Osofsky & O'Connell, 1977). Research on the normal population has shown that mothers are more responsive to their sons than to their daughters (Tronick & Cohn, 1989). It has been suggested that this is due to a mother's sense of their male infants' vulnerability and potentially difficult behaviour, and from the fact that additional effort may be required to reach the harmonious interactional states achieved with female infants (Malatesta & Haviland, 1982). Murray *et al* (1993), propose that this additional effort may pose problems for depressed mothers and account for their relative failure to focus on their male sons' compared to their daughters' experience. As alternative explanation for the finding it has been suggested that depressed women often have difficult marriages and as such may respond with less empathy to male infants (Murray, 1992). In exploring the role of infant gender, Weinberg, Tronick, Cohn, *et al* (unpublished paper reported in Weinberg & Tronick, 1998) found that at 6-months, male infants of non-

depressed mothers had greater difficulty regulating affective states on their own and needed to rely more on maternal support than girls, to help maintain affective regulation. They also found that mother-son dyads took longer to repair interactive errors than mother-daughter dyads. A hypothesis that has been put forward is that male infants are more demanding social partners than female infants and that depressed mothers have more difficulty providing their sons with the regulatory help that they need. As such a cycle of mutual interactive problems between mothers and sons becomes entrenched (Weinberg & Tronick, 1998). Given that mother-infant communication is bi-directional and mutually regulatory, debates around the role of infant gender pose interesting questions, which warrant further investigation in order to enrich understanding. One such question is whether the above findings on infant gender are cultural bound or universal.

1.6 The South African Context:

South Africa is a developing country that has suffered much socio-economic and political turmoil over the past 30 years. More recently, with the dissolution of apartheid, there have been major structural changes at a foundational level, bringing about further instability. At present, some of the enormous challenges facing South Africa include high levels of unemployment, low levels of education, poverty, rapid urbanisation, insufficient housing, overcrowding, poor resources and access to resources, and an escalating incidence of crime and violence (Hoffman, Pick, Cooper & Myers, 1997; Marks, 1995; Nel & Burgers, 1995; van der Merwe, 1993). Within this climate, the levels of life stress and social adversity reach endemic proportions in parts of the country. Clearly, these conditions are not conducive to promoting the mental health of a nation. If one considers the risk factors potentially

contributing towards the development of post-partum depression⁸, South African mothers in these circumstances appear to be a vulnerable group. Intervention at the level of the depressed mother makes a good deal of sense, in terms of primary prevention for infants, and given that these mothers are more likely during pregnancy and birth, than at any other time, to have access to health resources. However, the extent and nature of post-partum depression in South Africa needs to be explored and better understood before any kind of effective intervention becomes possible.

1.7 The Broader Research Project:

A recent epidemiological study (Cooper, Tomlinson, Swartz, Woolgar, Murray & Molteno, 1999) on post-partum depression and the mother-infant relationship in a South African peri-urban settlement (Khayelitsha) found that the prevalence of maternal depression was 34.7%, which is three times the rate of comparable British samples. Depression was assessed using the Structured Clinical Interview for DSMIV (SCID) diagnoses. While this is a standardised and widely accepted measure (First *et al*, 1996), for which training was provided, the cross-cultural validity of the methodology remains a concern, and careful consideration is warranted in interpreting this result. The possibility of false positives, given the endemic levels of social adversity in the sample, needs to be kept in mind. Clearly, if the finding is accurate, it has enormous implications for the mental health and well being of mothers and infants alike and warrants further investigation in order to gain a fuller appreciation of the problem within the specific socio-economic, political and cultural context.

⁸ Refer to Introduction: 1.2.1 Post-Partum Depression

In the study, mother-infant dyads were videotaped in a standard, five-minute, face-to-face, interaction as described by Murray *et al* (1996). Trained researchers, blind to maternal mental state, rated the face-to-face interactions for general sensitivity, engagement, attentiveness, positive affect and quality of interaction with the coding system developed by Fiori-Cowley and Murray (details available on request from the second author). Using the assessment technique, mother-infant interactions in Khayelitsha were generally rated as poorer than those in Britain. Furthermore, results showed that maternal depression was associated with insensitive engagement with infants. It was also associated with poor emotional and practical support from partners (Cooper *et al*, 1999).

The coding system employed was developed in Britain and the authors acknowledge that, despite using Khayelitsha residents to carry out the study, the measure may be so intimately linked to the 'first' world context it was borne out of that, given cultural factors, it may be inappropriate for use in a Xhosa sample. However, they argue that there are reasons for believing that the assessment was valid. Firstly, the coding system has been used with success in a number of countries other than Britain where mother-infant relationships have been rated reliably and where meaningful group differences have emerged (e.g. Sepulveda *et al*, 1999). Furthermore, within the Khayelitsha sample, although the overall mean ratings were low, many mothers were rated as highly sensitive. This suggests that the measure is sensitive to variation in the quality of the mother-infant relationship within the Khayelitsha population.

The significance of these variations depends on whether they carry the same predictive power in relation to subsequent child development that they carry in British samples (Murray *et al*,

1993, 1996). This will be investigated in follow-up studies of the current Khayelitsha cohort, which will speak to the debate concerning the application of standard methods for assessing mother-infant interactions (Swartz, 1998), as well as, the universality of the architecture of the mother-infant relationship (Richter, 1995). The current study, which forms part of the broader research project described above, further investigates possible mechanisms through which maternal depression gives rise to developmental problems in infants in the developing world.

1.8 The Aims of the Current Study:

The aim of the study is to compare the speech of depressed and non-depressed mothers to their infants in a postpartum sample drawn from an indigent peri-urban South African community (Khayelitsha) to determine, whether:

- i) compared to non-depressed mothers, mothers with post-partum depression evidence less infant focused speech, more negative affect in their speech, and speech with less ascription of agency; and
- ii) these relationships between depression and maternal speech are especially marked where the infant is male.

Based on previous research in the 'first' world (Murray *et al*, 1993), one would hypothesise that speech of depressed mothers will be less infant focused, contain more negative affect and hold less ascription of agency; and that these differences will be more marked where infants are male. However, given that the cross-cultural aspects of maternal speech analysis are an unresearched dimension, rather than attempting to 'prove' anything definitive, the

methodology in the study sets out to be preliminary and explorative. As opposed to providing 'answers', it aims to open up the field of inquiry, posing further questions - questions that, hopefully, will serve as a useful guide for future investigation.

CHAPTER TWO - METHODOLOGY

2.1 Subjects:

The present study is located within a broader, ongoing, research project on post-partum depression and the mother-infant relationship in a South African peri-urban settlement (Cooper, Tomlinson, Swartz, Woolgar, Murray & Molteno, 1999)⁹. The 147 predominantly Xhosa speaking women who took part in the above epidemiological study made up the subjects for the current study. The demographic characteristics of the participants are described in Table 1.

Table 1 Sample characteristics

	Full sample (n=147)(%)	Non-depressed (n=96)(%)	Depressed (n=51)(%)
Age			
< 20	17.0%	15.6%	19.6%
20-24	23.1%	24.0%	21.6%
25-29	33.4%	38.5%	23.5%
30-39	26.5%	21.9%	35.3%

⁹ Refer to Introduction: 1.8 The Broader Research Project

Marital Status			
Single	62.6%	61.5%	64.7%
Married / cohabiting	37.4%	38.5%	35.3%
Infant gender			
Male	50.3%	50.0%	51.0%
Female	49.7%	50.0%	49.0%
Education			
Grade 1-7	53.1%	54.2%	51.0%
Grade 8 or higher	46.9%	45.8%	49.0%
Obstetric history			
Previous pregnancy	60.5%	61.5%	58.8%
Primiparous	39.5%	38.5%	41.2%
> 4 children	16.4%	13.7%	21.6%
Unplanned pregnancy**	51.7%	41.1%	68.6%
Unwanted pregnancy**	55.2%	34.7%	65.6%
Caesarean section	10.6%	11.8%	10.0%
Infant under 2500 g	9.9%	6.5%	16.3%
Housing			
Unserviced shack	46.3%	44.8%	49.0%
Serviced shack	48.3%	51.0%	43.2%
Serviced house	5.4%	4.2%	7.8%

**p < 0.01 for the depressed v. non-depressed comparison

Subjects ranged in age from 17 to 38, although almost half of them were under 25 years old. Nearly two-thirds of the women were single and more than half the sample had received no education beyond grade nine. Infant gender was evenly divided with 50.3% of infants being male and 49.7% female. The majority of subjects had had a previous pregnancy. The rate of Caesarean section was 11% and there was a low birth weight (less than 2 500 g) in 10% of the infants. An equal proportion of the subjects lived in serviced and unserviced shacks, with only a small minority living in serviced houses. Subjects were from one of two areas in the peri-urban settlement (Khayelitsha) outside Cape Town, namely, SST or Town II. Every attempt was made to recruit all the women living in these areas who had delivered two months previously. Researchers obtained lists of the mothers from the obstetric units that serviced SST and Town II, inquiries were made at baby clinics, and door-to-door inquiries were conducted.

2.2 Method:

Mothers were interviewed at a research base set up in Khayelitsha. Information on social circumstances, migration history, education, and employment history, previous obstetric and medical history, availability of emotional and practical support from friends and family, and child-care issues, was obtained. Trained researchers assessed maternal depression using the depression section on the Structured Clinical Interview for DSMIV diagnoses (SCID). The mother-infant dyads were videotaped in a standard interaction as described by Murray *et al*, (1996), where mothers were asked to play with or talk to her infant, face-to-face for a five-

minute period¹⁰. A Xhosa speaking research assistant transcribed the maternal speech in each of the five-minute mother-infant interactions verbatim from the videotapes. A professional translator then translated the Xhosa transcripts into English. Following this, a third bilingual research assistant (T.N.), working blind, transcribed the original Xhosa videotapes into English. The two sets of transcriptions and translations were compared and any discrepancies investigated. The back translation process was intended to enhance cross-cultural validation, rendering more credible external validity. Maternal speech was then analysed using the coding system developed by Murray¹¹. An English speaking researcher (G.G.) and a fully bilingual Xhosa speaking research assistant (T.N.) were trained to use the coding system. The coders were blind to maternal mental state. Adequate reliability was confirmed before coding of the current sample commenced. In order to account for cross-cultural validity and reliability, for a proportion of randomly selected transcripts both the Xhosa and English versions were coded independently, by the two trained coders (T.N. and G.G.). Coding was assessed for inter-rater reliability. Periodic checks on reliability were assessed as satisfactory by the original trainers.

Speech utterances were coded on the following dimensions:

- a) Focus: categories of focus:
 - i) infant focused utterances (genuine questions, tag questions, expansions and self-answers);

¹⁰ The above methodology formed part of the broader research project – refer to Introduction: 1.8 The Broader Research Project

¹¹ For details refer to Introduction: 1.5 Verbal Communication: Maternal Speech:

- ii) mother focused utterances (directives, prompt questions, calls for attention, utterances about the mother herself, corrections / criticisms and negative statements);
- iii) other focused utterances (immediate and non-immediate)

A measure of the extent to which the mother's speech was infant-focused was calculated for each subject as the proportion of infant focused utterances to the sum of infant, mother and other focused utterances

b) Negative affect:

For each subject, the number of utterances, which were either, corrections/criticisms, negative statements, directives or calls for attention was expressed as a proportion of the total number of utterances.

c) Agency: ascription to agency:

- i) agentful
- ii) not agentful

For each subject, within the infant focused utterances, the proportion was calculated of those, which explicitly ascribed agency to the infant to those where agency was not ascribed.

The results were tabulated and the data was statistically analysed in order to determine whether the speech of depressed and non-depressed mothers to their two-month infants differed significantly on dimensions of focus, negative affect and agency; whether maternal speech varied on these dimensions according to infant gender; and whether there was an interactive effect between maternal speech and infant gender.

CHAPTER THREE - RESULTS

3.1 Inter-Rater Reliability:

A random 10 % sample of the transcripts were assessed for inter-rater reliability by the original trainers. Reliability co-efficients were satisfactory with $r = 0.94$ for measures of focus, 0.93 for affect, and 0.95 for ascription of agency. Inter-rater reliability for the proportion of randomly selected transcripts that were coded independently in both Xhosa and English, by T.N. and G.G. respectively, was $r = 0.79$. Discrepancies identified were resolved by consensus.

3.2 Missing Data:

Maternal speech was analysed in 123 of the 147 mother-infant interactions. In 24 of the mother-infant dyads speech was not analysed for the following reasons:

- a) maternal speech held no translatable content for 8 of the mother-infant dyads
- b) maternal speech was in a language other than English or Xhosa for 5 of the mother-infant dyads
- c) maternal speech was too soft to be audible on the videotapes for 5 of the mother-infant dyads
- d) sessions were curtailed because infants were inconsolably distressed for 3 of the mother-infant dyads
- e) mother did not speak at all for 2 of the mother-infant-dyads

f) mother left the room for 1 mother-infant dyad

These 24 mother-infant dyads make up 16% of the sample, and as such it is important to consider the implications of this for the study. It is possible that this missing data could have skewed the sample and significantly influenced results, both in terms of maternal depression and infant gender. Of the 24 mother-infant dyads for which maternal speech was not analysed, 5 (20.8%) of the mothers were depressed and 19 (79.2%) were not depressed. Of the 147 mother-infant dyads in sample as a whole, 51 (34.6%) of the mothers were depressed and 96 (64.4%) were not depressed. There is not a dramatic discrepancy between these ratios, which makes it less likely that the missing data would have considerably clouded results on the effect of depression on maternal speech. Of the 24 mother-infant dyads for which maternal speech was not analysed, 13 (54.2%) of the infants were male and 11 (45.8%) were female. Of the 147 mother-infant dyads in the sample as a whole, 74 (50.3%) of the infants were male and 73 (49.7%) were female. These similar ratios make it less likely that the missing data would have grossly distorted the results of maternal speech on infant gender. Thus, while the missing data needs to be considered and borne in mind because of a possible skewing, it is most probable that its effect on the validity of the final results were minimal.

3.3 Characteristics of Maternal Speech:

Utterances tended to be short, with three or four words per utterance. The number of utterances per interaction ranged from 0 to 108 with a mean of 29.67 and standard deviation of 22.02. Speech was often repetitive in terms of form and content.

3.4 Descriptive Statistics:

Infant focused speech accounted for 23% of maternal utterances in the sample. Infant focused utterances ranged from 0 – 45 utterances per interaction, with a mean of 6.66 and a standard deviation of 8.56. Mother focused utterances accounted for 67% of maternal speech. They ranged, per interaction, from 0 – 65 utterances, with a mean of 18.62 and a standard deviation of 14.86. Other focused utterances were rarely expressed. Pearson's correlation coefficient confirmed a high degree of covariance between infant and mother focused utterances ($r = 0.87$). A one-sample t -test showed that, for the sample as a whole, infant focused speech was significantly less common than mother focused speech ($t = 8.6$, $df = 122$, $p < 0.001$). Negative emotion was commonly expressed in maternal speech. A mean of 55.33% (s.d. = 7.72%) of utterances, per interaction, held negative affect. In 92 of the 123 interactions mothers made use of infant focused speech. The proportion of infant focused speech, in these interactions, where the mother explicitly ascribed agency to the infant had a mean of 48.12% and a standard deviation of 38.24%. As such, in marginally more than half of infant focused speech, there was no ascription of agency to infants by mothers.

3.5 Comparison of Depressed and Non-Depressed Mothers' Speech:

Of the 123 mothers whose speech was analysed, 46 (37.4%) of the sample were depressed and 77 (62.6%) were not depressed. Independent-sample t -tests showed no significant relationship ($p < 0.05$) between depression and maternal speech, for either, focus, affect or agency:

Table 2 **Maternal Depression & Maternal Speech [%]: Comparison of Means**

		Infant focus		Negative affect		Ascription of agency	
		mean	(s.d.)	mean	(s.d.)	mean	(s.d.)
Depressed	(N=46)	23.88%	(24.67%)	60.00%	(29.16%)	42.83%	(40.26%)
Non-depressed	(N=77)	23.23%	(23.06%)	56.77%	(29.16%)	50.94%	(37.15%)

Focus: The proportion of infant focused and mother focused utterances were almost identical in the depressed and non-depressed sample. The percentage of infant focused utterances in the depressed group was 23.88 % (s.d. = 24.67%) and in the non-depressed group was 23,23% (s.d. = 23.06%). There was no significant difference between these groups ($t = 0.15$, $df = 120$, $p = 0.88$). The percentage of mother-focused utterances in the depressed group was 70.14% (s.d. = 25.26%) and in the non-depressed group was 68.14% (s.d. = 25.54%). There was no significant difference between these groups ($t = 0.42$, $df = 120$, $p = 0.68$).

Negative affect: There was no significant difference between the depressed mothers and non-depressed mothers in terms of negative affect in their speech towards their infants ($t = 0.59$, $df = 120$, $p = 0.56$). The depressed group held marginally more negative affect towards infants, with a mean of 60% (s.d. = 29.16%), than the non-depressed group, who had a mean of 56.77% (s.d. = 29.16%).

Ascription of agency: Depressed mothers ascribed less agency to their infants with a mean of 42.83% (s.d. = 40.26%) than non-depressed mothers who had a mean of 50.94% (s.d. = 37.15%). This result was not statistically significantly ($t = 0.97, df = 90, p = 0.34$).

3.6 Infant Gender and Maternal Speech:

Of the 123 mother-infant dyads where maternal speech was analysed, 61 (49.6%) of the infants were male and 62 (50.4%) were female. Independent-sample *t*-tests revealed a significant relationship ($p < 0.05$) between infant gender and ascription of agency but not between infant gender and the focus or affect of maternal speech.

Table 3 Infant Gender & Maternal Speech [%]: Comparison of Means

		Infant focus		Negative affect		Ascription of agency	
		mean	(s.d.)	mean	(s.d.)	mean	(s.d.)
Male	(N=61)	22.62%	(21.90%)	55.22%	(26.48%)	38.32%	(36.68%)*
Female	(N=62)	24.29%	(25.23%)	60.61%	(31.38%)	58.37%	(37.51%)*

* $p < 0.05$ for ascription of agency to male versus female infants.

Focus: The proportion of infant focused and mother focused utterances were almost identical for male and female infants. The percentage of infant focused utterances in the male infant group was 22.62 % (s.d. = 21.90%) and in the female group was 24,29% (s.d. = 25.23%). There was no significant difference between these groups ($t = 0.39, df = 120, p = 0.69$). The percentage of mother focused utterances in the male infant group was 67.74%

(s.d. = 23.93%) and in the female infant group was 69.98% (s.d. = 26.81%). There was no significant difference between the groups ($t = 0.49$, $df = 120$, $p = 0.63$).

Negative affect: Mothers tended to use more negative affect in interactions with female infants, however, this result was not statistically significant ($t = 1.0$, $df = 120$, $p = 0.31$). The mean negative affect was 55.22 % (s.d. = 26.48%) for male infants and 60.61% (s.d. = 31.38%) for female infants.

Ascription of agency: Mothers ascribed significantly less agency ($p < 0.05$) to male infants than to female infants ($t = 2.6$, $df = 90$, $p = 0.011$). Mean ascription of agency to male infants was 38.32% (s.d. = 36.68%) and to female infants was 58.37% (s.d. = 37.51%).

3.7 Suggestions for Future Data Analysis :

Following on from the above results the next step in terms of data analyses would be to perform a multivariate analysis of variance. This type of statistical analysis requires that the data be normally distributed. However, the results of the current investigation yielded a non-normal distribution. In order to adjust the data to fit a normal distribution the speech variables would need to be transformed to scales more likely to be appropriate for multivariate analyses. As such, following Murray *et al* (1993), there was an attempt to apply a logistic transformation to the speech variables, which were already expressed as proportions [that is, p transformed to $\log(p/(1-p))$]. Unlike Murray *et al* (1993), however, the logistic transformation was unsuccessful and thus, multivariate analyses could not be performed.

The task of further statistical analyses will be to chunk the data into ordinal variables and run non-parametric analyses such as the chi-square statistical test and / or logistic regressions. This analysis is currently underway and will be the subject of subsequent reports. The suggested analyses may well yield rich and profitable results within the broader research project, building and expanding on the current findings. It will allow for further investigation of the relatedness of maternal speech and infant gender to the non-verbal variables of maternal sensitivity, infant engagement, infant attentiveness, infant affect and the quality of mother-infant interaction measured by Cooper *et al* (1999).

CHAPTER FOUR - DISCUSSION

4.1 Context for Interpretation:

The results of the broader research project by Cooper *et al* (1999) indicate that the prevalence of maternal depression in Khayelitsha mothers was three times that of a comparable British sample. This finding is consistent with the argument that South African mothers are a high-risk group, vulnerable to developing post-partum depression. The current thesis has maintained that maternal depression has a negative impact on mother-infant interaction and subsequent infant development, although little is known regarding the exact mechanism by which this comes about. Murray & Cooper (1997) have hypothesised that the mechanism responsible for negative infant outcome is an impaired pattern of communication between mother and infant. Within this, Murray has suggested that maternal verbal communication, in particular, be examined. Subsequent investigation in 'first' world samples has found the maternal speech of depressed mothers to be less infant focused, hold more negative affect and less ascription of agency to infants, than the speech of non-depressed mothers (Murray *et al*, 1993). Accordingly, this was the expected outcome of the current research on a 'third' world sample.

4.2 The Results Interpreted:

The results of the present study do not support the initial hypothesis. Investigation of the Khayelitsha sample found no significant difference between the speech of depressed and non-depressed mothers to their two-month old infants. Compared to non-depressed mothers,

mothers with post-partum depression did not evidence less infant focused speech, more negative affect, or speech with less ascription of agency. The findings run contrary to what was anticipated and raise interesting and key questions that need to be addressed in the course of understanding and interpreting the results. Some of these questions include the following: does depression manifest differently in the developed and developing worlds?; can one use standardised measures trans-culturally?; does speech play a consistent role across cultures?; are there factors unique to South Africa which confound results?; is there utility in making cross-cultural comparisons?

If one assumes that the results obtained in the investigation are valid and reliable then it would appear that, unlike 'first' world samples, maternal depression does not significantly impact on maternal speech to infants in this 'third' world sample. For reasons that are unclear, maternal verbal communication does not seem to be an index of depression in Khayelitsha mothers. The speech variables of focus, negative affect and ascription of agency were not sensitive to the effects of depression as measured by the Structured Clinical Interview for DSMIV diagnoses (SCID), which is a widely used and validated standardised method of clinical assessment (First *et al*, 1996). The notion that maternal speech is not a valid marker of maternal depression in this Xhosa speaking sample has theoretical implications for the literature, in terms of Murray's hypothesis regarding the role of maternal speech. Within the parameters of the population under study, maternal verbal communication to infants does not appear to be the mechanism whereby maternal depression gives rise to negative infant outcome. One possible explanation for this outcome may be linked to the observation that somatic features play a central role in the expression of depression as an 'idiom of distress' (Swartz, 1998) within the present cultural context. It has been noted that,

on the whole, developing world populations are more likely to make use of somatisation, as opposed to verbal expression for instance, as a defense and coping mechanism (Cox, 1988). Consequently, depression is more likely to be manifest in terms of bodily symptoms and physical illness, than in populations of the developed world (Cox, 1988). Given this, it follows that maternal speech may be a less valid marker of maternal depression in South Africa than in British samples. The implication of this interpretation is that, within the current context, maternal verbal communication is too narrow a measure to be utilised and that there is a need to employ broader markers of maternal depression when exploring and attempting to understand how maternal depression (for example, non-verbal communication and interactive patterns) impacts on mother-infant interaction and subsequently gives rise to developmental problems in infants. This is consistent with the notion put forward earlier in this paper¹² that mother-infant communication is a complex phenomenon that is, both verbal and non-verbal, bi-directional and mutually regulated. It also encourages broader inquiry, beyond the mother's role, extending into the infant's role in the process and the interaction between them.

The key issue highlighted by this discussion is that reducing the complexity of the mother-infant engagement to include only maternal verbal communication is probably too simplistic to be of value in the context of the developing world. On this basis, future research could usefully explore broader markers of maternal depression in relation to mother-infant communication, in addition to maternal speech, in order to gain a more holistic appreciation of the issues involved. A number of factors need to be considered in sensitively evaluating

¹² Refer to Introduction: 1.4 Communication as the Critical Variable

the validity of this interpretation of the results. Most notably, a critical evaluation of the relative strengths and weaknesses of the methodology employed is required.

4.3 Methodological Critique:

The sample used in the current study comprised of a relatively young and predominantly single group of mothers living in a peri-urban settlement where social stress and adversity are endemic, and support is lacking. Given this, it is highly possible that the levels of social adversity within the sample could have had a masking effect on maternal depression, potentially clouding results and acting as a broad confounding variable. The manner in which the study was carried out made it impossible to clearly separate out the effects of maternal depression on maternal speech to infants, from the effects of social adversity. The absence of adequate indices of maternal adversity in this research is a shortcoming and future investigations of this nature would do well to include such measures. Social adversity could then be controlled for so that its effects can be isolated and more carefully disentangled from the effects of maternal depression, providing a clearer understanding.

There is evidence supporting the likelihood that social adversity did constitute a confounding variable when examining the descriptive results of the entire sample. As a whole, maternal speech within the sample was significantly less infant focused than mother focused, with a high degree of negative affect expressed and relatively little ascription of agency to infants. Thus, if one ignores the distinction between depressed and non-depressed mothers, the results for the entire sample closely match the expected outcome for a depressed group of mothers in the 'first' world. What this suggests is that adversity may impact on the non-depressed group

'baseline' so that speech output is generally depressed. Interesting results may well be yielded by a statistical comparison between the current sample and an equivalent 'first' world sample, particularly if there is a measure of maternal adversity for the developed sample.

The participants that took part in this investigation were from a Xhosa culture and lived in township circumstances. One needs to consider the artificial environment of the laboratory situation in which the mother-infant interactions took place. The relatively foreign nature of this setting in the 'third' world, as opposed to the 'first' world, may well have had an influence on the validity of the interactions. The demand characteristics of the setting may have inhibited and disadvantaged the Xhosa mothers. One wonders whether the results obtained would have differed if the mothers had first been familiarised with the setting, or if a naturalistic observation was conducted. It is also possible that a Hawthorne effect¹³ led mothers to significantly alter their behaviour in such a manner that the video-recorded speech obtained was not an accurate reflection of the 'natural' verbal communication of mothers to their infants. The use of Xhosa speaking interviewers from the community was an attempt to counteract these effects. However, it is possible that the language output of Xhosa mothers was affected by virtue of the context and the perceived demands of the experimental setting, by culture, by the globally depressing levels of adversity¹⁴, or by a combination of these factors.

In terms of sampling strategy, every attempt was made to include all the new mothers in the population within the designated areas of Khayelitsha. Despite the missing data on the

¹³ Performance affected by knowledge that the subject is participating in a study

¹⁴ i.e. Adversity effects speech output of mothers regardless of whether they are depressed or not

speech analysis¹⁵, which is argued would probably not have significantly influenced the results, the final sample size was 123 mother-infant dyads. A sample of this size is considered reasonable and adds strength to the external validity of the investigation and the generalisability of the results within similar contexts. It remains unclear, however, to what extent these results transcend culture.

The subjects were Xhosa speaking. It is possible that the Xhosa language and translation is not suitable to the type of speech analysis that was applied in this study. The coding system employed to analyse maternal speech has been validly and reliably used in English speaking, 'first' world samples (Murray *et al.* 1993). In the present study training was provided for using the coding system and inter-rater reliability checks were assessed as satisfactory. Professional translation, back translation, and the use of Xhosa speaking researchers, render this part of the process as credible as possible. Despite this, a key point in this research is that the speech variables of focus, affect and agency, and the categories within them may, in and of themselves, be culture bound. Normative studies of speech patterns are required. Xhosa mothers speak to their infants and, in that, maternal speech it is a universal process. However, one cannot ignore that they may have different emphases for variables such as agency. Also, speech may be less prominent in communication patterns in this sample and coupled with the global effects of adversity and relatively low education, the indices may not be sensitive to clinical depression.

Cross-cultural aspects of maternal speech analysis have been an unresearched dimension and the degree to which motherese transcends culture remains an issue of debate. However,

¹⁵ Refer to Results 3.2 Missing Data

preliminary analysis of the speech variables within the context of the broader research project¹⁶, beyond the scope of this study, has yielded the following results: where maternal speech was more infant focused, infants were significantly more positively engaged and more attentive than where speech was mother centred; where maternal speech was more negative, infants were significantly less positively engaged and less attentive; and when mothers ascribed agency, infants were more positively engaged and more attentive. These results reveal that the maternal speech variables are significantly related to measures of positive engagement and infant attentiveness. This finding suggests that the coding system used to analyse speech does hold a degree of validity within the Khayelitsha sample.

4.4 A Comment on Infant Gender:

In examining the effects of gender, the results of the study showed that the focus of maternal speech did not vary according to infant gender. However, mothers did ascribe significantly less agency to male infants than to female infants. In addition, mothers tended to express more negative affect towards female infants than towards male infants, although not significantly so. The reasons that mothers would ascribe less agency to male infants and also tend to express less negative affect towards them are not clear. One possible explanation is that Khayelitsha mothers are less tolerant of female dependency and, in contrast, perhaps encourage male dependency. Cultural factors may underlie this observation. However, further investigation is needed to understand the nature of this result more fully. What is evident from these results on infant gender is that there does appear to be some qualitative difference in the way in which mothers in this sample verbally communicate with their male

¹⁶ Results not yet published

and female infants. This supports previous research where gender differences have been observed (e.g. Malatesta & Haviland, 1982; Tronick & Cohn, 1989).

Given the non-normal distribution of the data and the inability to perform multivariate analyses, the interactive effect of maternal depression and infant gender on maternal speech cannot be commented on here. This will be the task of future research. Based on the current information available, it is not possible to make further valid interpretations and conclusions that move beyond speculation. However, it is maintained that exploring the role of infant gender remains a useful variable in informing the debates, both with regards to mother-infant communication, given its bi-directional nature, and with regards to the degree to which infant gender differences transcend cultural and are universal.

4.5 Conclusion:

This study found no significant difference between the maternal speech of depressed and non-depressed Khayelitsha mothers to their infants. Maternal speech did differ according to infant gender in that mothers ascribed less agency to males infants than to female infants. These results have been discussed, interpreted and critically evaluated. Despite methodological limitations the results appear to hold validity and reliability and open up new avenues for future research, which was one of the principal aims of this exploratory study. In addition, it is felt that the results and questions raised by the current research are useful contributions to the expanding body of knowledge in this field of inquiry.

CHAPTER FIVE - CONCLUSIONS AND RECOMMENDATIONS:

Debates around the universality of the architecture of the mother-infant bond and the use of standardised measures across cultures continue. The mechanisms through which maternal depression affects mother-infant interaction and subsequent infant development remain unclear. The current research findings highlight the following issues and suggest: i) within the developing world context, maternal verbal communication alone may be too narrow an index in exploring these mechanisms, and that other dimensions of mother-infant communication need to be included in future studies; ii) the necessity of factoring in cultural differences and particularities in language utilisation and expression in this type of research; iii) the importance of controlling for levels of social adversity within the South African climate, given the endemic levels of social stress, which may act as a confounding variable in investigations of this nature – as is suggested in this case where social adversity may well have had a globally depressing effect on maternal speech output thus masking depression. Further exploration of infant gender differences is also recommended given the complex nature of the subject. This exploratory study has methodological limitations and has only begun to address the need for a deeper understanding of post-partum depression and the mechanisms through which it is expressed in developing contexts. Further research is needed in the area in order to better inform effective intervention in what appears to be a considerable problem in this country. Work in the area can only contribute towards the improved well-being and mental health of the South African people.

REFERENCES

- Abas, M. & Broadhead, J. (1997). Depression and anxiety among women in an urban setting in Zimbabwe. *Psychological Medicine*, **27**, 59-71.
- Abas, M., Broadhead, J., Mbape, P. & Khumalo-Sakatukwa, G. (1994). Defeating depression in the developing world: a Zimbabwean model. *British Journal of Psychiatry*, **164**, 293-296.
- Abou-Saleh, M. T. & Ghubash, R. (1997). The prevalence of early postpartum psychiatric morbidity in Dubai: a transcultural perspective. *Acta Psychiatrica Scandinavica*, **95**, 428-432.
- Aderibrigbe, Y. A., Gureje, O. & Omigbodun, O. (1993). Postnatal emotional disorders in Nigerian women. *British Journal of Psychiatry*, **163**, 645-650.
- Ainsworth, M. D., Blehar, M. C., Waters, E. & Wall, S. (1978). *Patterns of attachment: a psychological study of the strange situation*. Hillsdale, NJ: Lawrence Erlbaum.
- Ainsworth, M. D. & Wittig, B.A. (1969). Attachment and exploratory behaviour in one year olds in a strange situation. In B. M. Foss (Ed.), *Determinants of infant behaviour* (Vol. 4). London: Methuen.
- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental*

Disorders (4th ed., Text Revision) (DSM-VI-TR). Washington, DC:APA.

- Areias, M. E. G., Kumar, R., Barros, H. & Figueiredo. (1996). Correlates of postnatal depression in mothers and fathers. *British Journal of Psychiatry*, **169**, 36-41.
- Bahar, E., Henderson, A. S. & Mackinnon, A. J. (1992). An epidemiological study of mental health and socio-economic conditions in Sumatra, Indonesia. *Acta Psychiatrica Scandinavica*, **85**, 257-263.
- Beebe, B., Jaffe, J., Feldstein, B., Mays, K. & Alson, D. (1985). Interpersonal tuning: the application of an adult dialogue to mother-infant vocal and kinetic interactions. In T. M. Field & N. A. Fox (Eds.), *Social perception of infants*. Norwood: Ablex.
- Beebe, B. & Lachmann, F. M. (1994). Representations and internalization in infancy: three principles of salience. *Psychoanalytic Psychology*, **11**, 127-165.
- Bettes, B. A. (1988). Maternal depression and motherese: temporal and intonational features. *Child Development*, **59**, 1089-1096.
- Bowlby, J. (1969). *Attachment*. London: Penguin.
- Brazelton, T. B., Koslowski, B., & Main, M. (1974). The origins of reciprocity: the early mother-infant interaction. In M. Lewis & L. A. Rosenblum (Eds.), *The effect of the infant on its caregiver*. New York: Wiley.

Brazelton, T. B., Tronick, E., Adamson, C., Als, H. & Wise, S. (1975). Early mother-infant reciprocity. In *Parent-infant interaction*. Ciba Foundation Symposium No. 33. Amsterdam: Elsevier.

Bretherten, I. (1995). *The origins of attachment theory*. In S. Goldberg, R. Muir & J. Kerr (Eds.), *Attachment theory: social, developmental and clinical perspectives*. London: The Analytic Press.

Breznitz, Z. & Sherman, T. (1987). Speech patterning of natural discourse of well and depressed mothers and their young children. *Child Development*, **58**, 395-400.

Broadhead, J. C. & Abas, M. A. (1998). Life events, difficulties and depression among women in an urban setting in Zimbabwe. *Psychological Medicine*, **28**, 29-38.

Campbell, S. B., Cohn, J. F. & Meyers, T. (1995). Depression in first-time mothers: mother-infant interaction and depression chronicity. *Developmental Psychology*, **31(3)**, 349-357.

Cazden, C. (1972). *Child language and education*. New York: Holt, Rinehart and Winston.

Charlesworth, W. R. & Kreutzer, M. A. (1973). Facial expressions of infants and children. In P. Ekman (Ed.), *Darwin and facial expressions*. New York: Academic.

- Cicchetti, D. Rogosch, F. A. & Toth, S. L. (1998). Maternal depressive disorder and contextual risk: contributions to the development of attachment insecurity and behavior problems in toddlerhood. *Development and Psychopathology*, **10**, 283-300.
- Cogill, S., Caplan, H., Alexandra, H., Robson, K. & Kumar, R. (1986). Impact of postnatal depression on cognitive development in young children. *British Medical Journal*, **292**, 1165-1167.
- Cohn, J. F., Campbell, S. B., Matias, R. & Hopkins, J. (1990). Face-to-face interactions of postpartum depressed and nondepressed mother-infant pairs at 2 months. *Developmental Psychology*, **26(1)**, 15-23.
- Cohn, J. F., Matias, R., Tronick, E. Z., Connell, D. & Lyons-Ruth, K. (1986). Face-to-face interactions of depressed mothers and their infants. In E. Z. Tronick & T. Field (Eds), *Maternal depression and infant disturbance*. San Francisco: Jossey-Bass Inc., Publishers.
- Cooper, P. J., Campbell, E. A., Day, A., Kennerly, H. & Bond, A. (1988). Non-psychotic psychiatric disorder after childbirth. A prospective study of prevalence, incidence, course and nature. *British Journal of Psychiatry*, **152**, 799-806.
- Cooper, P.J., Tomlinson, M., Swartz, L., Woolgar, M., Murray, L. & Molteno, C. (1999). Post-partum depression and the mother-infant relationship in a South African peri-urban settlement. *British Journal of Psychiatry*, **175**, 554-558.

- Cox, J. L. (1994). Perinatal psychiatry: east is east and west is west. *British Journal of Psychiatry*, **164**, 420.
- Cox, J. L. (1988). The life event of childbirth: sociocultural aspects of postnatal depression. In R. Kumar & I. Brockington (Eds), *Motherhood and Mental Illness (vol. II)*. London: Wright.
- Cox, J. L. (1986). *Postnatal depression*. Edinburgh: Churchill Livingstone.
- Cox, J. L. (1979). Psychiatric morbidity and pregnancy: a controlled study of 263 semi-rural Ugandan women. *British Journal of Psychiatry*, **134**, 401-405.
- Cox, J. L., Connor, Y. & Kendell, R. E. (1982). Prospective study of the psychiatric disorders of childbirth. *British Journal of Psychiatry*, **140**, 111-117.
- Cox, J. L., Murray, D. & Chapman, G. (1993). A controlled study of the onset, duration and prevalence of postnatal depression. *British Journal of Psychiatry*, **163**, 27-31.
- Cross, T. (1977). Mothers' speech adjustments: the contribution of selected child listener variables. In C. E. Snow & C. A. Ferguson (Eds), *Talking to children: language and input and acquisition*. Cambridge: Cambridge University Press.
- Cummings, E. M. (1995). Security, emotionality and parental depression: a commentary.

Developmental psychology, **31(3)**, 425-427.

Cummings, E. M. & Cicchetti, D. (1990). Towards a transactional model of relations between attachment and depression. In M. T. Greenberg, D. Cicchetti & E. M. Cummings (Eds.), *Attachment in the preschool years*. Chicago: University of Chicago Press.

Da Costa, D., Larouche, J., Dritsa, M. & Brender, W. (2000). Psychosocial correlates of prepartum and postpartum depressed mood. *Journal of Affective Disorders*, **59**, 31-40.

Darwin, C. (1872) 1965. *The expression of the emotions in man and in animals*. Chicago: University of Chicago Press.

Da-Silva, V. A., Moraes-Santos, A. R., Carvalho, M. S., Martins, M. L. P. & Teixeira, N. A. (1998). Prenatal and postnatal depression among low income Brazilian women. *Brazilian Journal of Med. Biol. Res.*, **31(6)**, 799-804.

Dean, C. & Kendell, R. E. (1981). The symptomatology of puerperal illness. *British Journal of Psychiatry*, **139**, 128-133.

Eisenberg, R. B. (1975). *Auditory competence in early life: the roots of communicative behaviour*. Baltimore: University Park Press.

- Fendrich, M., Warner, V. & Weissman, M. M. (1990). Family risk factors, parental depression, and psychopathology in offspring. *Developmental Psychology*, **26**(1), 40-50.
- Ferguson, C. A. (1977). Baby talk as a simplified register. In C. E. Snow & C. A. Ferguson (Eds.), *Talking to children: language and input and acquisition* (pp. 219-235). Cambridge: Cambridge University Press.
- Fernald, A. (1985). Four-month-old infants prefer to listen to motherese. *Infant Behaviour and Development*, **8**, 181-195.
- Field, T. M. (1995). Infants of depressed mother. *Infant Behaviour and Development*, **18**, 1-13.
- Field, T. M. (1992). Infants of depressed mothers. *Development and Psychopathology*, **4**, 49-66.
- Field, T. M. (1986). Models for reactive and chronic depression in infancy. In E. Z. Tronick & T. Field (Eds), *Maternal depression and infant disturbance*. San Francisco: Jossey-Bass Inc., Publishers.
- Field, T. M. (1977). Effects of early separation, interactive deficits and experimental manipulations on infant-mother face-to-face interaction. *Child Development*, **48**, 763-771.

- First, M. B., Spitzer, R. L., Gibbon, M., *et al* (1996). *Structured Clinical Interview for DSM-IV Axis I*. New York: New York State Psychiatric Institute.
- Galler, J. R. & Harrison, R. H., Ramsey, F., Forde, V. & Butler, S. (2000). Maternal depressive symptoms affect infant cognitive development in Barbados. *Journal of Child Psychology and Psychiatry*, **41**(6), 747-757.
- Gelfand, D. M. & Teti, D. M. (1990). The effects of maternal depression on children. *Clinical Psychology Review*, **10**, 329-353.
- Ghubash, R. & Abou-Saleh, M. T. (1997). Postpartum psychiatric illness in Arab culture: prevalence and psychosocial correlates. *British Journal of Psychiatry*, **171**, 65-68.
- Gleitman, L. R., Newport, E. L. & Gleitman, H. (1984). The current status of the motherese hypothesis. *Journal of Child Language*, **11**, 43-79.
- Godfrey, H. P. D. & Knight, R. G. (1984). The validity of actomotor and speech activity measures in the assessment of depressed patients. *British Journal of Psychiatry*, **145**, 159-163.
- Grossmann, K. E. (1995). *The evolution and history of attachment research and theory*. In S. Goldberg, R. Muir & J. Kerr (Eds.), *Attachment theory: social, developmental and clinical perspectives*. London: The Analytic Press.

- Hammen, C., Burge, D. & Stansbury, K. (1990). Relationship of mother and child variables to child outcomes in a high-risk sample: a casual modeling analysis. *Developmental Psychology*, **26(1)**, 24-30.
- Harris, B. (1981). 'Maternity Blues' in East African clinic attenders. *Archives of General Psychiatry*, **38**, 1293-1295.
- Hart, S., Jones, N. A., Field, T. & Lundy, B. (1999). One-year-old infants of intrusive and withdrawn depressed mothers. *Child Psychiatry and Human Development*, **30(2)**, 111-120.
- Hayworth, J., Little, B. C., Bonham Carter, S., Raptopoulos, P., Priest, R. G. & Sandler, M. (1980). A predictive study of post-partum depression: some predisposing characteristics. *British Journal of Psychiatry*, **53**, 161-167.
- Hoffman, G. M. A., Goze, J. C. & Mendlewicz, J. (1985). Speech pause time as a method for the evaluation of psychomotor retardation in depressive illness. *British Journal of Psychiatry*, **146**, 535-538.
- Hoffman, M., Pick, W. M., Cooper, D. & Myers, J. E. (1997). Women's health status and use of health services in a rapidly growing peri-urban area of South African. *Social Science Med.*, **45(1)**, 149-157.

- Holmes, J. (1995). *John Bowlby, attachment theory and psychoanalysis*. In S. Goldberg, R. Muir & J. Kerr (Eds.), *Attachment theory: social, developmental and clinical perspectives*. London: The Analytic Press.
- Jones, N. A., Field, T., Fox, N., Davalos, M., Malphurs, J., Carraway, K., Schanberg, S. & Kuhn, C. (1997). Infants of intrusive and withdrawn mothers. *Infant Behavior and Development*, **20(2)**, 175-186.
- Kleinman, A. & Good, B. (Eds), (1985). *Culture and depression: studies in the anthropology and cross-cultural psychiatry of affect and disorder*. Berkeley: University of California Press.
- Kraepelin, E. (1921). *Manic-depressive insanity and paranoia*. Edinburgh: Livingstone.
- Kumar, R. (1994). Postnatal mental illness: a transcultural perspective. *Social Psychiatry Psychiatric Epidemiology*, **29**, 250-264.
- Kumar, R. & Robson, K. (1984). A prospective study of emotional disorders in childbearing women. *British Journal of Psychiatry*, **144**, 35-47.
- Leboyer, F. (1974). *Birth without violence*. London: Wildwood
- Lee, D. T., Yip, A. S., Chiu, H. F., Leung, T. Y. & Chung, T. K. (2001). A psychiatric epidemiological study of postpartum Chinese women. *American Journal of*

Psychiatry, **158(2)**, 220-226.

Lieven, E. V. M. (1978). Conversations between mothers and young children: individual differences and their possible implications for the study of language learning. In N. Waterson & C. E. Snow (Eds), *The development of communication* (pp. 173-187). New York: Wiley.

Lyons-Ruth, K., Connell, D. B. & Grunebaum, H. U. (1990). Infants at social risk: maternal depression and family support services as mediators of infant development and security of attachment. *Child Development*, **61**, 85-98.

Lyons-Ruth, K., Zoll, D., Connell, D. & Grunebaum, H. U. (1986). The depressed mother and her one-year-old infant: environment, interaction, attachment and infant development. In E. Z. Tronick & T. Field (Eds), *Maternal depression and infant disturbance*. San Francisco: Jossey-Bass Inc., Publishers.

Malatesta, C. Z. & Haviland, J. M. (1982). Learning display rules: the socialization of emotion expression in infancy. *Child Development*, **53**, 991-1003.

Maratos, O. (1973). *The origin and development of imitation in the first six months of life*. Unpublished PhD dissertation, University of Geneva.

Marks, M. (1995, June). Stresses in the South African Police Service. Paper presented to Stress Management Self Help Group for Police in Soweto, Protea Police Station.

- Marrone, M. (1998). *Attachment and Interaction*. London: Jessica Kingsley Publishers.
- Martins, C. & Gaffan, E. A. (2000). Effects of early maternal depression on patterns of infant-mother attachment: a meta-analytic investigation. *Journal of Child Psychology and Psychiatry*, **41**(6), 737-746.
- Moss, H. A. (1967). Sex, age, and state as determinants of mother-infant interaction. *Merrill-Palmer Quarterly*, **13**, 19-36.
- Mumford, D. B., Saeed, K., Ahmad, I., *et al* (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. (1988). Effects of postnatal depression on infant development: direct studies of early mother-infant interactions. In R. Kumar & I. Brockington (Eds.), *Motherhood and Mental Illness (vol. II)*. London: Wright.
- Murray, L. & Cooper, P.J. (1997). Postpartum depression and child development. *Psychological Medicine*, **27**, 253-260.
- Murray, L. & Cooper, P. J. (1996). The impact of postpartum depression on child

development. *International Review of Psychiatry*, **8**, 55-63.

Murray, L., Fiori-Cowley, A., Hooper, R. & Cooper, P. J. (1996). The impact of postnatal depression and associated adversity on early mother-infant interactions and later infant outcome. *Child Development*, **67**, 2512-2526.

Murray, L., Kempton, C., Woolgar, M. & Hooper, R. (1993). Depressed mothers' speech to their infants and its relation to infant gender and cognitive development. *Journal of Child Psychology and Psychiatry*, **34**, 1083-1101.

Murray, L., Stanley, C., Hooper, R., King, F. & Fiori-Cowley, A. (1996). The role of infant factors in postnatal depression and mother-infant interactions. *Developmental Medicine and Child Neurology*, **38**, 109-119.

Murray, L. & Trevarthen, C. (1985). Emotional regulation of interactions between 2 month olds and their mothers. In T. M. Field & N. A. Fox (Eds.), *Social perception in infants*. Norwood, NJ: Ablex.

Murray, L. & Trevarthen, C. (1986). The infant's role in mother-infant communication. *Journal of Child Language*, **13**, 13-29.

Myers, J. K., Weissman, M. M., Tischler, G. L., Holzer III, C. E., Leaf, P. J., Orvaschel, H., Anthony, J. C., Boyd, J. H., Burke Jr, J. D., Kramer, M. & Stolzman, R. (1984). Six-month prevalence of psychiatric disorders in three communities. *Archives of*

General Psychiatry, **41**, 959-967.

Nel, J. A. & Burgers, T. J. (1995, October). The South African Police Service – ‘Symptom Bearer’ of the new South Africa. Paper presented at the Regional Conference on Mental Health Policy, Cape Town.

Nelson, K. (1973). Structure and strategy in learning to talk. *Monographs for the Society of Research in Child Development*, **38**, No. 149.

Newport, E. L., Gleitman, H. & Gleitman, L. R. (1977). Mother, I’d rather do it myself: some effects and non-effects of maternal speech style. In C. E. Snow & C. A. Ferguson (Eds.), *Talking to children* (pp. 109-149). Cambridge: Cambridge University Press.

O’Hara, M. W. (1986). Social support, life events, and depression during pregnancy and the puerperium. *Archives of General Psychiatry*, **43**, 569-573.

O’Hara, M. W., Neunaber, D. J. & Zekoski, E. M. (1984). Prospective study of postpartum depression: prevalence, course and predictive factors. *Journal of Abnormal Psychology*, **93**, 158-171.

O’Hara, M. W. & Swain, A. M. (1996). Rates and risk of postpartum depression – a meta-analysis. *International Review of Psychiatry*, **8**, 37-54.

- O'Hara, M. W. & Zekoski, E. M. (1988). Postpartum depression: a comprehensive review. In R. Kumar & I. Brockington (Eds), *Motherhood and Mental Illness (vol. II)*. London: Wright.
- Olsen-Fulero, L. (1982). Style and stability in mother conversational behaviour: a study of individual differences. *Journal of Child Language*, **9**, 543-564.
- Osofsky, J. D. & O'Connell, E. J. (1977). Patterning of newborn behaviour in an urban population. *Child Development*, **48**, 532-536.
- Oxman, T. E., Rosenberg, S. D., Schnurr, P. P. & Tucker, G. J. (1988). Diagnostic classification through content analysis of patients' speech. *American Journal of Psychiatry*, **145**, 464-468.
- Papousek, M. (1989). Determinants of responsiveness to infant vocal expression of emotional state. *Infant Behaviour and Development*, **12**, 507-524.
- Papousek, H & Papousek, M. (1975). Cognitive aspects of preverbal social interaction between human infants and adults. In *Parent Infant Interaction*. Ciba Foundation Symposium No. 33. Amsterdam: Elsevier.
- Patel, V., Simunya, F. & Gwanzura, F. (1997). The pathways to primary mental health care in high-density suburbs in Harare, Zimbabwe. *Social Psychiatry Psychiatric Epidemiology*, **32**, 97-103.

- Paykel, E. S., Emms, E. M., Fletcher, J. & Rassaby, E. S. (1990). Life events and social support in puerperal depression. *British Journal of Psychiatry*, **136**, 339-346.
- Radke-Yarrow, M., Belmont, B., Nottelmann, E. & Bottomly, L. (1990). Young children's self-conceptions: origins in the natural discourse of depressed and normal mothers and their children. In D. Cicchetti & M. Beeghly (Eds), *The self in transition: infancy to childhood* (pp. 345-361). Chicago: University of Chicago Press.
- Radke-Yarrow, M., Cummings, E. M., Kuczynski, L. & Chapman, M. (1985). Patterns of attachments in two- and three-year-olds in normal families and families with parental depression. *Child Development*, **56**, 884-893.
- Rahim, S. I. A. & Cederblad, M. (1989). Epidemiology of mental disorders in young adults of a newly urbanised area in Khartoum, Sudan. *British Journal of Psychiatry*, **155**, 44-47.
- Richter, L. M. (1995). Are early adult-infant interactions universal? A South African view. *South African Journal of Child and Adolescent Psychiatry*, **7**, 2-18.
- Robson, K. S. (1967). The role of eye-to-eye contact in maternal-infant attachment. *Journal of Child Psychology and Psychiatry*, **8**, 13-25.
- Rutter, M. (1990). Some focus and process considerations regarding effects of parental

depression on children. *Developmental Psychology*, **26**, 60-67.

Rutter, M. & Quinton, D. (1984). Parental psychiatric disorder: effects on children. *Psychological Medicine*, **14**, 853-880.

Rutter, M. (1966). The developmental psychopathology of depression: issues and perspectives. In M. Rutter, C. E. Izard, & P. B. Read (Eds.), *Depression in young people*. New York: Guilford.

Scherer, K. R. (1986). Vocal affect expression: a review and model for future research. *Psychological Bulletin*, **99**, 143-165.

Schore, A. N. (2001). Minds in the making: attachment, the self-organizing brain, and developmentally-oriented psychoanalytic psychotherapy. *British Journal of Psychotherapy*, **17(3)**, 299-328.

Seifer, R., Sameroff, A. J., Dickstein, S., Keitner, G., Miller, I., Rasmussen, S. & Hayden, L. C. (1996). Parental psychopathology, multiple contextual risks, and one-year outcomes in children. *Journal of Clinical Child Psychopathology*, **25(4)**, 423-435.

Sepulveda, M. A., Lapez, G., Azar, M. C., *et al* (1999). Example of one model of intervention across marginal sectors. *Journal of the University of the Metropolis*, **8**, 231-248.

- Snow, C. E. (1976). Mothers' speech in three social classes. *Journal of Psycholinguistic Research*, **5**, 1-20.
- Snow, C. E. (1977). The development of conversation between mothers and babies. *Journal of Child Language*, **4**, 1-22.
- Sprangler, G., Fremmer-Bombik, E. & Grossmann, K. (1996). Social and individual determinants of infant attachment security and disorganization. *Infant Mental Health Journal*, **17**(2), 127-139.
- Stein, A., Gath, D.H., Bucher, J., Bond, A., Day, A & Cooper, P.J. (1991). The relationship between postnatal depression and mother child interaction. *British Journal of Psychiatry*, **158**, 46-52.
- Stern, D. (1985). *The interpersonal world of the infant: a view from psychoanalysis and developmental psychology*. New York: Basic Books.
- Stern, D. (1974). Mother and infant at play: the dyadic interaction involving facial, vocal and gaze behaviors. In M. Lewis & L. A. Rosenblum (Eds.), *The effect of the infant on its caregiver*. New York: Wiley.
- Stern, D. N., Beebe, B., Jaffe, J. & Bennett, S. L. (1977). The infant's stimulus world

during social interaction: a study of caregiver behaviours with particular reference to repetition and timing. In H. K. Schaffer (Ed.), *Studies in mother-infant interaction*. New York: Academic Press.

Swartz, L. (1998). *Culture and Mental Health: A Southern African View*. Cape Town: Oxford University Press.

Teasdale, J. D., Fogarty, S. J. & Williams, J. M. G. (1980). Speech rate as a measure of short-term variation in depression. *British Journal of Social and Clinical Psychology*, **19**, 271-278.

Teti, D. M., Gelfand, D. M., Messinger, D. S. & Isabella, R. (1995). Maternal depression and the quality of early attachment: an examination of infants, preschoolers, and their mothers. *Developmental Psychology*, **31(3)**, 364-376.

Trevarthen, C. (1979). Communication and cooperation in early infancy: a description of primary intersubjectivity. In M. Bullowa (Ed.), *Before speech: the beginning of interpersonal communication* (pp. 321-348). Cambridge: Cambridge University Press.

Tronick, E. Z. & Cohn, J. F. (1989). Infant-mother face-to-face interaction: age and gender differences in coordination and occurrence of miscoordination. *Child Development*, **60**, 85-92.

- Tronick, E. Z. & Gianino Jr, A. F. (1986). The transmission of maternal disturbance to the infant. In E. Z. Tronick & T. Field (Eds.), *Maternal depression and infant disturbance*. San Francisco: Jossey-Bass Inc., Publishers.
- Van der Merwe, J. (1993). Annual Report of the Commissioner of the South African Police. (ISBN 0 621 16053 9 RP 58/1994). South Africa: Government Printing Office.
- Weinberg, M. K. & Tronick, E. Z. (1998). The impact of maternal psychiatric illness on infant development. *Journal of Clinical Psychiatry*, **59(2)**, 53-61.
- Weissman, M. M. & Paykel, E. S. (1974). *The depressed woman: a study of social relationships*. Chicago: University of Chicago Press.
- Weissman, M. M., Paykel, E. S. & Klerman, G. L. (1972). The depressed woman as a mother. *Social Psychiatry*, **7**, 98-108.
- Winnicott, D.W. (1960). The Theory of the Parent-Infant Relationship. In J. D. Sutherland (Ed.), *The Maturation Processes and the Facilitating Environment*. New York: International Universities.
- Winnicott, D.W. (1960). Ego Distortion in Terms of the True and False Self. In J. D. Sutherland (Ed.), *The Maturation Processes and the Facilitating Environment*. New York: International Universities, 1965.

- Wolff, P. H. (1963). Observations on the early development of smiling. In B. M. Foss (Ed.), *Determinants of infant behaviour*. London: Methuen.
- Wrate, R. M., Rooney, A.C., Thomas, P. F. & Cox, J. L. (1985). Postnatal depression and child development: a three-year follow-up study. *British Journal of Psychiatry*, **146**, 622-627.
- Zahn-Waxler, C. (1995). Parental depression and distress: implications for development in infancy, childhood, and adolescence. *Developmental Psychology*, **31(3)**, 347-348.

Post-Partum Depression as Defined by the Diagnostic and Statistical Manual IV-TR

(text revision)(American Psychiatric Association, 2000)

■ **Criteria for Major Depressive Episode**

- A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.

Note: Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.

- (1) depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). **Note:** In children and adolescents, can be irritable mood.
 - (2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others)
 - (3) significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. **Note:** In children, consider failure to make expected weight gains.
 - (4) insomnia or hypersomnia nearly every day
 - (5) psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)
 - (6) fatigue or loss of energy nearly every day
 - (7) feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)
 - (8) diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)
 - (9) recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide
- B. The symptoms do not meet criteria for a Mixed Episode (see p. 335).
- C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).
- E. The symptoms are not better accounted for by Bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

■ **Diagnostic criteria for 296.2x Major Depressive Disorder, Single Episode**

- A. Presence of a single Major Depressive Episode (see p. 327).
- B. The Major Depressive Episode is not better accounted for by Schizoaffective Disorder and is not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Otherwise Specified.
- C. There has never been a Manic Episode (see p. 332), a Mixed Episode (see p. 335), or a Hypomanic Episode (see p. 338). **Note:** This exclusion does not apply if all of the manic-like, mixed-like, or hypomanic-like episodes are substance or treatment induced or are due to the direct physiological effects of a general medical condition.

Specify (for current or most recent episode):

Severity/Psychotic/Remission Specifiers (see p. 376)

Chronic (see p. 382)

With Catatonic Features (see p. 382)

With Melancholic Features (see p. 383)

With Atypical Features (see p. 384)

With Postpartum Onset (see p. 386)

■ **Diagnostic criteria for 296.3x Major Depressive Disorder, Recurrent**

- A. Presence of two or more Major Depressive Episodes (see p. 327).
Note: To be considered separate episodes, there must be an interval of at least 2 consecutive months in which criteria are not met for a Major Depressive Episode.
- B. The Major Depressive Episodes are not better accounted for by Schizoaffective Disorder and are not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Otherwise Specified.
- C. There has never been a Manic Episode (see p. 332), a Mixed Episode (see p. 335), or a Hypomanic Episode (see p. 338). **Note:** This exclusion does not apply if all of the manic-like, mixed-like, or hypomanic-like episodes are substance or treatment induced or are due to the direct physiological effects of a general medical condition.

Specify (for current or most recent episode):

Severity/Psychotic/Remission Specifiers (see p. 376)

Chronic (see p. 382)

With Catatonic Features (see p. 382)

With Melancholic Features (see p. 383)

With Atypical Features (see p. 384)

With Postpartum Onset (see p. 386)

Specify:

Longitudinal Course Specifiers (With and Without Interepisode Recovery) (see p. 387)

With Seasonal Pattern (see p. 389)

■ **Criteria for Postpartum Onset Specifier**

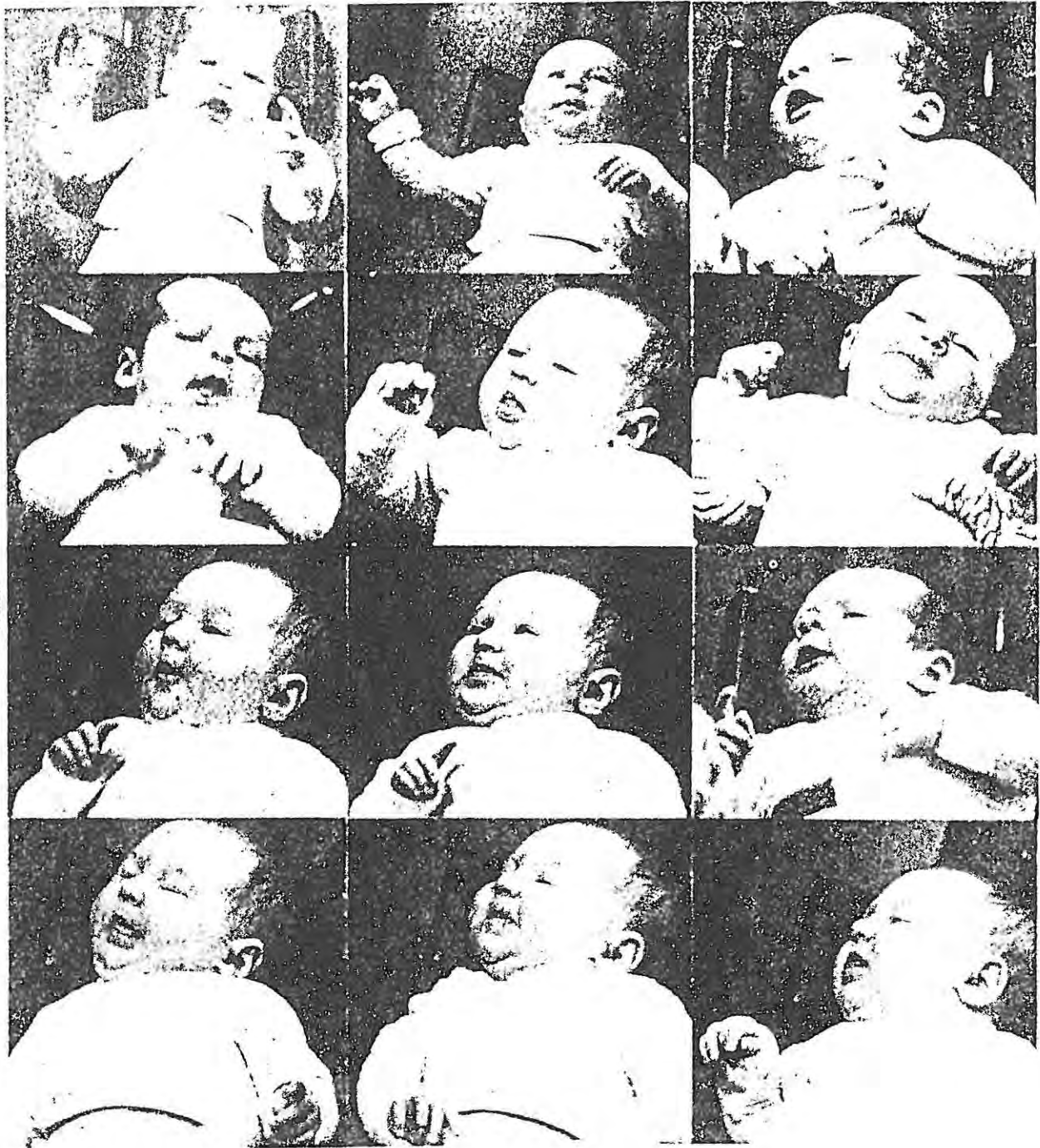
Specify if:

With Postpartum Onset (can be applied to the current or most recent Major Depressive, Manic, or Mixed Episode in Major Depressive Disorder, Bipolar I Disorder, or Bipolar II Disorder; or to Brief Psychotic Disorder)

Onset of episode within 4 weeks postpartum

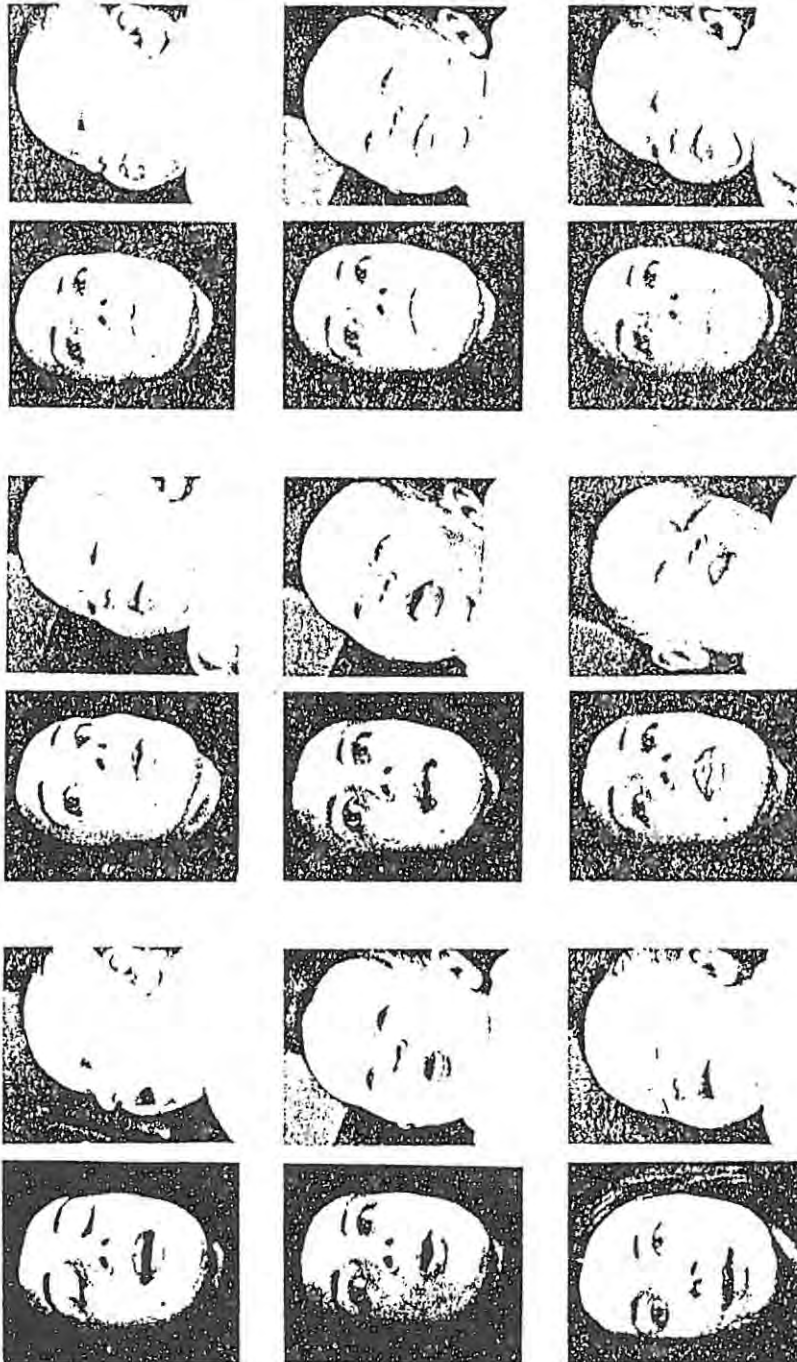
APPENDIX II

Photographic Examples of Total Patterns of Body Expression in Infants,
Patterns That Appear Similar to Dance (Trevarthen, 1979)



APPENDIX III

Photographic Examples of Adult Facial Expression Found in Video Recordings of
Infants and Newborns (Trevvarthen, 1979)



Photographic Examples of Adult Facial Expression Found in Video Recordings of
Infants and Newborns (Trevarthen, 1979)

