

**The Effect of a Responsive Parenting Program on Maternal Perception of Child
Temperament, Mother-Child Bonding, and Maternal Mood.**

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Abstract

Many Australian mothers attend Residential Early Parenting Programs to relieve distress and exhaustion due to child sleep and settling problems. This study extends current knowledge of programs by examining improvements in maternal and child outcomes one week after completing a three to four night Residential Responsive Parenting Program at Tweedle Child and Family Health Service; whether improvements were sustained at eight-week follow up; and whether improvements were independent of maternal mood changes. A prospective cohort study with a consecutive sample ($N = 42$) of predominately Australian born mothers ($M = 32.6$ years), with a child under 18 months ($M = 9.6$ months), were recruited at intake. Response rates were low (17.7%), with 29% retained at follow up. No attrition bias was detected. A RM-MANOVA ($n = 12$) demonstrated significant post-program improvements for maternal mood ($p = .03$), maternal perception of mother-child bonding ($p = .03$) and child temperament ($p = .01$), maternal sense of competence ($p = .02$), and maternal sleep quantity ($p = .01$). Child sleep quantity did not improve significantly. Improvements were sustained at follow up, additionally, maternal perception of mother-child bonding improved significantly ($p = .04$). Effect sizes were large ($\eta^2 = .33-.53$). A RM-MANCOVA ($n = 24$), with the covariate maternal mood difference, revealed no significant treatment effects. However, interaction effects were found with maternal perception of mother-child bonding ($p = .001$) and child temperament ($p = .03$), and maternal sense of competence ($p = .04$). Thus, while causation could not be attributed to the parenting program due to study design, improvements in maternal perception of mother-child bonding and child temperament, and maternal sense of competence interacted with a decrease in maternal depression symptoms. However, when maternal mood stabilized, additional improvements were perceived in mother-child bonding, suggesting that these variables are related, yet distinct concepts. Replication with a randomized, controlled study design is recommended.

Doctor of Psychology Declaration

I, Kim Perrow, declare that the Doctor of Psychology (Clinical Psychology) thesis entitled ‘**The Effect of a Responsive Parenting Program on Maternal Perception of Child Temperament and Mother-Child Bonding, and Maternal Mood**’ is no more than 40,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes.

This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signed..... Dated.....

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“I once risked the remark, ‘There is no such thing as a baby’ meaning that if you set out to describe a baby, you will find you are describing a *baby and someone*. A baby cannot exist alone, but is essentially part of a relationship.”

(Winnicott, 2013, p. 137)

“...because successful parenting is a principal key to the mental health of the next generation, we need to know all we can both about its nature and about the manifold social and psychological conditions that influence its development for better or worse.”

(John Bowlby, 2012, p. 1)

The Effect of a Responsive Parenting Program on Maternal Perception of Child Temperament, Mother-Child Bonding, and Maternal Mood.

Chapter 1. Introduction

Having a child is often described as a joyful and life-changing event. However, the wonder and excitement of creating a newborn infant is short lived for many mothers when they find themselves confronted with the challenging demands which accompany the care of a newborn. Mothers may experience myriad emotions when adjusting to their new role, which may differ significantly to that which they had expected. Furthermore, as infants can be unpredictable and vary greatly in their need for comfort, food and sleep, there may be a discrepancy between the vision mothers had of their child's behaviours and responses, and the reality.

In particular, the joy of parenthood is marred for many mothers by the distress and frustration they feel when they experience sleep and settling problems with their children (Oberklaid, 2000), including crying, fussiness, irritability, unpredictability, and 'colic' (Don, McMahon & Rossiter, 2002). Frustration can lead to depression, which in turn can have a devastating effect on both mother and child, and their relationship. In Melbourne, Australia, infant sleep problems are common across socioeconomic levels with a third of parents reporting sleep problems in infants less than six months of age (Bayer, Hiscock, Hampton, & Wake, 2007).

Of those who seek help in Australia, many do so from primary-level services such as maternal and child health centre nurses and general practitioners, secondary-level early parenting programs, and tertiary-level specialist mother-child psychiatric units (Fisher, Rowe, & Hammarberg, 2011). In 2002, approximately 5% of Victorian mother-child dyads were

admitted to early parenting services, and 0.9% of dyads were admitted to specialist psychiatric units (Fisher, Rowe & Hammarberg, 2011).

Early parenting programs in Australia are offered through both the private and public health system, and are delivered via home-based visits, group psycho-education sessions, day stay programs or residential services. Although similar services are available in many countries, Australia appears to be the only country which offers mothers the opportunity to self-refer to 'residential' early parenting programs, where mothers and their infants stay 'in residence' for the duration of a program of two to five days and nights, often with their partner also in attendance (Rowe & Fisher, 2010). One such program is cited as having been studied in New Zealand by American researchers Middlemiss, Granger, Goldberg and Nathans (2012), however, no evidence of the program's ongoing availability could be found by the current researcher.

In Victoria there are three public, and two private, residential early parenting services (Fisher, Rowe & Hammarberg, 2011; Rowe & Fisher, 2010; Treyvaud, Rogers, Matthews & Allen, 2009). Programs are generally based on highly structured psycho-educational information (Fisher, Rowe & Hammarberg, 2011) and aim to improve adjustment to parenthood and relieve parental exhaustion by increasing parental confidence and knowledge of infant development, improve maternal mood, and design and implement sleep and settling routines to meet the needs of individual families. To this end, sleep and settling routines have generally been behaviour based, and primarily aimed to teach infants to self-settle, thus decreasing the need for parents to assist their child to sleep, and therefore reducing the night time waking of the parents and increasing their opportunity to sleep. (Rowe & Fisher, 2010). Furthermore, there is evidence that residential early parenting program infant sleep interventions have resulted in improvements in maternal depressive symptoms (Hiscock & Wake, 2002). It has therefore been argued that residential early parenting programs play an

important role in providing treatment for non-psychotic maternal depressive symptoms (Fisher, Rowe & Hammarberg, 2011; Rowe & Fisher, 2010).

This study will examine the effects of a residential early parenting program conducted at one of Victoria's three publicly funded early parenting centres. The residential early parenting program at Tweddle Child and Family Health Service (Tweddle) in Melbourne is conducted over three - four days and nights. A previous version of the program focused on the abovementioned goals, and implemented a highly structured psycho-education program designed to modify infant behaviour with the aim of educating the infant to 'self-settle'. The earlier Tweddle program was evaluated in 2002 by Rowe and Fisher (2010) and had demonstrated improvements in maternal and child functioning. Rowe and Fisher surveyed 58 mothers, with infants under twelve months of age, at three time periods; on admission to the program, and at one and six months post discharge. The results indicated that when admitted to the program, self-referred participants had poor mental and physical health, and limited social support, and they reported that their child had substantial behavioural problems. One month after completion of the program, mothers reported significant improvements in their mood including worry, sadness and irritability, energy levels, thought clarity, ability to function efficiently, and their maternal confidence. These improvements were sustained at six month follow up. Further, mothers reported improvements in their child's behaviours such as a decline in crying and fussing, an increase in the length of day time sleep, and a decrease in night time waking. These results were also sustained at six month follow-up. Overall 88% of participants were satisfied with the program, and 75% found the nurses and other mothers supportive and helpful.

In recent years Tweddle has adapted its residential early parenting program to reflect a more parentally 'responsive' approach, including strategies which educate and familiarise parents with their infant's individual cues, with the aim of enhancing parent-child

interactions. During the current program parents attend daily, individual and group, information sessions where they are encouraged to respond to their infant's cues rather than following a prescriptive routine. Tweddle staff members are available to assist parents with reading their infant's cues, and sleep and settling procedures, both day and night. The Tweddle 'responsive' program is similar in structure to the publicly funded residential program offered at a The Queen Elizabeth Centre in Melbourne (Treyvaud et al., 2009) and is discussed further in this chapter in section 1.3, and in Chapter Three, section 3.2.

Of particular interest in this study is whether the current 'responsive' residential early parenting program at Tweddle adequately addresses the aforementioned aims of early parenting programs, whilst also focusing on the relationship between the mother and her child, as to date the outcomes of this program have not been examined. Furthermore, it is also of interest to this study to assess whether the current Tweddle 'responsive' program achieves similar benefits to maternal and child functioning as the previously offered Tweddle program studied in 2002 by Rowe and Fisher (2010). Therefore, along with maternal mood and amount of child and maternal sleep, the current study will examine changes in maternal perception of mother-child bonding and infant temperament, in addition to maternal sense of competence, in mothers who attend the 'responsive' residential early parenting program conducted at Tweddle.

It is acknowledged at this point that both parents play a very important role in the care and upbringing of their child. With no disrespect intended to fathers and their opinions, the current research is measuring and discussing the above variables from a maternal perspective. Thus, the words 'mother' or 'maternal' will primarily be used, however, it is recognised that the words father, paternal, or both parents could equally be substituted in most instances.

1.1. Early Parenting Program Models

There are divergent views of the approach that should be taken by early parenting programs and the subsequent advice that should be given to assist parents of unsettled infants. On opposite ends of the spectrum are Infant Behavioural Management (IBM) and Intuitive Parenting (IP; Fisher, Rowe & Hiscock, et al., 2011). St James-Roberts (2007) described these parenting approaches as “structured” or “infant demand”, with each approach having different costs and benefits. The major theoretical differences between these approaches have a direct influence on the guidelines and techniques recommended for sleep, settling and feeding (Fisher, Rowe & Hiscock, et al., 2011). These techniques are discussed in greater detail below.

1.1.1. Infant Behavioural Management (IBM).

The IBM model takes a 'parent down' systematic approach gradually reducing the infant's dependence on the parent for settling to sleep, and resettling to sleep after waking at night. This is most often accomplished by encouraging self-soothing and self-settling by reducing sleep associations which require the parent's presence, delaying the response to the unsettled child for gradually increased timed periods (often referred to as controlled crying, or controlled comforting), and eliminating overnight feeding to allow for longer periods of sleep. Parents are also provided with information regarding infant development and capacities, and the need for consistency in the environment, and in day and night time routines (Fisher, Rowe & Hiscock, et al., 2011). Early parenting program interventions have typically utilized an IBM approach, thus improving maternal mood by changing child behaviour, and utilizing behaviour modification techniques to encourage independent sleep and settling. Intervention effectiveness has been seen as an increase in total hours of sleep for baby and mother per day, a decrease in time that baby cries or is unsettled, improved maternal rating of child behaviour, improvement in marital relationships, and improved

maternal psychosocial well-being (Fisher, Feekery & Rowe, 2004; Fisher, Rowe & Hammarberg, 2011; Fisher, Rowe & Hiscock, et al., 2011; Hiscock & Wake, 2002).

1.1.1.1 Evidence for the IBM approach.

Fisher, Rowe and Feekery (2004) studied infant temperament and behaviour, and maternal mood of attendees at an early parenting program. They reported the results of 59 mothers, with infants between four and twelve months of age, who attended a five night structured residential IBM oriented psycho-educational program at Masada Private Hospital Mother and Baby Unit in Melbourne, Victoria. They utilized the Short Infant Temperament Questionnaire and Barr charts to assess the infant cohort, and the Edinburgh Postnatal Depression Scale and the Profile of Mood States to measure maternal mood. When compared with ratings at admission, they reported statistically significant improvements in maternal mood and infant behaviours, such as crying and fussing, one month post attendance; these gains were sustained at six months.

Hiscock and Wake (2002) conducted a randomised controlled trial of an IBM sleep intervention, controlled crying, with 156 mothers of infants aged six to twelve months. The intervention consisted of three, fortnightly, private consultations that included education on sleep management and instruction on implementing controlled crying. The results yielded significant improvements in infant sleep problems, maternal quality and quantity of sleep, and maternal mood at two month follow up when compared to the control group, who only received a single sheet of information on normal infant sleep patterns. However, the authors reported that by four months the results were not significantly different from the control group, with the exception of mothers who initially had high depression scores.

A recent study into the physiological synchrony of mothers and their infants, by Middlemiss et al. (2012), investigated the effect of a five night, inpatient, IBM signaling and crying extinction and self-settling sleep training program conducted in a New Zealand

hospital. In this study, mothers attended to the day time needs of their infants, aged four to ten months, however, the night time and nap time extinction protocol was administered by the program nurses for the first three nights, whilst the mother remained close enough to hear the infant's signals of distress, such as crying. Saliva samples were used to measure cortisol levels and were taken from 25 mother-infant dyads 20 minutes before initiation of the sleep routine, and 20 minutes after the infant had fallen asleep, on the first and third day of the program. Results indicated that the mother and infant were synchronized on the first day of the program. That is, both had low cortisol levels after sharing time together, and elevated cortisol levels after infants behaviourally expressed distress in response to the sleep intervention. By the third day infants appeared to habituate to the new settling regime, no longer displaying behavioural distress. However, infant cortisol levels remained elevated, suggesting that infants continued to experience physiological distress, despite showing no outward sign of this. The results also suggested that in the absence of a behavioural cue of distress from the infant, mothers' stress levels decreased, as indicated by a decrease in their cortisol levels. Therefore, despite a reduction in exhibited behavioural distress the infant cortisol levels remained elevated, whilst the maternal cortisol level decreased resulting in asynchrony between the mothers' and infants' cortisol levels. The researchers suggested that this study should be replicated in a program which does not use the extinction protocol to ensure that the decrease in mothers' cortisol was not due to extraneous variables such as an increase in maternal confidence (Middlemiss et al., 2012). What is interesting about these results is that they highlight the possibility that infants may still experience distress, physiological and perhaps psychological, as a result of an IBM sleep intervention, despite a reduction in their behavioural expression of protest.

Research on the IBM approach has generally paid little attention to the emotional needs of the child, and mother-child attachment. An exception to this is Matthey and Speyer's (2008) evaluation of a four night structured residential psycho-educational program

which provided attendees with information on developmentally appropriate infant behaviour in a supportive environment, and also included IBM sleep and settling techniques. Their study of 116 participants, with children aged three weeks to three years, examined changes in the presenting problem of unsettled infant sleep behaviour using a one page subjective assessment. The assessment also allowed participants to attribute the cause of the change; for example, due to the program, the infant being older, or to some other external cause.

The authors also included measures of maternal depression and anxiety, experience of being a mother, and mother-infant bonding. They reported statistically significant improvements at five week follow up for all outcome measures, and that these improvements were maintained at four month follow up. This suggests that an IBM intervention can effectively improve maternal anxiety and depression symptoms, infant sleep, experience of motherhood, and mother-child bonding. However, the improvement in infant sleep reported by 73.9% of respondents was a retrospective report of perceived change in presenting problem, rather than a quantitative improvement in hours of child or maternal sleep, or night time waking. In light of the improvement in mother-child bonding, it is possible that the perceived change in the presenting problem was due to the mother feeling closer to her child, and appraising his or her behaviour as less troublesome, or burdensome. Further, gains in education, and perhaps changes in expectations with regard to developmentally appropriate sleep and nighttime waking, may have led to an improved perception of the child's behaviour due to greater understanding and normalising of the infant's sleep behaviour (Matthey & Speyer, 2008).

Matthey and Speyer (2008) also cautiously concluded that for women with self-reported, sub-optimal mother-child bonding, the IBM approach may not improve infant sleep behaviour. This is consistent with the above surmising; that the actual presenting problem may not have changed so much as the mother's perception of the child's behaviour had

improved because of a greater understanding of her baby, and/or, an improvement in mother-infant bonding. Thus, it cannot be shown that the program actually improved the child's sleep problem (Matthey & Speyer, 2008).

In sum, the above findings indicate that there is evidence that for most, the IBM approach attains the goals of improving maternal mood and experience of motherhood, reducing maternal fatigue, increasing the amount of infant sleep, and decreasing infant fussiness and crying (Hiscock & Wake, 2002; Matthey & Speyer, 2008; Middlemiss et al., 2012; Rowe & Fisher, 2010).

1.1.2. Intuitive Parenting (IP)

In contrast to IBM, the IP approach is a 'child up' model, which encourages parents to assist infants to sleep and settle by recognising and responding immediately to their individual cues. This includes actively comforting the infant every time they require it by holding, carrying in a sling or harness, rocking, and feeding or suckling them 'on demand' (Fisher, Rowe, Hiscock et al., 2011). These techniques increase the infants' sense of security by providing a consistent and supportive response to their needs or distress.

Nugent, Keefer, Minear, Johnson, and Blanchard (2007) explained that infants are born with an immature and unregulated physiological and emotional system. Infants develop the capacity to self-regulate through the parent's self-regulation and caregiving behaviours. When the parent holds and feeds the child in a sensitive manner, and responds consistently to their cues, they provide the child with a safe space to develop his or her own sense of self and ability to self-regulate emotional and physiological responses. This is consistent with Bowlby (2012), who states that when a mother is in tune with her child's communication of needs, an intuitive and reliable response from the mother can create a sense of a safe and secure base for her child. Bion (1983, 1989) conceptualized the idea that, the parent models containment to the child, by holding or containing their distressing and overwhelming

emotions such as fear, anxiety and discomfort. These emotions are often expressed as crying or irritability and by holding that which is unbearable for the child in a calm manner, the parent transforms these distressing communications into tolerable experiences for the child, leading to the child feeling more contained. If the parent cannot contain the negative emotions and responds by crying, yelling or withdrawing the child may receive the message from the parent that the child, or his or her problem, is intolerable, which may lead to further distress for the child.

Winnicott (1957) described the need for mothers to hold their child both physically and emotionally in his or her immature state of un-integrated dependence. He argued that the care is beyond the conscious thought and deliberate intention of the mother, that it is intuitive and comes from a love that is necessary to instinctively meet the needs of the child, at times even before the child signals that need. Furthermore, by satisfying the physical needs of the child as they arise, the mother enables the development of the infant psyche with herself as a model (Winnicott, 1957).

1.1.2.1 Evidence for the IP approach.

The IP approach prioritises the mother-child relationship over the quantity of sleep and amount of infant fussing, and has been found to be effective for improving parent-child relations in populations where children are 'at risk' (Letourneau et al., 2001). Further, in a randomized placebo-controlled study of 103 infants under the age of nine months, Jordan, Heine, Meehan, Catto-Smith, and Lubitz (2006) found that an IP intervention was just as effective as anti-reflux medication and a placebo for reducing crying duration, enhancing the motherhood experience, and reducing maternal stress. Further, the IP intervention was more effective at reducing subsequent admissions to mother-infant units for infants with persistent crying (Jordan et al., 2006).

In industrialized societies infant crying is said to peak in amount at six weeks of age, before slowly diminishing up to the age of four months. Further, parents report that infants tend to have a cluster of crying in the evening. Hunziker and Barr (1986) found that the IP practice of wearing infants in a carrier for three hours per day, not just when the infant was crying, was more effective at eliminating the crying peak, and decreasing the cluster of evening crying than a control group who exposed their infants to visual stimuli when the infants were placed in their crib. The randomized controlled study followed the crying patterns of 99 breastfed infants from the age of three to twelve weeks. The intervention was more effective than the control at four, eight and twelve weeks. However, the greatest impact was at the six week time point with a reduction in crying over controls of 43% during the day, and a decrease of evening crying by 57%. The authors concluded that the practice of not carrying infants in industrialized societies may predispose normal infants to colic and increased amounts of crying. However, they recommended that these results should be replicated in non-breastfeed infants to allow for generalization (Hunziker & Barr, 1986).

In a study by Jung, Short, Letourneau, and Andrews (2007) an IP intervention based on the Keys to Caregiving program (Spietz, Johnson-Crowley, Sumner & Barnard, 1990) was shown to effectively improve infant communication and increase infant positive responsiveness in children of depressed mothers, independent of the level of maternal depression. Further, Moehler, Brunner, Wiebel, Reck, and Resch (2006) found support for a critical period during the first four months of life, when, in order to combat the negative effects of postnatal depression on the child, interventions should be aimed at improving mother-infant relationships, rather than focusing only on improving maternal mood.

Letourneau et al. (2001) reported the results of a pilot study investigating an IP intervention based on the Keys to Caregiving program (Spietz et al. 1990), in a population where children were at an increased risk of developing a mental health problem. They

investigated post program outcomes for 15 mothers of infants aged between 7 and 13 weeks, all with low socioeconomic status. The program consisted of six, weekly, home visits by a trained pediatric nurse. Mothers were introduced to five key concepts thought to be essential for increasing the parent's understanding of infant behaviours, cues and needs. These include infant states, infant behaviour, infant cues, modulation of infant states, and interacting during feeding (Letourneau et al., 2001). Although the sample size was small, results showed that the seven randomly assigned mothers in the intervention group scored higher than the comparison group on sensitivity to infant cues, responsiveness to infant distress, fostering social-emotional growth, and fostering cognitive growth (Letourneau et al., 2001).

1.2. Which parenting model is better?

In a review of the IBM and IP literature and evidence, St James-Roberts (2007) concluded that it is understandable that parents might want to combine the IBM and IP approaches. He concluded that the IP approach is associated with less infant crying and fussing in the first three months than the IBM approach, however, when the infant is older than three months the IBM approach appears to result in reduced night time waking when compared with the IP approach.

Although infant crying and fussing, and night time waking are the most common complaints from new parents (St James-Roberts, 2007), there are more factors to consider when deciding which parenting approach should be advocated to parents. For example advising a mother to follow her intuition may not automatically lead to an infant led response as her intuition may be impaired by her own childhood experience with parental interactions (Fisher, Rowe, Hiscock et al., 2011). This argument may also apply to mothers with postnatal depression, sleep deprivation or a low sense of competence.

St James-Roberts (2007) also highlighted the fact that some infants still tended to have unsoothable bouts of crying regardless of the parenting approach. Thus, it was more important to reassure parents that these bouts of crying are not the parent's fault. He suggested that the focus should not be on preventing crying, but rather on containing the infant's emotions and increasing the parent's coping skills. He also emphasised that structured parenting does not have to equate to the use of controlled crying. However, IP proponents would argue that structured or IBM parenting by name, implies that it is parent led and that the techniques are directed by the end needs of the parent.

There may never be agreement on which approach is most effective. The two models are theoretically different, with each placing value on different outcomes. Further, it is difficult to attain convergence amongst the literature or empirical evidence as the efficacy of each approach is commonly measured in different ways, with IP predominantly measuring child and relationship focused outcomes, and IBM favouring outcome measures with a maternal or behavioural focus. Moreover, it may not be appropriate to follow a single model, as St James-Roberts (2007) highlighted, as forcing parents to choose one parenting approach implies that babies' needs are static. Rather, there needs to be recognition that children need different parenting approaches at different developmental stages and it is more important to externally regulate and scaffold the child's individual developmental needs in order to facilitate autonomous learning (St James-Roberts, 2007).

1.3. The Responsive Parenting Program – which model?

The three to four day and night residential Responsive Parenting Program being evaluated in this study was conducted at Tweddle Child and Family Health Service (Tweddle), in Melbourne. It appears to follow a similar format to the 5 day and night residential program offered at the publicly funded Queen Elizabeth Centre, also located in Melbourne (Treyvaud et al., 2009). For example, parents attend group and individual

sessions during the day, where they receive education regarding transition to parenting, infant states, infant behaviour, infant cues, and infant state modulation, to encourage an appreciation of the individual characteristics and preferences of their child. As attendees stay overnight during the program, Tweddle staff are available to offer assistance 24 hours per day to assist parents to implement the strategies learnt during the education sessions.

In the context of the program conducted at Tweddle, the term ‘responsive’ refers to educating and encouraging parents to listen to their child’s cues, and to understand their child’s communication of needs. For example the child may be lying quietly, actively awake, tired, grizzling, crying, or distressed. Most importantly, ‘responsive’ means remaining flexible when settling the child, with the adult’s response to be led by the child, without time limits (Tweddle, 2011).

The Tweddle program appears to combine elements of both the IP and the IBM approaches. Whilst the parents are encouraged to be ‘responsive’ to their infant’s cues, the settling techniques include both IP and IBM approaches and are implemented with the aim of increasing the child’s amount of sleep and ability to settle independently.

Parents are involved in deciding which technique they will use. For example, they may choose to settle their child in their arms (this is recommended up to three months only). Alternatively, they may choose to settle the child in the child’s bed whilst remaining in the room (Tweddle, 2011). The aim of the techniques offered is to gradually encourage the child to ‘self-settle’ and become an independent sleeper. Parents are encouraged to respond to their child’s cues and to leave the room if the child is calm, to give the child an opportunity to fall asleep on their own. If the child is quiet and calm, parents are to check on him or her after ten minutes. However, if the child signals a protest, parents are encouraged to wait and listen to the protest of the child. If the child is fussing parents are encouraged to give the

child an opportunity to self-settle, however, parents are encouraged to return to the room if the child becomes distressed.

Parents are encouraged to calm an unsettled baby in the first instance by using ‘hands on’ comforting strategies such as gentle rhythmic patting or stroking, or making shush sounds. If these attempts are unsuccessful, parents are then encouraged to pick up and comfort their child (Tweddle, 2011). This approach is very similar to that described by Matthey and Speyer in that there was a ‘progressive waiting’ approach when infants were protesting, but not clearly distressed. This is contrasted with the ‘controlled crying’ approach (Hiscock & Wake, 2002) where parents respond to their child’s cry at increasing time intervals with minimal intervention.

Irrespective of the technique used, IP or IBM, undoubtedly addressing and improving maternal and child outcomes is of uppermost importance for early parenting programs. As mentioned above, programs aim to improve adjustment to parenthood and relieve parental exhaustion by increasing maternal and child quantity and quality of sleep, improving maternal mood, parental confidence and knowledge of infant development, and enhancing the mother-child relationship. The literature and evidence associated with these variables will be discussed in detail in Chapter 2.

Chapter 2. The Concepts Under Investigation

2.1. The Mother-Child Relationship

The relationships between amount and quality of maternal and child sleep, settling programs (Dennis & Ross, 2005; Eckerberg, 2004; Meltzer & Mindall, 2007), and maternal mood (Hiscock & Wake, 2002) have been well researched. Therefore, the primary topic under investigation in this study is the effect of a responsive parenting program on maternal perception of the relationship between the mother and her child.

The quality of mother-child attachment is thought to have a direct bearing on the present and future mental health of the child (Schoore, 2001). A neurobiological model suggests that positive and adaptive early, non-verbal, mother-child interactions lead to optimal development of the right hemisphere of the child's brain where the connection to the limbic and the autonomic response systems is the deepest. These systems are thought to be critical in the development of affect regulation and effective coping styles both of which will determine later life response and adaptation to stress (Schoore, 2001). Therefore, a positive relationship between mother and child assists the child to develop adaptive responses to stressors and management of emotions.

The neurobiological model lends support to Bion's (1983, 1989) concept of containment discussed previously, and Bowlby's (1991) work on attachment theory which emphasized the effect of early family experiences on later mental health disturbances. Bowlby (2012) believed that the mental health of the next generation was dependent on successful parenting, and that the central feature of successful parenting was the provision of a 'secure base' for children. He went on to say that a secure base allows a child to feel safe in the outside world as it involves a 'knowing' by the child of the ability to return to a place where he or she will feel welcomed, physically and emotionally nourished, comforted, and

reassured. Bowlby (2012) further stated that mothers can help to create the sense of a secure base in their child by being available to respond when called upon for assistance. The response is seen to be intuitive as a result of the mother being in tune with, and paying heed to, her child's individual communications. Schore (2001) agreed, and he described attachment theory as essentially a regulatory theory. Schore surmised that as the infant comes into contact with a secure mother, she acts as a regulator at an unconscious, intuitive level by consistently offering a calm and supportive stance, effectively modeling to the child that the environment is safe. The infant is then able to modulate his or her stress response to match that of the mother. As the infant brain develops, the secure mother scaffolds the immature emotional regulation of the infant when confronted with stressors, both painful and novel (Schore, 2001).

Ainsworth (1979) wrote that throughout the first year of life the most effective response to infant crying was to pick the baby up. She went on to report that close body contact is at least as important as face to face interaction, particularly in the first few months of life. Indeed the way the infant is held, rather than how long it is held, is important in the development of attachment. So too with regard to feeding, Ainsworth stated that it is not how the infant is fed, breast or bottle, but rather the response to the infant's cues around when to start, at what pace and when to stop feeding. A mother who is accessible and responds sensitively to her infant's signals assists in the development of the child's internal working model of a reliable and safe base. In turn this enhances mother-child bonding and creates a secure environment from which the child can explore (Ainsworth, 1979).

2.1.1. The benefit of teaching parents to be intuitive and responsive.

In an unpublished paper, Nugent et al. (2006) discussed the outcome of a study of 118 first time mothers. They compared the onset rates of postnatal depression in mothers who received an intervention which included the administration of the Newborn Behavioral

Observation (NBO; Nugent et al., 2007) system, with mothers in a control group. The NBO is a short and easily administered series of structured observations of a newborn's capabilities. The NBO system is designed to capture the integration of the autonomic, motor, organization of state, and responsivity domains which develop during the first few months of an infant's life. During the assessment the infant's capacity to habituate to external light and sound, the quality of the infant's motor tone and activity level, the infant's capacity for self-regulation (e.g. self-soothing to reduce crying), response to stress and threshold for stimulation, visual and auditory alertness, and social-interaction capabilities are examined in response to human and non-human stimuli are highlighted.

The NBO can be administered by trained health professionals in approximately 10 minutes at routine primary healthcare checkups, for example, during the course of undressing the baby for weight and height assessments. Parents are included in all aspects of the observations, with some elements of the NBO is able to be conducted even when the child is asleep in a parent's arms. The aim of the NBO is to enhance parent-child interactions and bonding by eliciting newborn behaviour and then describing and interpreting the observations for the parents. Attention is drawn to the child's strengths and ability to communicate his or her preferences, and areas in which the child may need support to habituate to the environment in order to reduce distress are identified. This information is then integrated into an individual caregiving plan that fosters a positive parent-child interaction and assists the infant to adjust to the extra-uterine environment.

In the above mentioned study (Nugent et al., 2006) the NBO was administered to those in the intervention group within two days of their child's birth, and again at home one month later. Researchers concluded that the NBO administration was effective at preventing postnatal depression, and reduced the likelihood of first time mothers with full term babies developing postnatal depression in the first month of their baby's life by more than 75%.

The authors also noted that in addition to enhancing the parent-child relationship, the NBO also allowed the parents to develop a supportive and caring relationship with the administering clinician, which may enhance the parent's sense of worth and reduce feelings of isolation and vulnerability (Nugent et al. 2006; Nugent et al., 2007).

In a study examining the reliability and validity of three self-report bonding questionnaires ($N = 202$), Van Bussel, Spitz and Demyttenaere (2010) concluded that mother-child bonding problems represented a distinct issue and were not just a feature of maternal anxiety or depression. Thus, treatment programs should target mother-child bonding explicitly, as focusing on treating maternal mood would not necessarily result in improvements in the mother-child relationship.

The sensitivity and consistent availability of the mother can influence the security of the attachment between mother and child (Ainsworth, 1979; Nugent et al., 2007). Therefore, it is important to establish whether early parenting program interventions are beneficial to the mother-child relationship, and enhance the mental health of the child (Bowlby, 2012; Schore, 2001).

2.2. Child Temperament

Child temperament is said to be present from birth (Chess, Thomas & Birch, 1980), and although there are different theories on child temperament and ways to measure it, one theory suggests that it contains three major components (Miller, 1999). The first component, positive emotionality, or approach, describes the infant's engagement with the environment and refers to levels of happiness, optimism, enthusiasm and sociability. The second component, negative emotionality or anxiety, describes the infant's level of irritability or fearfulness of the environment. The third component, self-regulation or constraint, refers to the infant's levels of impulsiveness, conscientiousness and patience with his or her

environment (Miller, 1999). Together variations in the above components combine to form the temperament styles of easy, slow to warm up, inhibited, and difficult (Miller, 1999). For example a combination of high anxiety and low approach tends to combine to produce an infant with predominantly negative moods, and he or she would be more likely described as 'difficult'. However, there are other theories that do not include the concept of a 'difficult' temperament, rather, temperament is viewed as dimensional.

Thomas, Chess and Birch (1968) described a difficult temperament as one where infants have irregular eating, sleeping and elimination patterns, and regularly display a negative affect with intense emotional reactions, and initial avoidance of new environments or stimuli followed by slow adaptation. It is thought that approximately 10% of children fit into the difficult temperament category (Chess et al., 1980; Chess & Thomas, 1990).

Parents are often attributed the credit for the smooth socialization and desirable behaviour of their infant. However, the parent-child relationship is not one-sided and the perceived success or failure of parent management is often dependent on both the child's temperament (Chess et al., 1980; Thomas & Chess, 1977, 1989) and maternal efficacy (Johnston & Mash, 1989). Notwithstanding the contribution of the child's temperament, successfully attaining a desirable outcome in infant behaviour increases the parent's self-esteem and enhances the relationship even further by increasing affection, attention and tolerance from the parent (Thomas & Chess, 1989). Conversely, parents, especially mothers, may mistakenly blame themselves when the socialization of a child with a difficult temperament is marred by stress and turmoil, which may lead to feelings of depression (Sugawara, Kitamura, Toda, & Shima, 1999) incompetence, guilt and hostility which may unconsciously be aimed at the child, and hinder the already difficult job of managing the child's temperament (Thomas & Chess, 1977, 1989).

2.2.1. Maternal perception of infant temperament.

Mothers perceive infants with changeable and unstable behaviour, who are fussy and hard to soothe, as having a difficult temperament (Bates, Freeland & Lounsbury, 1979). While maternal reports of child temperament converge moderately with paternal reports and data collected by independent observers (Bates et al., 1979), and parental reports of child behaviour in different situations are accepted as a very valuable source of information (Chess & Thomas, 1990), questions of reliability and validity are raised. Certain maternal characteristics, such as extraversion and multi-parity, have been associated with a mother rating her infant as easy (Bates et al., 1979). Further, maternal depression has been related to a rating of difficult (Edhbor, Seimyr, Lundh, & Widstrom, 2000), as has the presence of infant colic (Thomas & Chess, 1977). However, when Terry, Mayocchi and Hynes (1996) investigated a stress-coping model of postnatal depression they found that the stress of coping with an infant with a difficult temperament was linked to postnatal depression symptoms. As their measure of infant fussiness was from an external source, some clarity was given to the question about the spuriousness of the relationship, suggesting that the rating of the infant's temperament as difficult was not due to the mother's depressed mood.

Porter and Hsu (2003) found that a mother's rating of her infant's temperament was independent of her self-rated maternal efficacy. Further, when compared with her responses on a questionnaire, a mother's ratings of difficult temperamental characteristics were minimized in her verbal report, suggesting that her written responses were less biased toward socially accepted behaviour (Chess & Thomas, 1990).

As mentioned previously, Fisher, Rowe et al. (2004) conducted a study of mother-infant dyads ($N = 117$) who attended an early parenting program at Masada Private Hospital Mother and Baby Unit in Melbourne. The authors considered that infant temperament may be an underlying factor in the development of maternal mood disorders. They reported that

the temperament of the two infant cohorts under investigation were significantly more difficult at admission than population norms. One cohort was followed up one month post attendance, and compared with ratings at admission, they reported statistically significant improvements in maternal mood and infant behaviours ($n = 59$), these gains were sustained at six months ($n = 57$).

The authors, Fisher, Rowe et al. (2004) reported that infant temperament factors such as regulation, irritability, and rhythmic sleep and feeding improved, whilst, manageability, approachability and the global dimension of the infant being generally easy or difficult were more stable. These results suggest that for some, difficult to manage infant behaviours may reflect an underlying difficult infant temperament, and that mothers can be assisted to manage difficult infant behaviour and reduce infant stress by increasing their knowledge and settling repertoire. However, if difficult infant temperament underlies negative maternal mood, one might expect the overrepresentation of infants with a difficult infant temperament to coincide with an overrepresentation of postnatal depression symptoms in the maternal sample; however, this was not the case (Fisher, Rowe et al., 2004).

In line with the expectations of Fisher, Rowe et al. (2004), Dennis and Ross (2005) found that mothers who reported frequent infant crying were more likely to have high depressive symptoms and more likely to have slept poorly or feel fatigued. The authors concluded that infant temperament may be a mediator of the relationship between maternal sleep deprivation and depression.

2.3. Parental Efficacy and Sense of Competence

Parental self-esteem and sense of competence are composed of both satisfaction and efficacy. Reported child behaviour difficulties are directly related to both maternal and paternal satisfaction and efficacy (Johnston & Mash, 1989; Thomas & Chess, 1977, 1989).

Moreover, low levels of efficacy culminate in low levels of parental satisfaction and an overall reduced sense of competence (Johnston & Mash, 1989).

As mentioned previously, the degree to which a mother determines her success or failure as a parent is strongly linked to her sense of maternal competence, and parental self-esteem (Johnston & Mash, 1989). For example, negative emotionality in infants with a difficult temperament, such as irritability and anxiety, has been linked to anxious infant attachment. However, this effect can be circumvented by increased maternal responsiveness (van Den Boom, 1989) which improves the chance the infant will attain the functional goal of felt security. Maternal responsiveness is negatively affected by low maternal efficacy (van Den Boom, 1989) which may have been negatively affected by the infant's difficult temperament (Thomas & Chess, 1977, 1989). Therefore, the problem becomes circular. The mother has an effect on the child's temperamental behaviours and attachment, and the child's temperamental behaviours and attachment have an effect on the way a woman mothers and her level of satisfaction and maternal efficacy, and consequently her sense of competence (Ohan, Leung, & Johnston, 2000; Thomas & Chess, 1989).

The circular effect of the mother-child relationship on the mother's sense of competence may be negative or positive. However, if the effect is negative it may be detrimental to maternal mood, and exacerbate the difficulty of managing the child's behaviour, as the mother will have depleted resources on which to draw when responding to the child's temperamental needs.

2.3.1. Sense of competence as a moderator.

Denis, Ponsin and Callahan (2012) recently investigated the relationships between maternal self-esteem, maternal competence, infant temperament and postpartum or baby 'blues'. With a sample of 69 French participants, their study required mothers to complete measures of the above variables 48 hours after the birth of their child. The authors reported

that the strongest predictor of postpartum blues was the mother's perception of her child having a difficult temperament. They also found that those with low maternal self-esteem scores were more likely to have high postpartum blues scores. Further, the authors found relationships between low maternal self-esteem and a lack of maternal efficacy, and the mother's sense of maternal competence. The authors noted several limitations in their study including the small sample size and the brief time between birth of the child and the completion of the questionnaires. Nevertheless, the authors cautiously concluded that their significant results suggested that maternal self-esteem, or maternal self-efficacy, may play a moderating role between the maternal perception of the infant as having a difficult temperament and the onset of postpartum blues.

With the above taken into consideration, it is necessary for early parenting programs to address all aspects of the complex interactions between child temperament, child behaviours, maternal mood, maternal sense of competence, and mother-infant attachment if they are to improve outcomes for mothers and children. It is expected that the educative component of the Responsive Parenting Program at Tweddle will increase maternal knowledge of the individuality of infant temperament and cues, and increase knowledge of available settling techniques, which in turn may result in an increase in maternal sense of competence and efficacy.

2.4. Maternal and Child Sleep

Relationships have been found between children's sleep quantity and maternal sleep quantity and quality, impaired maternal daytime functioning, maternal negative mood, and parenting stress (Meltzer & Mindall, 2007). Studies of infant sleep problems and infant sleep interventions have found that those reporting child sleep problems are more likely to also report symptoms of maternal depression (Denis et al., 2012; Hiscock & Wake, 2002), family dysfunction (Eckerberg, 2004), unsettled babies, excessive infant crying, and feeding

difficulties (Fisher, Feekery et al., 2004). However, whether the relationship is linear, (that is, increased quantity of child sleep may lead to increased quantity and quality of maternal sleep, which may then improve maternal mood, which may then lead to an improvement in the maternal-child relationship), or cyclical with maternal mood as the catalyst, is unclear (Meltzer & Mindell, 2007).

Armstrong, Haeringen, Dadds, and Cash (1998) queried the accuracy of the diagnosis and treatment of postnatal depression in some mothers of unsettled infants. They suggested that when the quality and quantity of maternal sleep are negatively affected, it may be chronic sleep deprivation which produces a low mood. In their study they concluded that it is necessary to take a holistic approach and consider all aspects of family functioning at assessment, to ensure that mothers do not receive unnecessary, even harmful, treatment. The following studies support the view of Armstrong et al., that it may be futile to treat postnatal depression if the underlying infant sleep problem is not addressed.

Bayer et al. (2007) were interested in the prevalence of infant sleep problems from a maternal perspective. They surveyed English-literate mothers from the urban community of Melbourne, across socio-demographic levels, and found that one third reported sleep problems in children aged three to six months. Reported child sleep problems included frequent night waking, and the need to feed infants to sleep. Those reporting sleep difficulties in this study were more likely to also report maternal mental and physical health problems regardless of their socioeconomic status. They concluded that whilst many health professionals report that frequent night waking is normal in infants and not problematic, 30% of mothers feel that it is problematic.

Whilst Bayer et al. (2007) found that the maternal health problems associated with infant sleep problems were evident from early in the infant's life, Meltzer and Mindall (2007) found that this continues until the child reaches their teens. They investigated the

relationship between child and maternal sleep quality and maternal daytime functioning in families with normally developing children aged three to 14.5 years. Meltzer and Mindall identified a difference between mothers who reported that their child had a significant sleep problem and mothers who did not. Despite both groups reporting the same sleep patterns in their children, including bed time, wake time and total amount of sleep, mothers reporting child sleep problems woke more frequently during the night to care for their child. The authors concluded that mothers whose sleep was frequently disrupted were more likely to perceive that they had poorer sleep quality. Further, they found that disrupted child sleep was also related to poorer family functioning, parental stress, maternal fatigue and daytime sleepiness, and maternal depressive symptoms.

Dennis and Ross (2005) conducted a population based study of 505 Canadian mothers without depressive symptoms at one week postpartum. They found that when their infants were four and eight weeks old, mothers who had developed depressive symptoms reported that their infant cried often, that they were woken up three more times overnight, that they slept less than six hours over a 24 hour period, and that they felt tired significantly more often than mothers who did not develop depressive symptoms. Further, in line with Bayer et al. (2007) and Meltzer and Mindall (2007), mothers reported that it was the frequent infant nighttime waking, along with the total hours of sleep that were the differential variables, rather than the infant's daytime sleep patterns (Dennis & Ross, 2005). Despite the direction of causality being unclear, that is, the mothers who developed depressive symptoms may have viewed their infant's sleep as more troublesome, the authors concluded that for a significant minority of new mothers it was important for preventative infant sleep interventions to be introduced early in the postnatal weeks, as there was a strong association between the onset of new depressive symptoms and infant sleep patterns and maternal fatigue (Dennis & Ross, 2005).

2.4.1. Evidence based sleep interventions.

There is again debate about which approach should be taken when instructing parents about sleep interventions, IBM or IP? Sleep interventions based on the IBM model support the use of practices such as extinction training, controlled crying and controlled comforting in order to train infants to self-soothe and independently sooth themselves to sleep. However, the Australian Association for Infant Mental Health, proponents of the IP approach, released a position paper (2004) on the IBM practice of controlled crying, controlled comforting and sleep training, where comfort for a crying and distressed, not just fussing, infant is delayed for increased periods of time. The paper advised against this practice in all children as it does not meet the psychological and emotional needs of the child. If practiced at all, the association recommended that controlled crying is only appropriate after the child has developed an understanding of the parent's language, and that the parent will return. Further, they stated that the child must be able to feel safe without their parent present. They reported that these skills are generally not developed until the child is approximately three years of age. Their concern was that there may be unintended negative consequences, such as impairment to the parent-child attachment process, as the technique may teach the distressed child not seek or expect support or comfort from their parent. At that time, no studies had reported conducting physiological measures of the stress levels of children who undergo controlled crying, thus, the emotional and physiological impact on the developing child was unknown. However, as discussed previously, Middlemiss et al. (2012) found that children who underwent an extinction method of sleep training had elevated cortisol levels (stress hormones), despite the fact that they no longer exhibited behaviours indicative of distress. These results suggest that the children had only learnt to not cry in order to summon a parent, rather than actually having learnt to self-settle with a feeling of safety and security.

Notwithstanding the above, numerous studies have shown that treating child sleep problems by implementing IBM interventions has resulted in corresponding improvements in maternal and family outcome measures. Sleep interventions may be delivered by primary care givers such as general practitioners and maternal and child health centre nurses, during day stay early parenting programs, so that parents can follow the advice at home, or during the course of a residential early parenting program where parents are supported during nighttime settling.

As previously described Hiscock and Wake (2002) conducted a randomized controlled trial of an IBM graduated exposure infant sleep intervention conducted in the home, controlled crying, with a sample of 156 mothers of infants aged six to twelve months. Prior to beginning the intervention, mothers received information regarding infant sleep patterns and the IBM learned behaviour model regarding sleep and settling during three fortnightly private consultations. The researchers found that at two month follow up the experimental group reported significantly fewer infant sleep problems, and significantly fewer symptoms of postnatal depression. However, this difference was not sustained at four month follow up with the exception of mothers with high depression scores. The authors concluded that the sleep intervention reduced the need for professional sleep services and was a cost effective alternative to other treatments of postnatal depression.

Eckerberg (2004) studied 95 families with children aged 4 to 45 months who took part in a two-step IBM graduated extinction home based sleep intervention. Parents received an hour long consultation prior to the intervention and at two weeks a half hour long follow up consultation, with daily telephone support available in between consultations. The intervention was designed to first teach the children to go to sleep on their own, and then to resettle from night time waking on their own. Results showed that at one and three month follow up, 92% and 94% respectively of participants reported fewer signaled night time

waking events, and improved sleep quality, daytime functioning and family well-being. Further, they found that the most improvement was reportedly in families where children had been rated by their parents as more insecure and anxious prior to the intervention.

Armstrong et al. (1998) studied 114 families with children with a mean age of 19.1 months who attended a Brisbane child sleep clinic to participate in a home based IBM intervention which included controlled crying, 'cold turkey' extinction or rewards techniques. In addition some children were prescribed a two week tapering dose of a sedative. Of interest to the researchers was the association and the causal direction between child sleep problems and maternal distress and depression. The results suggested that as child sleep problems dissipated, maternal mood improved and depressive symptoms decreased. They concluded that the intervention was effective at addressing child sleep problems such as frequent nighttime waking, and time taken to settle at night. Further, they reported that in many cases alleviating child sleep problems was associated with improved maternal mood. However, the authors cautioned against the use of depression screening tools in isolation. They stated that chronic sleep deprivation may produce low mood, which may be confused with post natal depression symptoms. They suggested that it is necessary to also consider childhood behaviour problems, such as sleep disorders, which may lead to chronic sleep deprivation, to ensure that mothers are not mistakenly diagnosed with depression, which could lead to unnecessary or even harmful treatment such as electro-convulsive therapy (Armstrong et al., 1998).

The former residential parenting program conducted at Tweddle in 2002 evaluated by Rowe and Fisher (2010) implemented an IBM based sleep intervention during a four or five night stay of 79 mothers with children under 12 months of age. They found that one month post attendance most parents reported improvement in the length of their child's daytime sleep, and less frequent overnight waking, these improvements were maintained at six

months for most. However, the authors concluded that some of the improvement may have been due to developmental maturation.

There is little evidence of IP early parenting program sleep interventions. This is explained by the fact that IP models place little importance on teaching infants to self-settle to sleep. However, the residential early parenting program conducted at the Queen Elizabeth Centre in Melbourne is based on a model similar to the 'responsive' model under investigation in the current study, and it is more in line with the IP model than with the IBM model. In their evaluation of the Queen Elizabeth Centre program, Treyvaud et al. (2009) found that during a five night residential program 82% of the 44 mothers, with children aged between 3 and 42 months, reported infant sleep problems as their primary concern. At one month follow up participants reported significant improvements in both the occurrence and seriousness of their primary concern.

Whilst the evidence above indicates that there are improved outcomes for parents and families when infant sleep problems are addressed, the unknown psychological and physiological effects on children of IBM extinction techniques such as controlled crying, demands that alternate intervention methods be identified. In their position paper, the Australian Association of Infant Mental Health (2004) suggested that the distress levels of the child should cue the response of the carer, rather than the amount of time that has elapsed since the child was last attended to. Further, it was stated that parents at all times should be encouraged to discontinue any intervention which does not feel right for them or their child.

While opinions differ on which approach, IBM or IP, should be utilised to address child and maternal sleep problems; improving maternal and child sleep quality and quantity undoubtedly improves family functioning. Therefore, examining the effectiveness of the Responsive Parenting Program in addressing sleep problems is deserving of attention in the present study.

2.5. Maternal Mood

Usually a joyful event, having a child leaves approximately 13% of women with clinical depression or anxiety, or both (Dennis, 2005; Driscoll, 2006). Despite regular contact with health professionals, many women may suffer silently, with up to 50% of cases of postnatal depression and anxiety reportedly remaining undiagnosed and therefore untreated (Beck & Gable, 2000; Driscoll, 2006). Further, sub-clinical levels of depression and anxiety may still have a devastating effect on the quality of life for both mother and child (Beeber, 2002; Moehler et al., 2006; Weinberg et al., 2001).

Numerous contributing factors have been identified that are related to the development of postnatal depression and anxiety in mothers. Whilst there is evidence of thyroid dysfunction in some (Harris, 1994), psychological rather than biological factors have been implicated in most cases (Cooper & Murray, 1998). Factors previously identified include a psychiatric history, particularly depression and anxiety (Adewuya & Afolabi, 2005), the presence of maternity blues, stressful life events, marital conflict, complications during the birth of the child, and an absence or lack of social and familial support (Cooper & Murray, 1998; Driscoll, 2006). Postnatal anxiety is said to be more prevalent than postnatal depression in the first four weeks postpartum, while postnatal depression is more prevalent between eight and twelve weeks (Adewuya & Afolabi, 2005; Matthey, 2004; Matthey, Barnett, Howie & Kavanagh, 2003). The recommended treatment of postnatal depression is a combination of psychosocial interventions including psychotherapy and anti-depressants (even in breast feeding mothers if the depression is severe). In some severe cases electro-convulsive therapy is used (Driscoll, 2006).

2.5.1. Maternal mood and outcomes for children.

The relationship between maternal mental health and child outcomes has been well established. For instance, untreated postnatal depression may lead to impaired cognitive

development (Cooper & Murray, 1998), impaired language development, and behaviour problems (Driscoll, 2006) in offspring. Furthermore, mothers with postnatal depression tend to have a negative perception of their child's behaviour (Dennis, 2005; Meredith & Noller, 2003), and mother-infant attachment and bonding can be negatively affected (Cooper & Murray, 1998; Moehler et al, 2006). The following studies demonstrate that the negative effects of maternal depression include impairments in the mother-child relationship and an increased risk of mental health problems in offspring.

A 20 year follow up study ($N = 151$) examined the magnitude and continuity of risk of children developing a psychiatric problem if one or both of their parents developed a psychiatric problem during their childhood (Weissman et al., 2006). The sample, now adults with a mean age of 35 years, was comprised of children of moderately to severely depressed and non-depressed parents, who did not have a psychiatric history prior to their child's birth. The authors found that the risk for the children of the depressed parents developing an anxiety or depressive disorder, or substance dependence, was approximately three times higher than for the children of non-depressed parents. Further, children of depressed parents were more likely to have social impairment, medical problems, and a higher rate of mortality. They also found that anxiety disorders were more likely to emerge between the age of five and fifteen in children with at least one parent with Major Depressive Disorder. Further, depression onset was more likely to occur between the ages of 15 and 25 years, with females in this age group being the most affected (Weissman et al., 2006). The authors concluded that the children of depressed parents are at increased risk of developing a mental illness, they recommended early detection screening.

Forman et al. (2007), conducted a randomised controlled study ($N = 176$) to investigate whether treating postnatal depression with interpersonal therapy improved outcomes for children of depressed mothers. They compared the treatment group with a

waitlist group and a non-depressed group on outcomes such as parenting stress, attachment, temperament, and child-behaviour problems. The authors found that after treatment, depressed mothers improved significantly on parenting stress, but still scored higher than non-depressed mothers. Eighteen months after treatment the depressed mothers rated their children as significantly lower in secure attachment, reported more behaviour problems, and reported that their children displayed a more negative temperament than non-depressed mothers. The overall conclusion was that improving maternal depressive symptoms did not automatically improve child outcomes and therefore treatments should also target the mother-child relationship (Forman et al., 2007).

In a community study of 101 mothers, Moehler et al. (2006) found that for infants less than fourteen months of age, maternal depressive symptoms were strongly associated with lower quality maternal bonding. Further, there was a particularly negative impact on bonding if the child was less than four months of age. These results suggest that even undiagnosed maternal depression can impact mother-child bonding.

Meredith and Noller (2003) investigated the relationship between postnatal depression and maternal attachment style in a sample of 72 mothers recruited in three different ways: 1) When admitted to a maternal residential unit in Brisbane; 2) Response to an advertisement for new parents; 3) Contacted through an antenatal clinic at a maternity hospital. They found that depressed mothers were more likely to report a history of depression, unplanned pregnancy, poorer child health, lower income, and that their child for whom they were participating in the study was not their first born. With regard to maternal attachment style, the depressed group was significantly more insecure and preoccupied (Meredith & Noller, 2003). Further, they found that the depressed group was more likely to describe their child as dull, fussy, unadaptable, and unpredictable than the non-depressed group. Mothers with depression also reported that they were more rejecting, neglectful, and

aggressive towards their children. There were no differences in marriage quality. As expected, the cohort from the residential unit had higher levels of postnatal depression than the community cohorts (Merideth & Noller, 2003).

The results of a study by Walker, Davis, Al-Sahab and Tamim (2013) suggest that the relationship between postnatal depression and child behavioural and emotional outcomes is not simple. They analysed data from a longitudinal study of children whose mothers reported having postnatal depression in the first year after their birth, at two time points, when the child was aged two to three years, and when the child was aged four to five years. They concluded that the relationship may in fact be mediated by other factors such as parenting style. This conclusion supports the suggestion by Armstrong et al. (1998) and Dennis and Ross (2005), as discussed previously, that all contributing factors to maternal mood must be considered as maternal sleep deprivation and infant temperament may also mediate or moderate the relationship between infant sleep problems and postnatal depression symptoms.

2.6. Rationale for the current study

The current research focus on residential early parenting programs being utilised to improve maternal mood is justified as postnatal mood disorders are prevalent in Australia, and residential early parenting interventions have been shown to improve maternal depressive symptoms (Hiscock & Wake, 2002; Rowe & Fisher, 2010). Furthermore, the effects of postnatal mood disorders are trans-generational, and constitute a significant public health problem. The reported figure that approximately 13% of mothers experiencing a clinically significant postnatal mood disorder (Dennis, 2005; Driscoll, 2006) is likely to be an underestimation as many women do not seek help, resulting in up to 50% of cases remaining undiagnosed and untreated (Beck & Gable, 2000; Driscoll, 2006). Attendance at an early parenting program allows some of those mothers to receive support that they might

otherwise not receive. However, as improvements to maternal mood do not necessarily equate to improvements in mother-child attachment (Forman et al., 2007; van Bussel et al., 2010) research is required to directly assess child-focused outcomes such as maternal sensitivity to infant cues, mother-child bonding and infant temperament, such research is currently limited.

It is also important to examine the inter-relationship between maternal and child outcomes (Poobalan et al., 2007), as it is possible that improvements in mother-child relationships and reported infant behaviours are perceived as a result of improved maternal mood, rather than a direct result of the program improving outcomes in these areas. Therefore, in order to assess the efficacy of the responsive residential early parenting program conducted at Tweddle over three to four days and nights, irrespective of changes in maternal mood, this study will control for the effect of improved maternal depressive symptoms on the child-focused outcome variables to establish whether maternal and child benefits are independent of each other.

Furthermore, current debate exists in the literature regarding the approach that should be taken to assist parents of unsettled infants (Fisher, Rowe, Hiscock et al., 2011). Infant Behavioural Management (IBM) and Intuitive Parenting (IP) are at opposite ends of the spectrum and whilst IBM places emphasis on infant independence regarding sleep and settling, and maternal mood outcomes, IP places emphasis on improving the mother-child relationship, infant-maternal proximity and facilitating felt security in the child (Fisher, Rowe, Hiscock et al., 2011). Therefore, based on the literature review above, this project will extend the current body of knowledge of outcomes of early parenting programs by investigating whether the 'child-focused' residential responsive parenting program conducted by Tweddle is beneficial for both mother and child, irrespective of changes in maternal mood, and whether results remain consistent over time. These results will then be discussed in relation to the results of prior studies of both IBM (Rowe & Fisher, 2010) and IP early

parenting programs (Treyvaud et al., 2009) to assess the efficacy of the previously unevaluated, revised 'responsive' Tweddle program which is now more in line with the IP approach than the preceding version of the Tweddle program. However, due to the design of this study, it will not be possible to conclude which of the approaches, IBM or IP, is more effective.

2.7. General Aims and Hypotheses

2.7.1. Aims.

The first aim of this study is to assess whether a 'child focused' intervention implemented during a three to four night Residential Responsive Early Parenting Program at Tweddle improves outcomes for mothers and children by improving maternal perception of mother-child bonding; improving the way a mother perceives her child's temperament; improving maternal mood; increasing the amount of maternal sleep; increasing the amount of child sleep; and improving maternal sense of competence. Further, the current study aims to establish whether improvements are sustained at follow up.

The first aim will be addressed in a primary analysis of all participants who complete questionnaires at all three time points. Data will be collected prior to participant's attendance at the program; approximately one week after completion of the program; and at follow up approximately eight weeks post-program attendance.

The second aim of this study is to ascertain whether maternal mood interacts with the remaining outcome variables of interest listed above. To address this, and also to determine whether changes in the remaining variables are independent of maternal mood, the effect of maternal mood will be controlled in a second analysis of the pre-program attendance and post-program attendance data.

2.7.2. Hypotheses.

The following hypotheses will be addressed. It is expected that after completion of the Responsive Parenting Program:

- H1. Maternal mood, maternal perception of mother-child bonding, maternal perception of child temperament, amount of maternal and child sleep, and maternal sense of competence will improve from pre-program attendance to post-program attendance.
- H2. Improvements in maternal mood, maternal perception of mother-child bonding, maternal perception of child temperament, amount of maternal and child sleep, and maternal sense of competence will be sustained at follow up, approximately eight weeks post program completion.
- H3. When the effect of maternal mood is held constant, there will be post program improvements in maternal perception of mother-child bonding, maternal perception of child temperament, amount of maternal and child sleep, and maternal sense of competence.

Chapter 3. Method

3.1. Introduction

This chapter begins by presenting a description of the setting and the residential three to four night Responsive Parenting Program intervention conducted at Tweddle Child and Family Health Services (Tweddle). The research design is then discussed, followed by sample recruitment and the characteristics of the participants. The measures used to operationalize the concepts under investigation are then presented followed by the study procedure. Response rates and a priori power are followed by a discussion of the ethical considerations of the study. The final section outlines the methods used for analyzing the data.

3.2. Setting and program

3.2.1. Description of the program.

Tweddle is a not-for-profit early parenting centre and accredited health organisation based in Melbourne, Victoria, where a three to four day and night residential Responsive Parenting Program is conducted to assist approximately 630 families per annum to manage early parenting problems. The Tweddle program has changed and developed somewhat over its years of operation. The 2012-2013 version of the program is based on the Keys to Caregiving program (Spietz et al., 1990) and has been designed to enhance perception of child behaviour, support parents whilst teaching them how to understand their child's cues and to respond to the individual needs of their child. On the IP – IBM continuum, the child-focused program is more in line with IP.

The program has 4 phases; exploration, confidence building, skill consolidation, and preparation for home. Program information sessions cover infant states, infant behaviour, infant cues, state modulation, and feeding, as well as sleep and settling strategies. In

addition, programs aim to improve parental adjustment to life after having a baby, improve parental responsiveness to child cues, increase parent-child interaction, and increase parental responsiveness to assist their child to regulate their emotions. Emphasis is placed on the relationship between the parents and the child, and more specifically mother-child bonding. Participants provide demographic information and complete the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden & Sagovsky, 1987) on the first day of admission.

3.2.2. Tweddle team.

The multidisciplinary team at Tweddle includes psychologists, social workers, registered nurses and early childhood professionals, who work with families to improve maternal fatigue and feelings of anger and depression, and improve parental competence. The team conducts individual and group work with the family during the program.

3.2.3. Procedure.

At the time of this study (2013), attendees were able to self-refer to the program; however, 53 per cent were referred by a general practitioner, psychologist or counsellor. Currently (in 2014), all attendees require a professional referral to the service. This procedure change was implemented to ensure that mothers have a support network in place after their attendance at the program (Tweddle, 2014).

During the period of data collection there were no procedures in place for Tweddle staff to contact attendees after they completed the program. However, Tweddle offers a range of support services such as individual short-term psychotherapy with psychologists, and a social support program which attendees are invited to utilise after the program. Between July 2012 and June 2013 Tweddle provided interventions or referrals to 46 per cent of program attendees (Tweddle, 2013).

3.3. Research design

The current study employed a prospective cohort study design without a control group. The study proceeded as planned and all mothers who registered to attend the Responsive Parenting Program within a 12 month period, who met the criteria of the study, were invited to participate. There were three data collection points: prior to attending the program (T1); after completing the program (T2); and at 8-week follow-up (T3).

3.4. Sample recruitment and characteristics

3.4.1. Sample recruitment and assessment for eligibility.

Participants were recruited as a consecutive sample from all mothers scheduled to attend the three - four night Responsive Parenting Program at Tweddle who were over the age of 18 years, with sufficient English skills to understand and complete the written questionnaire (Appendix A), and who were attending the program with a child aged 18 months or less. The recruitment and data collection period extended from the beginning of November, 2012 until the end of October, 2013.

During the standard intake phone call to attendees, Tweddle intake staff identified mothers who met the criteria, informed them of the study, invited them to participate and requested permission to send them the study information. Tweddle intake workers were provided with the following prepared statement to use during the intake call:

‘I would like to invite you to participate in a study being conducted by researchers from Victoria University. They are exploring whether mothers feel differently about themselves and their relationship with their child, after they attend the responsive parenting program you will be attending. I am seeking your permission to send you the questionnaire and some information about the research. You can then read it and decide whether you would like to participate. I will not be informed of

whether you decide to participate, and your decision will not affect your place in the Responsive Parenting Program. If you choose to participate, please complete the questionnaire prior to attending the program and return it and the signed consent form directly to the researchers in the reply paid envelope supplied. Is it alright for me to send you the research information?'

Attendees who consented to receive the research information were sent a questionnaire pack along with the standard information mailed to them by Tweddle prior to their attendance. The questionnaire pack included a ten page questionnaire (Appendix A), a plain language information sheet (Appendix B) explaining the purpose of the study, and a consent form (Appendix C) which requested the date the participant was scheduled to attend the program and their contact details for post-program attendance follow up.

3.4.2. Sample characteristics.

During the 12-month period 300 questionnaires were distributed and recruitment yielded 42 mothers aged between 20 and 43 years with a median age of 33.5 years ($M = 32.6$, $SD = 5.24$), who were attending the program for a child aged between three and 18 months with a median age of 10 months ($M = 9.6$, $SD = .59$). There were 17 male children (40.5%) and 25 female children (59.5%) in the sample and all were single births. Mothers reported that they were predominantly born in Australia (78%), married (67%) or de facto (21%) and were primiparous (64%) with 26 per cent having two children and 10 per cent having three, and that they currently lived in the urban area of Melbourne and surrounding suburbs (62%). The majority of mothers had a tertiary education (73%) with 12.5 per cent having studied at a TAFE level and 60 per cent having a university degree; 31 per cent reported that they were currently employed either part or fulltime, with four per cent working from home. A large proportion of mothers (57%) had a history of anxiety, depression or another mental health

problem and 31 per cent had received counselling since the child for which they were attending the program was born.

The 2012-2013 (Tweddle, 2013) annual report indicated that on admission to the program 89 per cent of attendees reported being exhausted, 57 per cent reported anxiety symptoms, 43 per cent reported adjustment difficulties, and 36 per cent reported that they were experiencing relationship issues. Furthermore, in that 12 month period 541 mothers were screened at admission using the EPDS. It was reported that 46 per cent of mothers scored in the clinical range (total score > 12) and 17 per cent endorsed the self-harm item (item 10) of the scale. In the current sample, a comparable 45 per cent of respondents scored in the clinical range on pre-program scale, and 24 per cent endorsed the self-harm item.

Of the mothers in the residential program who were offered a followed up assessment over the 2012-2013 period, 25 per cent had an Edinburgh Postnatal Depression Scale score in the clinical range and seven per cent endorsed the self-harm item (Tweddle, 2013). In the present sample 17 per cent of post-program respondents scored more than 12, and eight per cent endorsed the self-harm item. Further, at two month follow up eight per cent of retained participants scored more than 12 on the scale and sixteen per cent endorsed the self-harm item.

In their 2002 study of a previous Tweddle residential program, Rowe and Fisher (2010) found comparable results on the Edinburgh postnatal depressions scale. They reported that on admission 39 per cent of attendees scored greater than 12 on the scale. Furthermore, at one month post-attendance 18 per cent reported scores in the clinical range, and at six month follow up 12 per cent reported scores in the clinical range.

With regard to the child for whom they had been referred to the program, mothers reported that the pregnancy was planned 83 per cent of the time, with no mothers reporting

that the pregnancy was unwanted. Delivery was predominately vaginal (62%) with 81% of babies born full term (>37 weeks gestation) and almost half of mothers (48%) were currently breastfeeding their child. Many participants experienced moderate to severe complications during the pregnancy (43%) and delivery (60%) of the child for whom they were attending the program, and 50% experienced moderate to severe complications breastfeeding. Twenty four per cent of mothers reported that their child had moderate to severe health problems at the time of their birth, and 19% reported that their child had moderate to severe health problems at the time of completing the questionnaire.

3.5. Measures

Whether referred by a professional or not, it is maternal perception of difficulties which motivates attendance at parenting programs. A questionnaire measuring maternal perception was used to measure child and maternal variables in this study, as it was the change in maternal perception of these variables after attendance at the program that was of primary interest. This method also provided an estimate of outcomes for children.

Observational methods could have added another dimension to the study in terms of looking directly at mother-child functioning, however, this was beyond the limited resources of the study.

The ten page questionnaire (Appendix A) that participants were asked to complete was comprised of demographic questions regarding maternal age, child's age and sex, number of children, education level, postcode and country of origin, marital and working status, antenatal mental health problems, and general information regarding the woman's pregnancy and delivery of her child, status of the child's medical problems, and current feeding method. The demographic information is discussed in detail in the sample characteristics section above. The questionnaire also included the self-report measures presented below.

3.5.1. Measure of maternal sleep quantity.

A single-item maternal report of the quantity of maternal sleep using a 7 point likert scale was included in the questionnaire. Participants were asked, 'Thinking about the past three days, what is the average amount of sleep you got in a 24 hour period?' Possible responses were: 1 = 0-4hrs, 2 = 4-5hrs, 3 = 5-6hrs, 4 = 6-7hrs, 5 = 7-8hrs, 6 = 9-12hrs, and 7 = 12-14+hrs. This single item was designed by the researcher for the purpose of the study, thus, no validity or reliability information is available.

3.5.2. Measure of child sleep quantity.

The questionnaire also included a single-item maternal report of the quantity of child sleep using a 7 point likert scale. Participants were asked, 'Thinking about the past three days, what is the average amount of sleep the child for whom you attended the program got in a 24 hour period?' Possible responses were: 1 = 0-4hrs, 2 = 4-5hrs, 3 = 5-6hrs, 4 = 6-7hrs, 5 = 7-8hrs, 6 = 9-12hrs, and 7 = 12-14+hrs. This single item was designed by the researcher for the purpose of the study, thus, no validity or reliability information is available.

3.5.3. Maternal perception of mother-child bonding.

Maternal perception of mother-child bonding was measured using the Postpartum Bonding Questionnaire (PBQ; Brockington et al., 2001), which is a 25-item self-report scale that measures maternal ratings of statements reflecting affective and cognitive aspects of the mother-to-infant bond on a 6 point likert scale (1 = always to 6 = never). The scale includes four subscales; impaired bonding; rejection and anger; anxiety about care; and risk of abuse. In the present study the total score of the PBQ was utilized, which was made up of the sum of the 25 items. Adequate test-retest reliabilities have been reported for the PBQ (Brockington et al., 2001). The total score PBQ's internal consistency has been reported at 0.79 (Wittkowski, Williams, & Wieck, 2010). Similar results were found in a study examining the

Dutch version of the PBQ (van Bussel et al., 2010) in a Belgium sample ($\alpha = .87$ & $\alpha = .78$).

The internal consistency of the PBQ, calculated on T1 data, in the current study was $\alpha = .89$.

Sample items for the PBQ include 'the baby does not seem to be mine', 'my baby winds me up', 'my baby irritates me', and 'I feel happy when my baby smiles or laughs'.

Items 1, 4, 9, 10, 11, 16, 22 and 25 were reverse scored so that a high total score reflected an optimal mother-to-infant bond.

3.5.4. Maternal perception of child temperament.

Maternal perception of child temperament was measured by the Infant Characteristic Questionnaire (ICQ; Bates et al., 1979) which comprises 24 self-report items measuring a parent's perception of four factors using a 7 point likert scale. The four factors are: fussy – difficult, items 1, 5, 6, 13, 22 and 24, ($\alpha = .79$); unadaptable, items 9, 10, 11 and 20, ($\alpha = .75$); dull, items 16, 23 and 15 (reversed), ($\alpha = .39$); unpredictable, items 2, 3 and 4, ($\alpha = .50$). Items 8, 16 and 18 were unsuitable for children less than four months of age and were not used. More recently, four experimental items have been added to the scale (J. E. Bates, personal communication, April 3, 2007) and were used in this study (new items 8, 16, 18 and 25). Therefore, the remaining 21 original items and the four experimental items were added together to form a total score, which was used as an indication of the overall temperament of the child as together the factors included gave a general idea of how high need, or difficult to manage, the child was and how many changes the mother may have had to make in order to accommodate the child's temperamental needs.

When subscales are used, item 15 is reversed in order that a high score indicates the child is quiet and calm. However, in using the total score, item 15 was not reversed in the present study as it was more appropriate that a high score reflect an active and vigorous child, which is thought to be more difficult to manage (Bates et al., 1979). A high score on the ICQ

indicates that the child is generally high need, or has a difficult temperament. Sample ICQ items are 'how many times per day, on the average, does your baby get fussy and irritable—for either short or long periods of time', 'how much does your baby cry and fuss in general', 'how did your baby respond to his/her first bath', and 'how does your child typically respond to a new person'. Adequate levels of internal consistency and test-retest have been reported for the ICQ (Bates et al., 1979), along with reliabilities of $\alpha = .90$ for mothers and $\alpha = .81$ for partners (Terry et al., 1996). In the current study, the Cronbach alpha coefficient calculated on T1 data was $\alpha = .85$.

3.5.5. Maternal mood.

Maternal mood was measured by the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987), a 10-item self-report scale measuring postnatal depression on a 4 point likert scale (0 to 3). Scores greater than 12 on the EPDS are thought to indicate the presence of a depressive illness, such as postnatal depression. Additional screening is warranted if the total score is greater than 10 in primary care communities (Cox et al., 1987).

Participants are directed to rate how they have felt over the past seven days in response to questions concerning anxiety, mood and suicidal ideation. Items include 'I have looked forward with enjoyment to things', 'I have blamed myself unnecessarily when things went wrong', 'I have been anxious or worried for no good reason' and 'I have felt scared or panicky for no very good reason'. Items 3, 5, 6, 7, 8, 9 and 10 are reverse scored.

The scale has been validated internationally and has acceptable test-retest, sensitivity and specificity as a screening tool and it is sensitive to changes in depression severity over time (Cox et al. 1987). According to Andrews-Horowitz, Murphy, Gregory and Wojcik (2011) the EPDS has good internal consistency with a reported Cronbach alpha co-efficient of .80. In the current sample, the Cronbach alpha calculated on T1 data was $\alpha = .85$.

3.5.6. Maternal sense of competence.

Maternal sense of competence was measured using the Parenting Sense of Competence Scale (PSOC) (Johnston & Mash, 1989) which is a 17 item questionnaire that assesses parenting self-esteem on two subscales, satisfaction and efficacy. Items are rated on a 6 point likert scale ranging from (1) strongly agree to (6) strongly disagree. Items 1, 6, 7, 10, 11, 13, 15 and 17 are reverse scored, so that a higher score indicates greater parenting self-esteem. Sample items include 'my mother/father was better prepared to be a good mother/father than I am', 'a difficult problem in being a parent is not knowing whether you're doing a good job or bad one', and 'sometimes I feel like I'm not getting anything done'. The PSOC total score was used in the current study and items were coded so that a high score indicated a high sense of competence.

Internal reliability has been reported as $\alpha = .75$ for the satisfaction subscale, and $\alpha = .73$ for the efficacy subscale (Johnston & Mash, 1989). Ohan et al. (2000) reported Cronbach α for each of the subscales as .80 in a sample of mothers of five to twelve year old children. The internal consistency of the PSOC total score calculated on T1 data in the current sample was $\alpha = .88$. Test-retest reliability coefficients have been reported as ranging from .46 to .82, over a six week period (Ohan et al., 2000).

3.6. Study procedure

Program attendees who consented to being sent the study information received an information sheet (Appendix B), a consent form (Appendix C) and the 10 page questionnaire (Appendix A) comprised of demographic questions, maternal and child sleep quantity items, and the four standardized, valid, reliable and published psychometric measures of maternal mood, maternal sense of competence, and maternal perception of mother-child bonding and

child temperament, outlined in detail in the Measures section (3.5.). It was estimated that the questionnaire would take 10 -15 minutes to complete.

Participants returned completed questionnaires prior to attending the program, time one (T1), together with the completed consent form. The consent form contained an option for participants to elect to have post-program, time two (T2), and follow up, time three (T3), questionnaires mailed to their postal address, or alternatively, to supply their phone number and be contacted to complete the questionnaire during a phone interview at a mutually suitable time.

The rationale for attendees to complete the pre-program questionnaire prior to admission was to capture the general opinions of the participant in their home environment, and for them to complete the questionnaire at a time of their own choosing, as it was possible that responses at admission would capture emotions related to being in a new environment. Further, it was thought that this procedure would reduce the burden for the participant of having to complete the Tweddle admission forms and screening questionnaires as well as the research questionnaire and consent form.

Participants were sent the questionnaires in a timely fashion so that they could complete them one week after completing the program, and again at follow up eight weeks after completion of the program. One participant elected to complete her T2 questionnaire during a phone interview, however, due to her subsequent return to work the participant elected to have the T3 questionnaire mailed to her for completion, thus, only one telephone interview was conducted.

3.6.1. Masking.

As the intake workers were not involved with the delivery of the program, nor were they involved with the collection of the research data, they were unbiased and well placed to

inform attendees of the research and request permission to send the research questionnaire pack. This method ensured that Tweddle program facilitators were blind as to which attendees participated in the research. Further, the facilitators and administrators of the program did not contribute to the study design, nor did they have any influence over the outcomes. Moreover, the investigator did not participate in the administration or facilitation of the program, and thus could not influence the delivery of the program.

Participants' completed questionnaires were coded, and stored separately to contact information in a locked filing cabinet. The data file containing questionnaire responses was password protected and participants were identified only by their coded ID number. However, it was possible for the researcher to identify individual responses if the raw data ID number was matched to the ID number on the consent form.

3.7. Ethical Considerations

3.7.1. Research ethics approval

Ethics approval was obtained from the Victoria University Human Research Ethics Committee (HRETH 12/96; Appendix D) prior to the collection of any data. Further, approval was granted by the Tweddle Child and Family Health Service Committee (Appendix E).

Participation in the research was voluntary and participants were informed that they could withdraw at any time. Informed consent was obtained in conjunction with participant contact details, and clients were encouraged not to place identifying marks on the questionnaire so that responses were not readily identifiable. Clients were informed that their contact details and questionnaire responses would be stored separately, and computer files would be password protected and accessible only by the researchers. The data will be stored for a period of five years after publication, and then destroyed. Only pooled group

information will be used in any reports or publications, and individual responses will not be identifiable.

3.7.2. Protecting the participants.

Whilst participants were choosing to attend the program regardless of participating in the research, the population that the participant pool was drawn from was vulnerable as they were attending the program for help with sleep and settling difficulties with their child. It was highly probable that they were already feeling distressed, overwhelmed, angry, anxious and, or, depressed. The questionnaire contained questions regarding the mother's mental health and current feelings about her child, thus, it was possible that completion of the questionnaire may have exacerbated the feelings mentioned above. However, notwithstanding the above, approximately 6% of mother infant dyads in Victoria are admitted to specialist psychiatric and residential early parenting services in a twelve-month period (Fisher, Rowe & Hammarberg, 2011), and therefore, it is very important to establish the efficacy of the programs offered. Thus, in order to offer greater protection to the participants, measures were taken to provide support if an adverse event were to happen.

The consent form included the following opening paragraph:

'We would like to invite you to be a part of a study into the effect of a Responsive Parenting Program on the way a mother feels about herself and her relationship with her child. After completing the self-report questionnaires you may wish to talk to someone about how you feel. Please see the attached information sheet for the contact details of available services.'

The information sheet contained the following statement:

'Completion of the questionnaire may alert you to changes in the way that you feel about yourself and your relationship with your child. You are encouraged to seek support from the providers listed below to discuss any concerns that may arise'.

Participants seeking support were direct to contact Clinical Psychologist, Dr Glen Hosking at Victoria University, the Victoria University Psychology Clinic (free counselling), Beyond Blue, or to contact LIFELINE for immediate, 24 hour, anonymous support. Contact details for these services were also provided.

3.7.3. The identification of a client in distress

During analysis, an outlier was identified in the group who completed only the pre-program questionnaire. As the participant returned only time one data, her responses were not included in the analyses. The participant had scored very low on the mother-child bonding variable. On investigation of the original data, to ensure that it had not been entered incorrectly, it was noted that the participant had identified that she almost always felt negative feelings toward her child and regretted having the child, and that she had thought of hurting herself quite often as indicated on the EPDS. The participant had indicated that she was due to attend the program in September 2013, four months prior to the data being analyzed.

Despite the amount of time which had lapsed, the researcher was not comfortable with the level of risk to mother and child indicated by the mother's responses. Further, a similar concern had been identified in a previous study of a Tweddle program (Fisher & Rowe, 2004) and the researchers contacted Tweddle to ensure that the identified participant was contacted and encouraged to seek support from professional services. Thus, contact was

made with the Director of Clinical Services/ Director of Nursing at Tweddle, and the name and address of the participant was revealed.

Upon Tweddle checking the EPDS completed by that participant at admission to the program, responses were found to be inconsistent with the research responses, the participant had not indicated that she had thoughts of harming herself, nor that she was experiencing severe distress. After discussion, it was determined that appropriate support information had been provided to the participant in the information sheet with the questionnaire for her to seek support if she had felt distressed at the time of completion. Further, given the amount of time which had lapsed since completion of the questionnaire, and that she had subsequently completed the Tweddle program, no further action was taken.

3.8. Sample size and power

3.8.1. Response rates

The response rate of 17.7% (N = 53) in this study was extremely low when compared with other studies of mother-baby units and early parenting programs. Fisher, Feekery and Rowe-Murray (2002) reported a response rate of 75 per cent, and Rowe & Fisher (2010) reported a rate of 62 per cent. However, both of the cited studies recruited participants and distributed questionnaires to attendees during their admission to the program. This may have increased participants' sense of obligation to participate in the studies. Further, attendees may have had more available time to complete the questionnaires as they would not have had to complete their normal home duties while at the program.

The rate in this study was further reduced as six participants returned completed pre-program questionnaires without the consent form, without which the T2 and T3 questionnaires could not be sent. Further, one pre-program questionnaire was returned uncompleted, and three pre-program questionnaires were received after the closing date for

data collection, which meant the post-program questionnaires could not be completed and returned before analysis commenced. Finally, one participant indicated that she had decided not to attend the program at Tweddle after she had returned the pre-program questionnaire. Thus, eleven participants were excluded from the study resulting in an overall sample size of 42 participants, 14% of the total number of questionnaires distributed.

Of the 42 participants who completed the T1 questionnaire and consent form 24 (57%) completed and returned the T2 questionnaires, and of that group 12 (50%) completed and returned the T3 questionnaires. Therefore the study yielded a retention rate of 29% over the three time periods. This retention rate is extremely low when compared with Rowe and Fisher (2010) who reported a post-program retention rate of 84 per cent, and a follow up retention rate of 73 per cent in a similar study of a residential program offered at Tweddle in 2002. It is possible that the participants in these studies felt an increased obligation to return questionnaires due to their recruitment taking place during admission where they personally spoke to the researcher.

3.8.2. Power - a priori.

An a priori sample size analysis for a Repeated measures, within factors MANOVA was conducted using the GPower 3.1 program (Faul, Erdfelder, Buchner & Lang, 2009). With the parameters $ES = .15$ (moderate effect), $\alpha = .05$, and $1 - \beta = .80$ and the number of groups set at $n = 3$, number of measurements set at $n = 6$, and the correlations among measures set at $r = .5$, the indicated minimum required sample size was $n = 54$. This minimum sample size was not achieved; however, obtaining the required power to detect statistically significant results could still be achieved with a smaller sample if the obtained effect size exceeded $ES = .15$, the estimate used in the a priori power analysis (Tabachnick & Fidell, 2013).

3.9. Methods of Data Analysis

All analyses were completed using IBM SPSS Statistics for Windows, Version 22.0 (2012). The data were screened for errors, missing data, and outliers before analysis was undertaken. All returned questionnaires were fully completed with the exception of four responses, one each to the demographic questions regarding country of birth, and level of education, and two participants did not indicate whether they had received counselling since the birth of their child.

As two main analyses were undertaken with two different subsets of the overall sample, the assumptions and procedures for each are discussed separately. The results of each analysis are also discussed separately in the Results chapter.

To address the first and second hypotheses, that maternal mood, maternal perception of mother-child bonding, maternal perception of child temperament, amount of maternal and child sleep, and maternal sense of competence would improve from pre-program attendance to post-program attendance, and that improvements would be sustained at follow up, a One Way Repeated Measures Multivariate Analysis of Variance (RM-MANOVA) was used to analyse the responses of the twelve participants who were retained for the duration of the study at three time periods.

To address the third hypothesis, that with the effect of maternal mood held constant, there would be post program improvements in maternal perception of mother-child bonding, maternal perception of child temperament, amount of maternal and child sleep, and maternal sense of competence. A One Way Repeated Measures Multivariate Analysis of Co-Variance (RM-MANCOVA) was conducted with the changes in maternal mood from pre to post-program as a covariate. To maximise the power of this analysis the subsample for this analysis was comprised of the twenty four participants who returned questionnaires pre and post-program attendance.

As different subsamples were used in each analysis, a Bonferroni adjustment was not undertaken to adjust the Type I error rate (Tabachnick & Fidell, 2013). As the direction of relationships could be predicted one tailed significance tests were used.

Chapter 4. Results

4.1 Introduction

This chapter presents correlations and descriptive statistics of the baseline data for all participants, the results of two analyses conducted to answer the three research questions, the issue of attrition is then examined. The first analysis was a Repeated Measures Multivariate Analysis of Variance (RM-MANOVA) to address research questions one and two. The second analysis, a Repeated Measures Multivariate Analysis of Covariance (RM-MANCOVA), addressed the third research question.

The final section of this chapter is dedicated to examining the attrition rates of the study. The section examines baseline data for the samples used in the two main analyses (i.e. those who completed the second and third waves of data collection) and compares this to the data for those who only participated at baseline. The aim was to assess whether samples used in the analyses were representative of the initial sample.

4.2. Descriptive statistics and correlations of the baseline data.

The means and standard deviations for all participants can be seen in Table 4.2.1. As can be seen in the table the standard deviations for the maternal mood and maternal perception of infant temperament variables are quite large, suggesting that there was a great deal of variation between the minimum and maximum scores obtained on these variables.

Table 4.2.1.

Means and standard deviations for baseline data for all participants

Dependent Variable	T1 (<i>n</i> = 42)	
	<i>M</i>	<i>SD</i>
Hours of maternal sleep	6.4	1.6
Hours of child sleep	9.2	1.8
Mood	11.8	5.4
Bonding	131.2	11.2
Temperament	99.8	17.8
Competence	67.0	11.9

Table 4.2.2. displays the correlations between the outcome variables for all participants at baseline ($n = 42$), collected prior to attendance at the residential responsive parenting program. Although the results are in the low to medium range (Pallant, 2010), many of the variables are correlated at the $p = .01$ and $p = .05$ levels.

Table 4.2.2.

Correlation matrix for baseline responses for all participants

Dependent Variable	1	2	3	4	5
1. Hours of maternal sleep					
2. Hours of child sleep	.38*				
3. Mood	-.22	-.37*			
4. Bonding	.34*	.29	-.52**		
5. Temperament	-.15	-.10	.24	-.43**	
6. Competence	.27	.05	-.47**	.63**	-.54**

** Correlation is significant at the .01 level (2-tailed)

* Correlation is significant at the .05 level (2-tailed)

4.3. Research Questions One and Two: Outcomes post-program and at follow up.

An RM-MANOVA was conducted to assess whether participants' scores on the outcome measures of maternal mood, maternal perception of mother-child bonding and infant temperament, maternal sense of competence, and hours of sleep for mother and child improved after attendance at the Responsive Parenting Program (research question 1). This analysis also assessed whether post-program improvements were sustained at eight week follow up (research question 2). The analysis was performed on the sub-sample who returned questionnaires at all three time points, baseline, post-program and at follow-up.

4.3.1. Characteristics of the sample.

The sample for the RM-MANOVA was comprised of twelve participants. Mothers were aged between 24 and 39 years with a median age of 34.5 years ($M = 33.3$, $SD = 4.7$) and their children's ages ranged from four to 18 months with a median age of nine and a half months ($M = 9.3$, $SD = 4.2$). Seven (58.3%) of the children were female and five (41.7%) were male, all were single births.

In this sample, mothers reported that they were predominantly Australian born (83.3%), married or in a de facto relationship (100%) and were primiparous (58%), 42 per cent had two children, and that they currently lived in the urban area of Melbourne and surrounding suburbs (58%). The majority of these mothers had a tertiary education (67%) and 25 per cent reported that they were currently employed in some capacity. A large proportion of mothers (75%) had a history of anxiety, depression or another mental health problem and 33 per cent had received counselling since the birth of the child for which they were attending the program.

Mothers reported that the pregnancy was planned 100 per cent of the time and delivery was predominately vaginal (67%) with 75 per cent of babies born full term (>37 weeks gestation). Further, 75 per cent of mothers in this group were breastfeeding their child at the time of the study. Many participants experienced moderate to severe complications during the pregnancy (58%) and delivery (83%) of the child for whom they were attending the program, and 50 per cent experienced moderate to severe complications breastfeeding. Twenty five per cent of mothers reported that, at the time of birth, their child had moderate to severe health problems, and 42 per cent reported that their child had moderate to severe health problems at the time of completing the questionnaire.

4.3.2. Data screening and assumptions.

The sample size for the RM-MANOVA met the minimum criteria of more cases in each cell (twelve) than dependent variables (six), and no cell had less than three cases (Pallant, 2010). An examination of the Mahalanobis distance revealed that the resulting value of $\chi^2(6, n = 12) = 10.08$, did not exceed the critical value at $p = .001$, suggesting that there were no significant outliers in the sample (Pallant, 2010).

Examination of the Q-Q plots of observed versus predicted values revealed an acceptable level of linearity for the residuals of the dependent variables ($n = 12$). The Kolmogorov-Smirnov statistics revealed that maternal mood at T1 and T2, Bonding at T2 and the maternal and child sleep variables at T1, T2 and T3 were skewed. This was not unexpected as the sample size was small and there was an expectation that program attendees would vary greatly on their mood and sleep behaviours when compared to the normal population. Transformation of these variables did not improve the skewness and, given the expectations above, the linearity of the data, and that multivariate analysis of variance is robust when the sample sizes are equal, as they are in this analysis, the variables were entered into the analysis untransformed (Field, 2013; Tabachnick & Fidell, 2013).

Mauchly's Test of sphericity was non-significant for all outcome variables at $p = >.05$, suggesting that the variance of the variables at each dependent level was equal and that the assumption of sphericity was met. As this assumption was met, no corrections were made to the test statistics (Field, 2013).

4.3.3. Results of the analysis for research questions one and two.

A one-way RM-MANOVA was conducted to compare scores on maternal mood, maternal perception of mother-child bonding and child temperament, maternal sense of competence, and maternal and child sleep, at T1, prior to program attendance, T2, post

program attendance, and T3, approximately eight weeks after program attendance. The means and standard deviations of the outcome measures are presented in Table 4.3.1.

Table 4.3.1.

Means and standard deviations for outcome variables at three time points

Dependent Variable	T1 (<i>n</i> = 12)		T2 (<i>n</i> = 12)		T3 (<i>n</i> = 12)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Hours maternal sleep	6.5	1.2	7.8	0.6	7.6	0.8
Hours child sleep	9.8	2.2	11.0	1.5	11.3	1.4
Mood	12.3	6.7	7.9	7.0	6.6	4.5
Bonding	129.3	8.7	136.8	10.1	142.5	4.2
Temperament	102.5	17.1	87.3	22.2	80.8	20.1
Competence	64.3	13.3	72.0	15.3	73.3	11.1

Using Pillai's trace, there was a significant effect for time on the dependent variables with alpha set at $p = < .05$, $V = 0.89$, $F(12, 36) = 2.4$, $p = .022$; multivariate partial $\eta^2 = .44$. Pillai's trace test statistic was used as it is more robust with small samples sizes (Field, 2013). The observed power, with alpha set at .05 was $1 - \beta = .90$. These results suggest that at least one of the dependent variables improved over one of the time periods between data collection points. The effect size, partial eta square statistic, suggests that together the dependent variables explained 44 per cent of the variance in the model.

Separate univariate Analyses of Variance (ANOVAs) on the outcome variables revealed significant main effects for treatment with sphericity assumed for maternal mood, maternal perception of mother-infant bonding, maternal perception of infant temperament, maternal sense of competence, and maternal hours of sleep. A non-significant main effect of

treatment was found with sphericity assumed for hours of child sleep and this variable was subsequently excluded from further analysis. Although the hours of child sleep variable did not reach statistical significance, the observed power of .47 was low (Tabachnick & Fidell, 2013). Therefore, although the partial eta square of .20 suggests that if hours of child sleep were the only variable in the model it would have explained 20 per cent of the variance, there was insufficient power in the analysis to detect a significant difference. Table 4.3.2. displays the *F* statistics, *p* values, partial eta square and power for the ANOVAs.

Table 4.3.2.

Univariate results comparing outcome measures from T1 to T2 to T3

Dependent Variable	<i>F</i>	<i>p</i> value	η^2	1- β
Mood	9.1	.001 *	.45	.95
Bonding	11.2	.000 **	.51	.98
Temperament	12.5	.000 **	.53	.99
Competence	6.2	.010 *	.36	.85
Hours maternal sleep	5.5	.010 *	.34	.81
Hours child sleep	2.6	.092	.20	.47

Note. *df* = 2, 22. *n* = 12. * *p* < .05. ** *p* < .001.

Within-subjects repeated measures contrasts were used to distinguish differences between pairs, the results of which are displayed in Table 4.3.3. Statistically significant post-program (T1 to T2) improvements were found for maternal mood, maternal perception of mother-infant bonding, maternal perception of infant temperament, maternal sense of competence, and maternal hours of sleep. Differences for the outcome measures from post-program to follow up (T2 to T3) were not statistically significant for maternal mood, maternal perception of infant temperament, maternal sense of competence, and maternal

hours of sleep. However, maternal perception of mother-infant bonding showed a significant improvement from T2 to T3. These results suggest that the improvements from T1 to T2 were maintained and, furthermore, maternal perception of mother-child bonding continued to improve at the time of the follow up measure. The partial eta square values were large and indicated that if they were the only variable included in the model, the measures for mood, bonding, temperament, competence, and maternal sleep explained 38, 37, 53, 41, and 51 per cent respectively, of the variance in the effect for time on these outcome measures.

Table 4.3.3.

Within subjects repeated measures contrast results for T1 to T2, and T2 to T3

Dependent Variable	T1 vs T2				T2 vs T3			
	<i>F</i>	<i>p</i>	η^2	1- β	<i>F</i>	<i>p</i>	η^2	1- β
Mood	6.8	.03*	.38	.66	.94	.35	.08	.14
Bonding	6.5	.03*	.37	.64	5.3	.04*	.33	.56
Temperament	12.6	.01*	.53	.90	2.4	.15	.18	.29
Competence	7.5	.02*	.41	.71	2.0	.67	.02	.07
Hours maternal sleep	11.3	.01*	.51	.86	0.3	.59	.03	.08

Note. $df = 1,11$. $n = 12$. * $p < .05$

4.4. Research Question Three: Post-program outcomes independent of changes in maternal mood.

An RM-MANCOVA was conducted to assess whether improvements in post-program outcomes of maternal perception of mother-child bonding and infant temperament, maternal sense of competence, and hours of sleep for the mother were independent of changes in maternal mood (research question three). To maximize the sample size, and consequently the power of the analysis, data from all participants who returned questionnaires at baseline and

post-program were used. As no significant improvement was found for the effect of time on hours of sleep for the child variable in the first analysis, this variable was excluded from the RM-MANCOVA.

In order to control for pre to post-program changes in maternal mood, a mood difference score was calculated by subtracting the post-program mood score from the pre-program mood score (Tabachnick & Fidell, 2013). This method ensured that improvements in mood scores yielded a positive score, and vice versa. The mood difference score was entered as a continuous covariate into the RM-MANCOVA.

4.4.1. Characteristics of the sample.

The sample for the RM-MANCOVA was comprised of the twenty four participants who completed and returned measures at T1 and T2. Mothers were aged between 20 and 43 years with a median age of 32.5 years ($M = 33.7$, $SD = 4.0$) and their children's ages ranged from four to 17 months with a median age of eleven and a half months ($M = 9.0$, $SD = 3.7$). Fourteen (58.3%) of the children were female and ten (41.7%) were male, all were single births.

Mothers in this sub-sample reported that they were predominantly Australian born (75.0%), married or in a de facto relationship (91.7%) and were equally likely to be primi or multiparous (50%), with 63 per cent currently living in the urban area of Melbourne and surrounding suburbs. The majority of mothers had a tertiary education (65%) and 33 per cent reported that they were currently employed in some capacity. A history of mental health problems was reported by 71 per cent of mothers and 42 per cent had received counselling since the birth of the child for which they were attending the program.

Mothers reported that the pregnancy was planned 96 per cent of the time and that 83 per cent of children were born at greater than 37 weeks gestation by predominately vaginal

delivery (62.5%), further, 50 per cent of children were currently being breastfed. Many of the participants in this sub-sample reported that they had experienced moderate to severe complications during the pregnancy (42%), and delivery (58%) of the child for whom they were attending the program, and 58 per cent experienced moderate to severe complications establishing breastfeeding. Up to 21 per cent of mothers reported that their child had moderate to severe health problems at birth or the time of completing the questionnaire.

4.4.2. Data screening and assumptions.

The sample size for the RM-MANCOVA met the minimum criteria of more cases in each cell (24) than dependent variables (four), and no cell had less than three cases (Pallant, 2010). An examination of the Mahalanobis distance revealed that the resulting value of χ^2 (9, $n = 24$) = 16.4, did not exceed the critical value at $p = .001$, suggesting that there were no significant outliers in the sample (Pallant, 2010).

Examination of the Q-Q plots of observed versus predicted values revealed an acceptable level of linearity for the dependent variables ($n = 24$). The Kolmogorov-Smirnov statistics revealed that temperament T2, and maternal sleep T1 and T2 were skewed. Again, as in the first analysis, this was not unexpected as the sample size was small.

Transformation of these variables did not improve the skewness, and given that the residuals were linear, and that analysis of covariance is robust when the sample sizes are equal, the variables were entered in the analysis untransformed (Field, 2013; Tabachnick & Fidell, 2013). Mauchly's Test of sphericity was not required in this analysis as there was only two time points (Field, 2013).

More specifically to RM-MANCOVA, the assumption of independence of the covariate and the treatment effect, which precludes measuring the covariate prior to the intervention, was violated as the mood difference score which encompassed the effect of the

program was used in the present analysis. The effect of violating this assumption is that it tends to be more difficult to obtain significant results due to a decrease in reliability, as the difference score typically has a large error term as it encompasses the error from both of the scores from which it is derived (Pallant, 2010). However, it was decided to proceed despite the higher level of difficulty as it was the change from pre to post-program which was of interest in this study. Using the mood difference score ensured that the analysis could determine whether any main, or treatment, effects in the dependent variables would remain, independent of changes in maternal mood, including the effect of the program.

The homogeneity of the regression slopes assumption was tested by returning the mood difference score back into the two variables it was derived from. Each of the dependent variables, maternal perception of bonding and child temperament, maternal competence and maternal hours of sleep, at T1 was plotted against the maternal mood score at T1, the T2 dependent variables were then plotted against the maternal mood score at T2 (Field, 2013; Pallant, 2010). The lines of best fit calculated for the resulting pairs of repeatedly measured variables, indicated that for three of the outcome variables, differences in maternal perception of bonding, maternal competence and maternal hours of sleep, the regression slopes were parallel and that these variables appeared to meet the homogeneity of regression slopes assumption.

The difference in maternal perception of child temperament regression slopes indicated that there was virtually no relationship between maternal perception of child temperament scores at T1 and maternal mood scores at T1 ($r^2 = < .001$). However, at T2 the regression slope indicated that those who reported less depressive symptoms were also more likely to rate their child's temperament as less difficult ($r^2 = .16$). As the interaction effect between changes in maternal mood and the dependent variables is of primary interest, the violation of the homogeneity of regression slopes is not serious in this study. However, as

this assumption has been violated, any main effect of change in this variable with maternal mood as a covariate will not be discussed without also considering the interaction between these two variables as indicated by the difference in regression slopes.

These assumption violations were offset in part by ensuring that measurement error in the covariate was kept to a minimum (Field, 2013; Pallant, 2010) as the Edinburgh Postnatal Depression Scale used to measure maternal mood has widely accepted validity and reliability (Andrews-Horowitz et al., 2011) and had a reported reliability of Cronbach alpha of .85 in the current study. Furthermore, the robustness of MANCOVA is strengthened when there are equal sample sizes in each group as there were in this study.

4.4.3. Results of the analysis for research question three.

A one-way RM-MANCOVA was conducted to assess whether the improvements seen from T1 to T2 for maternal perception of mother-child bonding and infant temperament, maternal sense of competence and hours of maternal sleep remained significant independent of the changes in maternal mood scores. The means and standard deviations of the outcome measures are presented in Table 4.4.1. As mentioned above a variable encompassing the difference in maternal mood scores from T1 to T2 was calculated and entered as a continuous covariate in the RM-MANCOVA.

The mean of mood difference suggested that on average scores on the EDPS decreased by 3.75 ($SD = 4.7$) reflecting an overall improvement in mood. However, it is worth noting the range of this variable (min = -.7, max = 15) suggested that mood did not improve for all participants. Three of the participants (12.5%) recorded an increase in depressive symptoms and two (8%) participants did not change at all from T1 to T2.

Table 4.4.1.

Means and standard deviations for outcome variables pre and post-program

Dependent Variable	T1 (<i>n</i> = 24)		T2 (<i>n</i> = 24)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Hours maternal sleep	6.2	1.3	7.2	1.1
Bonding	130.5	9.0	135.9	9.2
Temperament	100.0	15.6	88.5	18.1
Competence	63.8	11.3	69.6	12.0

Using Pillai's trace, which is robust when sample sizes are small (Field, 2013), there was no significant effect for time on the dependent variables with alpha set at $p < .05$, $V = 0.23$, $F(4, 19) = 1.4$, $p = .27$ when the effect of the change in maternal mood was held constant, multivariate partial $\eta^2 = .27$. The observed power, with alpha set at .05 was $1 - \beta = .36$. These results suggest that when the variance explained by the changes in maternal mood was removed from the model the remaining changes in the dependent measures were not significant. However, the low level of power for this analysis should be noted.

There was a significant interaction effect of mood difference on time, which was not unexpected given the results of the assumption testing and resultant violation of the homogeneity of the regression slopes. Pillai's trace statistic indicated that there was a significant effect of the covariate, maternal mood difference, on at least one of the dependent variables with alpha set at $p < .05$, $V = 0.42$, $F(4, 19) = 3.5$, $p = .03$; multivariate partial $\eta^2 = .42$. The observed power, with alpha set at .05 was $1 - \beta = .76$.

Separate univariate Analyses of Variance (ANOVAs) were used to identify which dependent measures were involved in the interaction. Results revealed statistically significant interaction effects for difference in maternal mood on maternal perception of

mother-infant bonding and child temperament, and maternal sense of competence. The effect of difference in maternal mood on maternal hours of sleep was not significant; however, it was approaching the required significance level. Table 4.4.2. displays the F statistics, p values, partial eta squared, and observed power for the ANOVAs.

Table 4.4.2.

Univariate results indicating the interaction effect between maternal mood improvement and the improvement in outcome variables

Dependent Variable	F	p	η^2	$1-\beta$
Bonding	14.9	.001**	.40	.96
Temperament	5.2	.03*	.19	.58
Competence	5.0	.04*	.19	.57
Hours maternal sleep	3.8	.06	.15	.47

Note. $df = 1,22$. $n = 24$. * $p < .05$. ** $p < .01$

The b -values and the profile plots indicated the direction of the relationships between the outcome variables at T1 and T2, and the mood variable (Field, 2013). For the outcomes maternal perception of mother-child bonding and child temperament, and maternal sense of competence the results indicated that the more maternal mood scores improved, the more improvement was also seen in these measures. That is, as maternal mood improved mothers perceived that they had a closer bond with their child, an improved sense of competence, and they perceived their child's temperament as less difficult. Whilst the interaction between maternal mood difference and maternal hours of sleep at T1 and T2 was only approaching significance the direction of the relationship between these variables indicated that improvement in maternal mood was related to mothers reporting that they obtained more hours of sleep.

4.5. Power analysis - post hoc.

The main analyses yielded power calculations in excess of the adequate .80 recommended by Tabachnick and Fidell (2013). Post-hoc analysis of power for the RM-MANOVA was conducted using the GPower 3.1 program (Faul et al. 2009). With the parameters set at $ES = .89$ (calculated at Faul et al., 2009), $\alpha = .05$, and sample size $n = 12$, the number of levels $n = 3$, the number of measurements $n = 6$, the actual power of the analysis was $1 - \beta = 1.0$, indicating that the RM-MANOVA had the required power to detect any existing effects in the data.

Again using the GPower 3.1 program (Faul et al. 2009) post-hoc analysis of power was calculated for the RM-MANCOVA. With the parameters set at $ES = .85$ (calculated at Faul et al., 2009), $\alpha = .05$, and sample size $n = 24$, the number of levels $n = 2$, the number of measurements $n = 4$, the number of co-variates $n = 1$, the indicated actual power of the analysis was $1 - \beta = .86$, indicating that the RM-MANCOVA had the required power to detect existing effects in the data.

4.6. Attrition

Low retention rates in a study can create attrition bias. Attrition bias threatens the internal and external validity of the results as it may affect a sample in two ways (Miller & Wright, 1995). Firstly, the characteristics of the retained sample may no longer represent the original sample of respondents, meaning the results become ungeneralizable to the population from which the sample was drawn. Secondly, the covariance of the variables may be altered due to an underrepresentation of certain characteristics in the sample (Miller & Wright, 1995).

In order to assess whether there were any differences between the sub-samples of respondents at different time points with regard to demographic characteristics and responses

on the outcome measures collected prior to attendance at the Responsive Parenting Program, T1, participants were grouped by attrition and appropriate analysis was conducted. Group comparisons were matched with the sub-samples used in the RM-MANOVA and the RM-MANCOVA conducted to answer the research questions. First, the characteristics of participants who responded at all three time points were compared with those who did not. Second, the characteristics of those who responded pre and post program were compared with those who only responded pre-program attendance. The resulting analyses are now presented.

4.6.1. Sub-sample comparisons of baseline binomial demographics of those who were and were not retained in the study at T3.

As the groups were made of up of different members, a chi-square test of independence was used to compare categorical variables across the time points (Field, 2013; Pallant, 2010). Due to the very small samples sizes all variables which were not already binomial, were collapsed to produce binomial variables including parity, status of mother's relationship, post code, country of birth, education level, employment status, history of mental health problems, planning of pregnancy, current feeding method, and severity of complications during pregnancy, delivery and breast feeding, and child health problems at birth and currently. Table 4.6.1. displays the results of this analysis.

Due to the small sample size only four out of the 18 binomial demographic variables did not violate the minimum expected cell frequency assumption (Pallant, 2010). They included history of mother's mental health, severity of complications during pregnancy and breastfeeding, and current feeding method.

Table 4.6.1.

Percentages, Pearson Chi-Square and Phi statistics for the T1 binomial demographic variables for those not retained in the study vs. those retained

Demographic	Not Retained (n = 30) (%)	Retained (n = 12) (%)	Pearson Chi- Square	Asymp. Sig. 2- sided <i>p</i>	Φ
Primiparous	66.7	58.3	.26	#	
Sex of infant					
Males	40.0	41.7	.01	#	
Females	60.0	58.3	.01	#	
Mum in Relationship	83.3	100.0	2.30	#	
Urban	63.3	58.3	.09	#	
Australian born	75.9	83.3	.23	#	
Tertiary Educated	57.1	66.7	.32	#	
Working	33.3	25.0	.28	#	
History of mental health	50.0	75.0	2.19	.14	.23
Counselling since birth	31.0	33.3	.02	#	
Planned pregnancy	76.7	100.0	3.4	#	
Premature birth	16.7	25.0	.37	#	
Vaginal birth	60.0	66.7	.16	#	
Pregnancy complications [^]	36.7	58.3	1.64	.20	-.20
Delivery complications [^]	50.0	83.3	3.95	#	
Breastfeeding complications [^]	50.0	50.0	0.00	1.0	.00
Child ill health at birth [^]	23.3	25.0	.01	#	
Child ill health now [^]	10.0	41.7	5.57	#	
Breastfeeding at baseline	36.7	75.0	5.05	.03 [*]	.35

Note. # Minimum expected cell frequency assumption violated, statistic unable to be interpreted.

* Statistically significant at $p = < .05$ (two-tailed)

[^] Denotes moderate to severe complications

Chi-square values indicated that sub-samples differed significantly only on the current method of feeding $\chi^2(1, n = 42) = 5.05, p = .03, \Phi = .35$. Participants who completed questionnaires at all three time points were more likely to be breastfeeding their child at the time of completing the T1 questionnaire (75%) compared with those who returned data at T1 only or T1 and T2 (37%).

Further, by inspection it appears that those who were retained in the study were more likely to have experienced moderate to severe delivery complications (83.3%) and to have a child with ill health (41.7%) at the time of completing the T1 questionnaire, than those who were not retained of whom 50 per cent reported delivery complications and 10 per cent reported child health problems at the time of T1 data collection.

4.6.2. Sub-sample comparisons of baseline age and outcome measures of those who were and were not retained in the study at T3.

To compare the baseline data of the continuous variables of age of mother, age of child, hours of maternal sleep, hours of child sleep, maternal mood, maternal perception of mother-child bonding and child temperament, and maternal sense of competence, between those participants who were retained in the study and those who were not, a MANOVA was conducted with Time as the independent variable. The discrete variables for maternal and child sleep were analysed as continuous variables. This was appropriate according to Tabachnick and Fidell (2013), as they were comprised of seven categories and they represented the underlying quantitative continuous construct of hours of sleep.

Preliminary assumption testing was conducted to check for linearity, normality and multicollinearity, with no serious violations noted. Further, Box's test of equality of covariance matrices was larger than .001 ($p = .13$), and the Levene's tests of equality of error

variances were not significant at $p = <.05$ (Pallant, 2010; Tabachnick & Fidell, 2013), suggesting that the homogeneity of variance assumption was met.

The means and standard deviations of the continuous variables can be seen in Table 4.6.2. Pillai's Trace test statistic was interpreted as it is more robust with small samples sizes (Field, 2013). There were no statistically significant group differences on continuous variables, $V = 0.08$, $F(8, 33) = .34$, $p = .94$, partial $\eta^2 = .08$. The observed power, with alpha set at .05, was $1 - \beta = .14$.

Table 4.6.2.

Means and standard deviations of T1 data for groups by return of questionnaires

Dependent Variable	T1 ($n = 30$)		T3 ($n = 12$)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Maternal age (years)	32.4	5.5	33.3	4.7
Child age (months)	9.7	3.7	9.3	4.2
Hours of maternal sleep	6.4	1.7	6.5	1.2
Hours of child sleep	9.0	1.6	9.8	2.2
Mood	11.6	4.8	12.3	6.7
Bonding	131.9	12.1	129.3	8.7
Temperament	98.7	18.3	102.5	17.1
Competence	68.1	11.3	64.3	17.1

4.6.3. Sub-sample comparisons of baseline binomial demographics of those who were and were not retained in the study at T2.

To assess the generalizability of the results of the RM-MANCOVA which was used to examine the outcome variables independent of changes in mood, a chi-square test of independence (Field, 2013; Pallant, 2010) was used to compare binomial demographics from those who returned questionnaires pre-program attendance only ($n = 18$) and those who returned questionnaires pre and post-program ($n = 24$), including those who went on to provide follow up data. Table 4.5.3 presents the cross-tabulated frequencies for these sub-samples.

Again, due to the small sample size, six of the 18 demographic variables violated the minimum expected cell frequency assumption (Pallant, 2010). Thus, it was not possible to reliably determine if participants who returned data pre and post-program differed significantly from those who returned only pre-program data on maternal country of birth or relationship status, whether the pregnancy was planned, or the baby was born prematurely, or the severity of any child health problems at birth or currently. However, twelve of the variables met the assumptions of the analysis and as can be seen in Table 4.6.3., there were two variables with significant differences. The results for parity, $\chi^2(1, n = 42) = 4.98, p = .03, \Phi = .34$ suggest that the mothers who returned data at T1 only were more likely to have one child, whereas, those who returned data at T1 and T2 were more likely to have two or more children. Further, the results for maternal history of mental health problems, $\chi^2(1, n = 42) = 4.29, p = .04, \Phi = -.32$, suggested that mothers retained at T2 were more likely to have experienced depression, anxiety or another mental health problem previously than those who responded only at T1.

Table 4.6.3.

Percentages, Pearson Chi-Square and Phi statistics for the T1 binomial demographic variables comparing those who returned questionnaires pre and post-program attendance with those who did not

Demographic	Pre-program only (%) (n = 18)	Pre & post-program (%) (n = 24)	Pearson Chi-Square	Asym p. Sig. 2-sided p	Φ
Primiparous	83.3	50.0	5.00	.03*	.34
Sex of infant					
Males	38.9	41.7	.33	.86	-.03
Females	61.1	58.3	.33	.86	-.03
Mum in Relationship	83.3	91.7	.68	#	
Urban	61.1	62.5	.01	.93	-.01
Australian born	82.4	75.0	.31	#	
Tertiary Educated	52.9	65.2	.61	.43	.12
Working	27.8	33.3	.15	.70	-.06
History of mental health	38.9	70.8	4.29	.04*	-.32
Counselling since birth	17.6	41.7	2.65	.10	-.25
Planned pregnancy	66.7	95.8	6.30	#	
Premature birth	22.2	16.7	.21	#	
Vaginal birth	61.1	62.5	.01	.93	-.01
Pregnancy complications [^]	44.4	41.7	.03	.86	-.03
Delivery complications [^]	61.1	58.3	.03	.86	-.03
Breastfeeding complications [^]	38.9	58.3	1.56	.21	.19
Child ill health at birth [^]	27.8	20.8	.27	#	
Child ill health now [^]	16.7	20.8	.12	#	
Breastfeeding at baseline	44.4	50.0	.13	.72	-.06

Note. # Minimum expected cell frequency assumption violated, statistic unable to be interpreted.

* Statistically significant at $p < .05$ (two-tailed)

[^] Denotes moderate to severe complications

Furthermore, on inspection, it appears that the two samples may have also differed on whether or not the pregnancy was planned with 66.7 per cent of those returning data at T1 and 95.8 per cent of those returning data at T1 and T2 reporting a planned pregnancy. Therefore, results of the second analysis may only be generalizable to a subset of Responsive Parenting Program attendees.

4.6.4. Sub-sample comparisons of baseline age and outcome measures of those who were and were not retained in the study at T2.

The baseline data of the continuous variables age of mother, age of child, maternal mood, mother-child bonding, child temperament and maternal sense of competence, and the discrete variables (Tabachnick & Fidell, 2013) hours of maternal sleep, and hours of child sleep for those retained at the post-program stage of the study were compared to those who only returned pre-program questionnaires. The means and standard deviations for these variables are displayed in Table 4.6.4. A MANOVA was conducted with TIME as the independent variable. Preliminary testing revealed no serious violations of the assumptions of linearity, normality and multicollinearity. Further, Box's test of equality of covariance matrices was larger than .001 ($p = .16$) and the Levene's test of equality of error variances were not significant at $p = <.05$ (Pallant, 2010; Tabachnick & Fidell, 2013), indicating that the homogeneity of variance assumption was met.

Pillai's Trace test statistic was interpreted due to the small sample sizes of the groups. The resulting $V = 0.23$, $F(8, 33) = 1.22$, $p = .32$; partial $\eta^2 = .23$, $1-\beta = .47$, indicated that there were no statistically significant differences between the two groups on the continuous and discrete variables.

Table 4.6.4.

Means and standard deviations of T1 for participants retained at T2 and those who were not

Dependent Variable	T1 (<i>n</i> = 18)		T2 (<i>n</i> = 24)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Maternal age (years)	31.3	6.4	33.7	4.0
Child age (months)	10.5	4.0	9.0	3.7
Hours of maternal sleep	6.7	1.9	6.2	1.3
Hours of child sleep	8.9	1.7	9.4	1.9
Mood	11.8	5.2	11.7	5.5
Bonding	132.1	13.8	130.5	9.0
Temperament	99.6	20.9	100.0	15.6
Competence	71.3	11.6	63.8	11.3

Chapter 5. Discussion

5.1. Introduction

The present study extends the current body of knowledge about outcomes of early parenting programs. Two main aims were addressed. The first was to assess whether outcomes improved for mothers and children after attending a 'child focused' intervention implemented during a three to four night residential Responsive Early Parenting Program at Tweddle Child and Family Health Service (Tweddle). As part of the first aim, it was also of interest to examine whether any improvements in outcomes were sustained over time. The second aim of the study was to assess whether improvements in maternal perception of mother-child bonding and child temperament, maternal sense of competence and hours of sleep for mother and child were independent of improvements in maternal mood (research question three).

To test the first research question, that maternal mood, maternal perception of mother-child bonding, maternal perception of child temperament, amount of maternal and child sleep, and maternal sense of competence would improve from pre-program attendance to post-program attendance measures were taken prior to, and approximately one week after, attendance at the program. To assess the second research question, that improvements in maternal mood, maternal perception of mother-child bonding, maternal perception of child temperament, amount of maternal and child sleep, and maternal sense of competence would be sustained at the third time period, approximately eight weeks after program attendance. To address the third research question, that improvements in the outcome variables above would be independent of the improvement in maternal mood, the difference in maternal mood from pre to post-program was entered into the second analysis as a covariate.

This chapter will present the findings of the two main analyses conducted to address the aforementioned aims and research questions. The results of both analyses will then be

amalgamated with regard to each outcome variable, and interpretations will draw on the available literature. This will be followed by a discussion of the study's attrition rate, the strengths and limitations, and suggestions for future research. Finally, implications for practice will then be briefly discussed, before the discussion concludes.

5.2. Addressing research questions one and two.

5.2.1. Changes in outcome measures from pre to post-program

Results of the Repeated Measures Multivariate Analysis of Variance yielded partial support for the first hypothesis. Statistically significant improvements were observed from pre to post-program in the measures of maternal mood, maternal perception of mother-child bonding, maternal perception of child temperament, maternal sense of competence, and maternal hours of sleep. However, whilst hours of child sleep improved, the difference was not statistically significant.

5.2.2. Maintenance of improvements in outcomes at follow up

The repeated measures contrasts results revealed support for the second research question as no significant differences were found between post-program outcomes and follow up outcomes for maternal mood, maternal perception of child temperament, maternal sense of competence and maternal hours of sleep. Therefore, rapid gains were seen one week post-program, with no significant gain seen at two months; this suggests that improvements in these variables may have been due to the information acquired at the program rather than improvements which would have eventuated due to time and maturity in the child, or an increase in maternal experience. However, an alternate and equally plausible explanation may be regression to the mean. It is possible that unusually low pre-program scores may have trended upward toward the mean and stabilized over time without intervention.

Furthermore, the maternal perception of mother-child bonding results revealed that the pre to post-program improvements in this variable were not only sustained, but in fact had improved significantly by follow up. This finding may suggest that if a mother begins to perceive a closeness with her child, that this in turn fosters a more positive perception of her relationship with her child, which continues to enhance her perception of the child. It may be that the knowledge acquired during the program assists mothers to appreciate their child's signals as communication, thus increasing her sense of knowing her child, rather than thinking that she cannot understand her child's needs and consequently feeling detached. However, it must be acknowledged that this gain may have also been due to maturation effects and may have eventuated without the intervention.

5.3. Addressing research question three.

As suggested by Poobalan et al. (2007), it is important to examine the relationships between outcome measures, as improvements in some variables may be explained by improvements in others, rather than being due to attendance at the program. For this reason the change in maternal mood was controlled to address the third research question. Results of a Repeated Measures Multivariate Analysis of Covariance revealed no statistically significant treatment effects for maternal perception of mother-child bonding and child temperament, maternal sense of competence, or hours of maternal sleep when the change in maternal mood scores was held constant. This result suggested that when the variance in the model explained by maternal mood was removed, the amount of variance explained by each of the remaining variables was not statistically significant. Therefore, there was an observed relationship between maternal mood and the way mother-child bonding and child temperament are perceived by the mother. Further, that maternal mood was also related to the sense of competence the mother feels, and the amount of maternal sleep obtained.

5.3.1. Interaction effect of maternal mood on the outcome measures.

The above relationships were confirmed by the time by maternal mood difference results, where statistically significant interaction effects were found between all of the outcome measures and the covariate, with the exception of maternal hours of sleep (which was approaching significance). The direction of the interaction suggested that as maternal mood scores improved, mothers perceived improvement in their relationship with their child, their child's temperament was perceived as easier to manage, and their sense of competence had improved.

The above interaction results suggest that maternal mood is the catalyst to improvements in the outcome measures. However, the actual direction of change is unclear as it is possible that when a mother feels more closely bonded with her child, perceives her child's temperament as less bothersome, and, or, she feels more competent as a mother, that it has a beneficial effect on her reported mood.

5.4. Amalgamating the results of the analyses in relation to the literature.

5.4.1. Maternal Mood.

Maternal mood was entered into the first analysis as a dependent variable. Statistically significant improvements were seen in maternal depressive symptoms from pre to post-program, which were maintained at follow up. These findings are consistent with previous studies that have reported improvement in maternal mood after attendance at an early parenting program (Fisher, Rowe et al., 2004; Hiscock and Wake, 2002; Matthey & Speyer, 2008; Middlemiss et al., 2012). Pre and post admission scores on the Edinburgh Postnatal Depression Scale (EPDS) in this study (45% and 17% respectively scored in the clinical range), were comparable with the results of admission screening conducted by Tweddle of all program attendees across a twelve month period, where 46% at admission and

25% at follow up scored in the clinical range (Tweddle, 2013). Furthermore, pre and post-program, and follow up scores (8% in the clinical range eight weeks post attendance) in this study were also comparable with those found in the Rowe and Fisher (2010) study which evaluated a previous Tweddle residential parenting program in 2002. They found that pre and post score in the clinical range were 39% and 18% respectively and 12% at follow up.

Contrary to expectation, when the changes in maternal mood from pre to post-program were held constant, none of the improvement in the remaining outcomes measures was found to be independent of the effect of improvement in maternal mood. However, significant interaction effects were found for maternal perception of mother-child bonding and child temperament, and maternal sense of competence. These interactions are discussed in detail in the following sections.

5.4.2. Maternal perception of mother-child bonding.

Maternal perception of mother-child bonding improved significantly from pre to post-program. Furthermore, significant improvements were also seen from post-program to follow up. This may suggest that mother-child bonding improves significantly over time despite intervention. However, it may also represent a cumulative effect, whereby, information gained during the program may enhance the mother's understanding of her child's needs, which may help her to feel a greater sense of understanding her child. This may lead to a perception that she knows her child more intimately, which may enhance her level of bonding with her child. This effect may continue, thus, explaining the continued improvement of maternal perception of mother-child bonding in this study.

The second analysis essentially demonstrated that the improvement in maternal perception of mother-child bonding from pre to post-program was as a result of the interaction of this variable with improvements in maternal mood. This suggested that the

improvements in bonding were not main effects and should not be discussed without considering the corresponding improvement in maternal mood. That is, that one did not change without the other changing. However, as this study was not a randomized controlled study it cannot be said which variable was influencing which.

Notwithstanding the above, the improvement from post-program to follow up in maternal perception of mother-child bonding was not echoed in the maternal mood results. This may indicate that the improvement in perception of bonding seen at follow up was independent of mood. However, it may also support a hypothesis that if maternal mood improves, it may have long lasting beneficial effects on other aspects of mothering.

These results support the conclusion of Van Bussel et al. (2010), that mother-child bonding is a distinct concept and not inextricably intertwined with maternal mood. Nonetheless, the two concepts remain intertwined to some degree as was found in this study, and the Van Bussel et al. study, where mothers who reported stronger feelings of depression or anxiety symptoms, also reported lower levels of mother-child bonding. Moreover, Nugent et al. (2006) found that an intervention designed to enhance parent-child interactions and bonding, by eliciting typical newborn behaviour and then describing and interpreting the observations, and discussing them with the parents, was effective at reducing rates of postnatal depression onset by 75 per cent.

As the mother represents half of the mother-child relationship, it reasonably follows that an improvement in her perception of mother-child bonding might lead to improved outcomes for the child. Benefits may include a positive influence on the security and attachment of the child (Ainsworth, 1979; Nugent et al., 2007) and enhancement of child mental health (Bowlby, 2012; Schore, 2001).

5.4.3. Maternal perception of child temperament.

Maternal perception of child temperament was also shown to improve significantly from pre to post-program attendance. As the rapid improvement did not continue through to the follow up period, it could be concluded that the information gained at the program contributed toward mothers perceiving their child's behaviour more favourably.

Many of the questionnaire items ask mothers to rate their child compared to other children by phrasing the answers to items as average or more or less average than other children. It is possible that attending a program, with other mothers who are experiencing similar problems with their child, may influence the mother's perception of her own child's behaviour. This may lead to her rating some behaviour as average, or less difficult, after the program that she may have rated as more difficult prior to the program.

The interaction observed between maternal mood and maternal perception of child temperament was consistent with other studies (Edhbor et al., 2000; Fisher, Rowe et al., 2004; Sugawara et al., 1999; Terry et al., 1996). For example, in their study of an early parenting program at Masada private hospital mother baby unit, Fisher and Rowe (2004) found that post program attendance, mothers' reported improvement in mood was accompanied by a reduction of reported difficult temperamental child behaviours. Furthermore, Terry et al. (1996) assessed women pre and post-partum and found that caring for a child with temperamentally difficult behaviours contributed to the stress of mothers and was related to increased levels of depressive symptoms.

These results suggest that the way a mother feels is closely related to how she perceives her child's temperament. It is again worth noting that it is the mother's perception that has been measured in this study, not actually the child's temperament. In accord with the literature, it was not surprising that when mothers experience less depressive symptoms

that they may have more resources on which to draw, more patience, and more energy, which may lead them to view their child's temperament and behaviour more favourably.

5.4.4. Maternal sense of competence.

Maternal sense of competence showed a significant improvement from pre to post-program. This suggests that mothers felt more competent after attending the program. The fact that scores were sustained, but did not continue to improve from post-program to follow up, suggests that this pattern of improvement would not have resulted due to the effect of time, or child maturity. However, the interaction effect observed also suggested that maternal sense of competence was closely related to maternal mood. That is, the improvement in maternal sense of competence was dependent on a corresponding improvement in maternal mood. This result lends some support to research which suggests that maternal sense of competence may be implicated as a moderator of the effect of variables such as a difficult child temperament, on postpartum blues onset (Denis et al., 2012).

5.4.5. Maternal hours of sleep.

Prior to program attendance mothers who responded at all three time points reported that they averaged 6.4 hours of sleep per night, this amount significantly increased to 7.8 hours post-program attendance. Furthermore, the improvement in maternal sleep was maintained at follow up.

The results of the second analysis showed that when the change in maternal mood from pre to post program was accounted for, the improvement in maternal sleep was no longer significant. Further, the second analysis demonstrated that there was not a significant interaction effect between hours of maternal sleep and maternal mood over T1 and T2, however, this variable was approaching significance.

Given that Armstrong et al. (1998) suggested that mothers may at times be misdiagnosed with maternal mood problems as a result of depressive symptoms arising from sleep deprivation, it is not surprising that the analysis demonstrated that maternal mood and maternal sleep shared variance. However, the analysis demonstrates the relationship between these variables, and does not indicate causation. Therefore, due to maternal mood being entered as the covariate, it may initially seem that improvement in maternal mood is accounting for the variance in improvement in maternal hours of sleep, however, it would seem more logical to assume that improvements in maternal sleep are accounting for the improvement in maternal mood. This interpretation is in accord with the arguments presented by Bayer et al. (2007), Meltzer and Mindall (2007), and Dennis and Ross (2005) who reported an association between the onset of new maternal depressive symptoms and increased maternal fatigue.

It is also important to consider that the absence of an interaction effect between maternal mood difference and maternal hours of sleep may have been due to the power dropping to well below the recommended levels. The loss of power may have been attributed to the small effect size observed when maternal mood difference was held constant. Furthermore, the statistical significance of this interaction was very close to the nominated level despite the lack of power. Therefore, it cannot be confidently concluded that maternal mood improvements did not interact with improvement in maternal hours of sleep.

5.4.6. Child hours of sleep.

Mothers reported that on average their child slept almost ten out of 24 hours prior to attendance at the program. Although the amount of child sleep increased to an average of eleven hours after attending the program, this improvement was not statistically significant. This variable was subsequently excluded from further analyses. These results were unexpected given the extensive evidence that early parenting programs are adept at

improving the quantity of child sleep (Armstrong et al., 1998; Eckerberg, 2004; Hiscock and Wake, 2002)

The current results may indicate that the improvement observed may be explained by time and maturity of the child. However, given the large effect size, the partial eta square suggested that this variable contributed substantially (20%) to the explanation of the variance in the model, it cannot be concluded with certainty that the amount of child sleep did not improve after attendance at the responsive parenting program.

There may be several explanations for the non-significant results for hours of child sleep. First, the observed power of this variable was well below the recommended level of .80 (Tabachnick & Fidell, 2013). This may be because the small sample size combined with the skew observed in this variable to reduce the power to an inadequate level to detect a significant difference. However, a second and perhaps more pertinent explanation is the reliability of the way child sleep was measured. Although the item contained seven categories of average hours of sleep for the child over the past three days, the categories were limited at the top end of the scale. That is, the first five options were in one hour increments, however, the sixth (9-12 hours) and seventh (12-14+ hours) options had three or more hours incorporated into one selection. This effectively created a ceiling effect where the maximum value on the scale could be obtained by a child sleeping an average of 12 or more hours, an amount that could reasonably be attained by most children under the age of 18 months.

The item was originally designed to measure maternal sleep, where it was considered unlikely that a mother with a young child would sleep for more than nine hours. However, it was myopic to use the same scale to measure the amount of child sleep. It appears that a single item with enough relevant options would have been capable of capturing a significant change, as evidenced by the change shown for maternal hours of sleep with a power greater than the recommended level (Tabachnick & Fidell, 2013). Unfortunately, this may have

meant the opportunity to compare child sleep pre and post-program meaningfully was missed.

5.5. Attrition and generalization.

5.5.1. Response rates

Miller and Wright (1995) identified two main reasons why it is important to ensure that participants who are retained in a study do not differ significantly in characteristics or responses to outcome variables, from those who are not retained in a study. The first reason relates to the generalizability of the results from the final subsample to the original sample, and consequently to the population from which the original sample was drawn. The second consideration is the effect that an underrepresentation of certain characteristics may have an effect on the covariance of the variables (Miller & Wright, 1995).

Compared to similar studies of mother-baby units and parenting programs (Fisher et al., 2002; Rowe & Fisher, 2010), this study had a very low overall response rate (17.7%). Although there were also very low retention rates from pre to post-program (57%), and from post-program to follow up (50 %), resulting in an overall retention rate of 29 per cent, there were few significant differences between the subsamples used in both analyses and the original sample. Unfortunately, there is no way of knowing whether those who did not respond found the program helpful, or unhelpful, or would have followed the same response pattern as retained participants. The demographic characteristics and outcome variables at T1 of the two subsamples used in the two analyses were compared to the original sample in separate analyses, the results are discussed below.

5.5.2. A comparison of those who were and were not retained in the study at all three time points.

A comparison of the twelve participants who completed questionnaires at all three time points with the remainder of the sample, indicated that retained participants were statistically more likely to be breastfeeding their child at the time of completing the pre-program questionnaire, and by inspection, more likely to have experienced delivery complications and to have a child with ill health, than those who returned data at only the pre-program, or pre and post-program data collection points. It was not possible to determine whether the two sub-samples differed significantly on all of the demographic variables as the small sample size and the homogeneity of the samples resulted in an assumption of the analysis being violated for a large proportion of the demographic characteristics, which restricted the certainty with which it could be determined that the subsample represented the original sample.

Importantly, there were no significant differences between the two sub-samples for mean maternal and child ages or the outcome variables at T1. This suggests that even if more characteristic differences did exist they did not impact on the amount of maternal and child sleep, maternal mood, maternal perception of mother-child bonding and infant temperament, or maternal sense of competence. Therefore, despite the higher rate of breastfeeding in the retained subsample, no evidence was found of attrition bias (Miller & Wright, 1995) in the analysis used to answer the first and second research questions. Thus, results may be interpreted and generalized to the whole sample, and consequently the population of mothers who attended the responsive parenting program.

5.5.3. A comparison of those who were and were not retained in the study at the post-program data collection point.

Comparison of the twenty-four participants who returned questionnaires at the post-program collection time with those that did not, revealed that the mothers returning data only at T1 only were more likely to have one child, whereas, those who returned data at T1 and T2 were more likely to have two or more children. Further, the results for maternal history of mental health problems suggested that mothers retained at T2 were more likely to have experienced depression, anxiety or another mental health problem previously than those who responded only at T1. However, again due to the small sample size and the homogeneity of the sample, six of the eighteen characteristics violated an assumption of the analysis and could not be interpreted. Therefore, it is unclear whether the two subsamples differed significantly on maternal country of birth or relationship status, whether the pregnancy was planned, or the baby was born prematurely, or the severity of any child health problems at birth or currently. However, on inspection, it appeared that the subsamples may have differed on whether or not the pregnancy was planned, with those retained post program being more likely to have planned the pregnancy.

A comparison of the two subsamples on maternal and child age and the outcome measures at T1 revealed no significant differences between those who returned only pre-program questionnaires, and those who returned pre and post-program questionnaires. Therefore, despite the differences in parity and prior history of mental health problems between the subsamples, the two groups did not differ on the mean maternal or child age, or amount of maternal and child sleep, maternal mood, maternal perception of mother-child bonding and infant temperament, or maternal sense of competence. Thus, it appears that there was no evidence of attrition bias (Miller & Wright, 1995) on the outcome measures in the analysis used to answer the third research question. Results, therefore, may be interpreted

and generalized to the whole sample, and consequently the population of mothers who attended the responsive parenting program.

5.6. Strengths and limitations.

5.6.1. Change in maternal perception of outcome measures

There were several limitations to the current study. It must be noted that whilst the responsive parenting program is child focused, there was no information directly collected from the child. The variables in this study were measured by self-report questionnaires completed by the mother with no objective verification, and therefore any changes remain perceived changes. Whilst most of the measures had good psychometric properties it was not possible to estimate or prevent response bias. Furthermore, the measures of sleep, particularly child sleep, may not have offered sufficient specificity to allow for significant change to be detected. Therefore, it has not been established whether there were actual improvements in the bonding between the mother and her child, the child's temperament, the mother's competence, or amount of sleep for mother and baby. Objective observations would be required to establish actual improvements in these areas.

5.6.2. Randomization and a control group.

An obvious limitation to the study was the lack of randomization and control. The absence of these factors limited the attribution of causation in the study. However, given the statistically significant results, this study has provided strong evidence that future research replicating the study with randomization of participants to a treatment and a control group is warranted. The inclusion of a control group would allow for the attribution of causality by eliminating the possibility that results were due to maturation, or regression to the mean.

5.6.3. Response bias.

There were few significant characteristic differences between those in the retained samples and those lost to follow up. Differences observed included the subsample who returned data at all three time points being more likely to be breastfeeding their child at pre-program attendance, and those who returned data pre and post-program being more likely to have more than one child, and also to have a history of mental health problems than those who dropped out of the study. This suggests that response bias due to characteristic differences between the retained subsamples and the original sample were minimized.

However, the identification during data analysis of the participant who reported extremely low pre-program attendance levels of perceived mother-child bonding combined with high depressive symptoms, and endorsement of the self-harm item on the mood measure, provided a unique opportunity to compare these responses with the participant's admission screening responses on the same mood measure. When that participant's responses to the same mood measure at program admission were examined by staff at Tweddle they reported a different pattern of results. This raised the question of whether the participant was prone to socially desirable responding when completing the screening questionnaires at the time of admission. An alternate explanation may be that as the screening measure was completed at admission, that simply attending the program may have brought a sense of relief and hope to the participant that they would receive the help that they were seeking, which may have resulted in them reporting less symptoms at that time.

5.6.4. Selection bias.

Whilst it has been established with some degree of certainty that the retained sample did not differ significantly from those lost to follow up on the outcome measures, there remains a possibility of the presence of selection bias as the participants in this study elected

whether or not they would participate. Of particular note in the current sample was the comparatively high level of tertiary educated participants. This may be a reflection of those with higher education being more likely to ask for help. Alternatively, those with a high level of education may also be more likely to volunteer for the study. This suggests that the current sample may not be representative of all program attendees.

However, the proportion of participants with a post-secondary school education in the current sample was comparable with the study sample used in research conducted on a previous residential program conducted at Tweddle in 2002 (Rowe & Fisher, 2010). In that study, 62 per cent of those who received questionnaires completed and returned them. This represented over 50 per cent of all eligible program attendees during the data collection period which is a significant proportion of the available participants. This suggests that it is more likely that the overrepresentation of tertiary educated mothers in the current sample reflects a higher rate of help-seeking behaviour and therefore attendance at a parenting program, rather than a higher likelihood of volunteering to participate in the study.

5.6.5. Attrition rates.

One obvious limitation to the current study was the extremely low response rate which was then further eroded by a high attrition rate. This resulted in a small sample size. Despite adequate power being attained for the analyses to proceed and to obtain statistically significant results, the small sample size limited the opportunity to control for covariates other than differences in maternal mood.

When compared to other studies with similar methodologies such as Fisher et al., (2002), and Rowe & Fisher (2010), there appears to be one difference which may explain the low initial response rate. In those studies attendees received a verbal explanation of the study at admission to the program, and then the questionnaires were hand delivered by the

researcher. Meeting the researcher in person during recruitment may have had a beneficial effect by evoking a sense of loyalty in the mother. Furthermore, receiving the research information that way may have given the study more credibility, and further, evoked a sense of obligation to participate in the study. If this was the case, this obligation may have increased the likelihood of the participant completing the post-program and follow up measures also. This may particularly be the case in the Rowe and Fisher (2010) study as the researchers also contacted the participant by telephone one month after attendance to receive consent to send the post-program questionnaire. Contact was again made for the follow up questionnaire six months post attendance.

Furthermore, as the participants were attending the program because they were experiencing some sort of stress or fatigue due to the busy job of caring for an infant, they may have lacked the time and energy to complete the questionnaire at home. Despite the conscious effort made to design the questionnaire so that most responses could just be circled, making it as quick and easy to complete as possible, the task may have felt overwhelming fatigued mothers. It is possible that attendees had more available time to complete the questionnaires at the program, due to being away from their normal home duties.

Mothers may have been more motivated to participate in the study if some type of incentive had been offered. The opportunity to receive a gift voucher for participation is often used in research, however, in an effort to avoid coercing mothers to participate this type of incentive was not offered.

5.6.6. Effect sizes.

A strength of the current study was the magnitude of the observed effect sizes. Despite the small sample size the observed differences in scores yielded large effect sizes

which ultimately provided enough power in the analyses to allow for the detection of significant results. This is sound evidence that the variables in the study were appropriately included and warrant further exploration in future studies.

5.6.7. Maternal mood.

One limitation in the current study was a potential floor effect in the maternal mood measure. Whilst it is a widely validated and reliable screening tool, the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987) was limited in its ability to detect small changes in mood once participant's scores had decreased from the clinical range (>12) to the normal range. This may have resulted in an inability to detect statistically significant improvements from post-program to follow up data collection. If floor effects were present in the current study this may have affected the interpretation of the results.

5.6.8. Child sleep.

As discussed in detail above (5.4.5.), the scale used to measure the amount of child sleep, may have limited the item's ability to detect statistically significant improvements in this variable. With few options available at the upper end of the scale item, it is probable that ceiling effects reduced the likelihood of obtaining meaningful results with this measure.

5.7. Future research directions

The limitations identified above shape the direction of suggestions for future research. Most importantly the inclusion of a control group into which participants are randomly allocated in future research would allow for causation in response to the responsive parenting program to be discussed, and, or, attributed. Further, utilising more objective measures than maternal self-report, such as videotape measures, of maternal mood, mother-child bonding,

child temperament and maternal competence, would allow greater confidence when offering conclusions.

Maternal and child sleep could also be measured more objectively using a process akin to actigraphy. This would allow for more precise information to be gathered with regard to the breakdown of sleeping patterns. For example, the amount and length of naptimes for children throughout the day could be calculated.

It has been suggested by many researchers that maternal and child outcomes should not be examined in isolation (Armstrong et al., 1998; Dennis & Ross, 2005; Meltzer & Mindall, 2007; Poobalan et al., 2007). For example, the direction of the relationship between maternal sleep quality and quantity, and maternal mood could be considered with regard to the moderation and mediation of the outcome variables. Further, the contribution of child temperament to maternal sense of competence, or mother-child bonding could be examined with regard to level of maternal mood. The interaction effects observed in this study suggest that future researchers might like to consider the use of structural equation modeling, or a similar technique, in future data analysis. This would allow for the inter-relatedness of the maternal and child variables to be examined more closely. Furthermore, future researchers may also like to consider a measure of maternal mood which offers more specificity at both ends of the scale.

The above suggestions rely heavily on ensuring that the sample size is adequate to allow for advanced data analysis. It is therefore suggested that to maximize response rates, research questionnaires be distributed to attendees at admission to the parenting program, rather than prior as was the case in this study. However, it should be noted that there may be a large discrepancy between the information captured at admission and the information captured when the participant completes the questionnaire at their leisure, as was observed in

the data collected from the participant in this study identified as experiencing more distress at intake than at admission to the program.

5.8. Implications for practice

Bearing in mind that causation cannot be attributed in this study, the results offer some support for combining elements of both the intuitive parenting (IP) and infant behaviour management (IBM) approaches in an early parenting program. While statistically the sleep variables showed limited improvement after attendance at the program, clinically, the extra hour of sleep observed for both mother and child would be welcomed by most families. Further, the improvement in the outcome measures could indicate that the educative and supportive aspects of the program may have contributed to an overall more positive parenting experience for mothers.

The 2002 Tweddle residential parenting program was based on the IBM approach, whereas, the current Tweddle program appears to have moved along the continuum toward a more IP approach. The results of this study suggest that the shift to a more responsive parenting program did not sacrifice the efficacy of the program to attain improvements in areas considered strengths of the IBM approach. For example, improvements in maternal mood, maternal fatigue or sleep, perceived child temperamental behaviours including crying and fussing, and maternal confidence were comparable with those found in the evaluation of the 2002 program (Rowe & Fisher, 2010).

Moreover, the results of this study suggest that it is not necessary to implement IBM extinction techniques to improve outcomes for mothers and children. The post-program improvements reported in this study are comparable to those found in studies of IBM extinction techniques for maternal mood, and child behaviours (Fisher, Rowe et al., 2004;

Hiscock & Wake, 2002; Matthey & Speyer, 2008), and mother-child bonding (Matthey & Speyer, 2008).

As identified by several authors previously (Fisher, Rowe & Hammarberg, 2011; Rowe & Fisher, 2010), residential early parenting services play a major role in contributing to the treatment of non-psychotic maternal mental health problems. As up to 50% of cases of postnatal depression and anxiety reportedly remain undiagnosed and therefore untreated (Beck & Gable, 2000; Driscoll, 2006), residential early parenting programs provide an opportunity for mothers with mood disorders to receive support when they otherwise may not.

The results of this study suggest that a mother's perception of her child's temperament and her relationship with her child, and her sense of competence, is intrinsically related to her mood. Mothers may present to health care providers citing problems with child behaviour and sleep and settling difficulties which may actually be perceived problems as a result of the maternal mood problems. Moreover, there is evidence that treating postnatal depression may improve outcomes for offspring including cognitive development (Cooper & Murray, 1998), language development and behaviour problems (Driscoll, 2006), mother-infant attachment and bonding (Cooper & Murray, 1998; Moehler et al, 2006), and future risk of developing a mental health problem (Weissman et al., 2006). Therefore, this study provided some support for the suggestion of Fisher, Rowe and Hammarberg (2011) that early parenting programs should be included in a stepped model of perinatal mental health care.

5.9. Summary and conclusion

As approximately 13 per cent of mothers experience a postnatal mood disorder (Dennis, 2005; Driscoll, 2006) and approximately 5% of mother-child dyads are admitted to residential early parenting services in Victoria (Fisher, Rowe & Hammarberg, 2011), it is

important to establish the efficacy of early parenting programs which aim to improve maternal mood and other related mother-child variables. The results of this study offered information about the relationship between the outcome variables commonly cited as aims for early parenting programs. Partial support was found for the three research questions addressed in this study:

- H1. Maternal mood, maternal perception of mother-child bonding, maternal perception of child temperament, amount of maternal and child sleep, and maternal sense of competence were expected to improve from pre-program attendance to post-program attendance.
- H2. It was expected that improvements in maternal mood, maternal perception of mother-child bonding, maternal perception of child temperament, amount of maternal sleep, and maternal sense of competence would be sustained at the third time period, follow up, at approximately eight weeks post-program attendance.
- H3. When the effect of maternal mood was held constant, it was expected that there would be post-program improvements in maternal perception of mother-child bonding, maternal perception of child temperament, amount of maternal sleep, and maternal sense of competence.

With regard to attrition, those retained in the study at T2 and T3 were more likely to have experienced problems with their mental health, to have more than one child, and to be breastfeeding pre-program, than those who were not retained. It may be that these characteristics combine to describe someone who is eager to share their experience with others and therefore be more likely to return data after attendance at the program.

Causation could not be attributed in the current study due to the absence of randomization and control. What could be concluded is that attendees at the Residential Responsive Parenting Program offered at Tweddle reported improvements in their mood, perception of their level of bonding with their child, perception of their child's temperament, their sense of maternal competence, and the amount of hours of sleep they received, after they attended the program. However, limited improvement was found in the amount of hours their child slept.

It could also be concluded that the improvements observed post-program in maternal mood, perception of child temperament, maternal sense of competence, and maternal hours of sleep were sustained at eight week follow-up. Furthermore, there was an improvement from pre to post-program for maternal perception of mother-child bonding which increased further at eight week follow up.

However, the improvements in maternal perception of mother-child bonding and child temperament, maternal sense of competence, and amount of maternal sleep, from pre to post-program were accounted for by the variance shared with improvements in maternal mood. This suggests that primarily this study may have measured improvements in maternal mood from before and after attendance at the responsive parenting program. Further, that the improvements in maternal mood were closely related to improvements in the outcome variables.

Notwithstanding the above, results showed that maternal mood did not significantly improve from post-program to follow up, whereas, maternal perception of mother-child bonding did continue to improve at follow up. These results may suggest that the initial improvement in maternal perception of mother-child bonding was related to maternal mood improvement as evidenced by the observed interaction effect. The subsequent improvement in maternal perception of mother-child bonding at eight weeks was not related to

improvements in maternal mood, as maternal mood did not improve significantly over that period. This is sound evidence that whilst maternal mood and maternal perception of mother-child bonding are intertwined, on the basis of the current results they appear to be distinct concepts.

Therefore, whilst mothers may require an initial boost to their mood to improve the perceived closeness of their relationship with their child, once their mood has stabilized, mothers continue to perceive further improvements in the quality of the relationship with their child. Whether the improvement can be attributed to attendance at the Responsive Parenting Program cannot be conclusively determined due to the design of this study. However, replication of this study with the inclusion of randomization of participants to a control group in future research could address this.

References

- Adewuya, A. O., & Afolabi, O. T. (2005). The course of anxiety and depressive symptoms in Nigerian postpartum woman. *Archives Women's Mental Health, 8*, 257-259. doi: 10.1007/s00737-005-0089-5
- Ainsworth, M. S. (1979). Infant–mother attachment. *American Psychologist, 34*(10), 932-937. doi:10.1037/0003-066X.34.10.932
- Andrews-Horowitz, J., Murphy, C. A., Gregory, K. E., & Wojcik, J. (2011). A community-based screening initiative to identify mothers at risk for postpartum depression. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 40*, 52-61. doi: 10.1111/j.1552-6909.2010.01199.x
- Armstrong, K., Haeringen, A. V., Dadds, M. & Cash, R. (1998). Sleep deprivation or postnatal depression in later infancy: Separating the chicken from the egg. *Journal of Paediatrics and Child Health, 34*, 260–262. doi: 10.1046/j.1440-1754.1998.00213.x
- Australian Association of Infant Mental Health Inc. (2004). Position paper 1: Controlled crying. [Accessed 8/12/2013] at http://www.aaimhi.org/inewsfiles/controlled_crying.pdf
- Bates, J.E., Freeland, C.B., & Lounsbury, M.L. (1979). Measurement of infant difficultness. *Child Development, 50*, 794-803. doi:10.2307/1128946
- Bayer, J. K., Hiscock, H., Hampton, A. and Wake, M. (2007), Sleep problems in young infants and maternal mental and physical health. *Journal of Paediatrics and Child Health, 43*, 66–73. doi: 10.1111/j.1440-1754.2007.01005.x
- Beck, C. T., & Gable, R. K. (2000). Postpartum depression screening scale: Development and psychometric testing, *Nursing Research, 49*(5), 272-282.

- Beeber, L. (2002). The pinks and the blues: Symptoms of chronic depression in mothers during their children's first year. *American Journal of Nursing*, 102(11), 91-98.
- Bion, W. R. (1983). *Attention and Interpretation* (ebook version). Retrieved from <http://0web.a.ebscohost.com.library.vu.edu.au/ehost/ebookviewer/ebook/ZTAwMHh3d19fMzkyNTk2X19BTg2?sid=924ebc79-5e72-404e-99bf-59fe43897ba9@sessionmgr4005&vid=1&format=EB&rid=1>
- Bion, W. R. (1984). *Learning From Experience* (ebook version). Retrieved from <http://0web.a.ebscohost.com.library.vu.edu.au/ehost/detail?sid=d91c5048-9fb1-4c68-9eec-86d2f91fbdfd%40sessionmgr4004&vid=1&hid=4206&bdata=JnNpdGU9ZWVhc3QtbGl2ZQ%3d%3d#db=e000xww&AN=367144>
- Bowlby, J. (1991). *Attachment and loss, vol. 1: Attachment*. Harmondsworth: Penguin.
- Bowlby, John (2012). *A Secure Base*. Retrieved from <http://www.ebilib.com>
- Brockington, I. F., Oates, J., George, S., Turner, D., Vostanis, P., Sullivan, M., Loh, C., & Murdoch, C. (2001). A screening questionnaire for mother-infant bonding disorders. *Archive of Women's Mental Health*, 3, 133-140. doi: 10.1007/s007370170010
- Chess, S., & Thomas T. (1990). Continuities and discontinuities in temperament. In L. N. Robins & M. Rutter (Eds.), *Straight and devious pathways from childhood to adulthood* (pp. 205-220). Cambridge: Cambridge University Press.
- Chess, S., Thomas, A., & Birch, H. G. (1980). *Your child is a person: A psychological approach to parenthood without guilt. The years from birth to first grade*. NY: Penguin Books.
- Cooper, P. J., & Murray, L. (1998). Clinical review: Postnatal depression. *British Medical Journal*, 316, 1884-1886.

- Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression. Development of 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry*, *150*, 782-786. doi: 10.1192/bjp.150.6.782
- Denis A., Ponsin, M., & Callahan, S. (2012). The relationship between maternal self-esteem, maternal competence, infant temperament and post-partum blues. *Journal of Reproductive and Infant Psychology*, *30*(4), 388-397. doi: 10.1080/02646838.2012.718751
- Dennis, C. (2005). Psychosocial and psychological interventions for prevention of postnatal depression: systematic review. *British Medical Journal*, *331*, 15-18. doi: 10.1136/bmj.331.7507.15
- Dennis, C. L., & Ross, L. (2005). Relationships among infant sleep patterns, maternal fatigue, and development of depressive symptomatology. *Birth*, *32*, 187-193. doi: 10.1111/j.0730-7659.2005.00368.x
- Don, C., McMahon, C., & Rossiter, C. (2002). Effectiveness of an individualized multidisciplinary programme for managing unsettled infants. *Journal of Paediatric Child Health*, *38*, 563-567. doi: 10.1046/j.1440-1754.2002.00042.x
- Driscoll, J. W. (2006). Postpartum depression: The state of the science. *Journal of Perinatal & Neonatal Nursing*, *20*(1), 40-42.
- Eckerberg, B. (2004). Treatment of sleep problems in families with young children: effects of treatment on family well-being. *Acta Paediatrica*, *93*, 126-134. doi: 10.1111/j.1651-2227.2004.tb00686.x
- Edhbor, M., Seimyr, L., Lundh, W., & Widstrom, A. M. (2000). Fussy child-difficult parenthood? Comparisons between families with a 'depressed' mother and non-

depressed mother 2 months postpartum. *Journal of Reproductive and Infant Psychology*, 18(3), 225-239. doi: 10.1080/713683036

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149-1160. doi: 10.3758/BRM.41.4.1149 Available at <http://www.psych.uni-duesseldorf.de/abteilungen/aap/gpower3/>

Field, A. (2013). *Discovering statistics using IBM SPSS statistics: and sex and drugs and rock 'n' roll* (4th ed.) London: Sage.

Fisher, J., & Rowe, H. (2004). Building an evidence base for practice in early parenting centres. A systematic review of the literature and a report of an outcome study. *Melbourne: Key Centre for Women's Health in Society, Melbourne School of Population Health*, University of Melbourne.

Fisher, J., Feekery, C., & Rowe-Murray, H. (2002). Nature, severity and correlates of psychological distress in women admitted to a private mother-baby unit. *Journal of Paediatrics and Child Health*, 38, 140-145. doi: 10.1046/j.1440-1754.2002.00723.x

Fisher, J., Feekery, C., & Rowe, H. (2004). Treatment of maternal mood disorder and infant behaviour disturbance in an Australian private mothercraft unit: a follow-up study. *Archives of Women's Mental Health*. Vol. 7(1), 89-93. doi: 10.1007/s00737-003-0041-5

Fisher, J., Rowe, H., & Feekery, C. (2004). Temperament and behaviour of infants aged 4-12 months on admission to a private mother-baby unit and at 1-and 6-month follow-up. *Clinical Psychologist*, 1, 15-21. doi: 10.1080/13284200410001672928

- Fisher, J., Rowe, H. J., & Hammarberg, K. (2011). Admission of women, with their infants, for psychological and psychiatric causes in Victoria, Australia. *Australian and New Zealand Journal of Public Health, 35*, 146–150. doi: 10.1111/j.1753-6405.2010.00653.x
- Fisher, J., Rowe, H., Hiscock, H., Jordan, B., Bayer, J., Colahan, A., & Amery, V. (2011). *Understanding and responding to unsettled infant behaviour. A discussion paper for the Australian Research Alliance for Children and Youth*. Available at: <http://www.aracy.org.au/publicationDocuments/ARACY%20Unsettled%20Infant%20Behaviour%20report%20FINAL.pdf> [Accessed 24/09/2011].
- Forman, D., O'Hara, M. W., Stuart, S., Gorman, L. L., Larsen, K. E. & Coy, K. C. (2007). Effective treatment for postpartum depression is not sufficient to improve the developing mother–child relationship. *Development and Psychopathology, 19*, 585-602. doi:10.1017/S0954579407070289
- Harris, B. (1994). Biological and hormonal aspects of postpartum depressed mood. *British Journal of Psychiatry, 164*, 288-292. doi: 10.1192/bjp.164.3.288
- Hiscock, H., & Wake, M. (2002). Randomised controlled trial of behavioural infant sleep intervention to improve infant sleep and maternal mood. *British Medical Journal, 324*(7345), 1062-1065. doi: 10.1136/bmj.324.7345.1062.
- Hunziker, U. G., & Barr, R. G. (1986). Increased Carrying Reduces Infant Crying: A Randomized Controlled Trial. *Pediatrics, 77*(5), 641- 648.
- IBM Corp. (2012). IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.

- James-Roberts, I. S. (2007). Helping parents to manage infant crying and sleeping: a review of the evidence and its implications for services. *Child Abuse Review, 16*, 47–69. doi: 10.1002/car.968
- Johnston, C., & Mash, J. (1989). A measure of parenting satisfaction and efficacy. *Journal of Clinical Child Psychology, 18*(2), 167-175. doi.org/10.1207/s15374424jccp1802_8
- Jordan, B., Heine, R. G., Meehan, M., Catto-Smith, A. G. & Lubitz, L. (2006). Effect of anti-reflux medication, placebo and infant mental health intervention on persistent crying: A randomized clinical trial. *Journal of Paediatrics and Child Health, 42*, 49–58. doi: 10.1111/j.1440-1754.2006.00786.x
- Jung, V., Short, R., Letourneau, N., & Andrews, D. (2007). Interventions with depressed mothers and their infants: Modifying interactive behaviours. *Journal of Affective Disorders, 98*, 199-205. doi:10.1016/j.jad.2006.07.014
- Letourneau, N., Drummond, J., Fleming, D., Kysela, G., McDonald, L., & Stewart, M. (2001). Supporting parents: Can intervention improve parent-child relationships? *Journal of Family Nursing, 7*(2), 159-187. DOI: 10.1177/107484070100700203
- Matthey, S. (2004). Detection and treatment of postnatal depression. *Current Opinion in Psychiatry, 17*(1), 21-29.
- Matthey, S., Barnett, B., Howie, P., & Kavanagh, D.J. (2003). Diagnosing postpartum depression in mothers and fathers: whatever happened to anxiety? [Abstract]. *Journal of Affective Disorders, 74*(2), 139-147. doi: 10.1016/S0165-0327(02)00012-5
- Matthey, S., & Speyer, J. (2008). Changes in unsettled infant sleep and maternal mood following admission to a parentcraft residential unit. *Early Human Development, 84*, 623-629. doi: 10.1016/j.earlhumdev.2008.04.003

- Meltzer, L. J., & Mindall, J. A. (2007). Relationship between child sleep disturbances and maternal sleep, mood, and parenting stress: A pilot study. *Journal of Family Psychology, 21*(1), 67-73. doi: 10.1037/0893-3200.21.1.67
- Meredith, P. & Noller, P. (2003) Attachment and infant difficultness in postnatal depression. *Journal of Family Issues, 24*(5), 668-686. DOI: 10.1177/0192513X03252783
- Middlemiss, W., Granger, D., Goldberg, W. A., & Nathans, L. (2012). Asynchrony of mother–infant hypothalamic–pituitary–adrenal axis activity following extinction of infant crying responses induced during the transition to sleep. *Early Human Development, 88*(4), 227-232. doi: 10.1016/j.earlhumdev.2011.08.010
- Miller, R. B., & Wright, D. W. (1995). Detecting and correcting attrition bias in longitudinal family research. *Journal of Marriage and Family, 57*(4), 921-929.
- Miller, R. S. (1999). Emotion. In V. J. Derlega, B. A. Winstead, & W. H. Jones (Eds.), *Personality: Contemporary theory and research* (2nd ed.) (pp. 405-431). Chicago: Nelson-Hall.
- Moehler, E., Brunner, A., Wiebel, A., Reck, C., & Resch, F. (2006). Maternal depressive symptoms in the postnatal period are associated with long-term impairment of mother-child bonding. *Archives of Women's Mental Health, 9*, 273-278. doi: 10.1007/s00737-006-0149-5
- Nugent, J., Keefer, C., Minear, S., Johnson, L., & Blanchard, Y. (2007). Understanding newborn behavior & early relationships: the newborn behavioral observations (NBO) system handbook. Baltimore MD: Brookes Publishing.
- Nugent, J., Valim, C., Killough, J., Gonzalez, J., Wides, J., & Shih, M. C. (2006). Effect of the newborn behavioural observations (NBO) system on postpartum maternal

depression. *Paper presented at the 10th World Congress of the World Association for Infant Mental Health, Paris, France.* Accessed 15/12/2013 at <http://drkevinnugent.files.wordpress.com/2011/12/nugentposter.pdf>

Oberklaid, F. (2000). Persistent crying in infancy: a persistent clinical conundrum. *Journal of Paediatrics and Child Health*, 36, 297–298. doi: 10.1046/j.1440-1754.2000.00516.x

Ohan, J. L., Leung, D. W., & Johnston, C. (2000). The parenting sense of competence scale: Evidence of a stable factor structure and validity. *Canadian Journal of Behavioural Science*, 32(4), 251-261. doi: 10.1037/h0087122

Pallant, J. (2010). *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using SPSS*. Maidenhead: Open University Press/McGraw-Hill.

Poobalan, A. S., Aucott, L. S., Ross, L., Smith, W. C. S., Helms, P. J., & Williams, J. H. G. (2007). Effects of treating postnatal depression on mother-infant interaction and child development. *British Journal of Psychiatry*, 191, 379-386. doi: 10.1192/bjp.bp.106.032789

Porter, C. L., & Hsu, H. (2003). First-time mothers' perceptions of efficacy during the transition to motherhood: Links to infant temperament. *Journal of Family Psychology*, 17(1), 54-64. doi: 10.1037/0893-3200.17.1.54

Rowe, H. J., & Fisher, J. R. (2010). The contribution of Australian residential early parenting centres to comprehensive mental health care for mothers of infants: evidence from a prospective study. *Journal of Mental Health Systems*, 4(6). doi: 10.1186/1752-4458-4-6 Available at <http://www.ijmhs.com/content/4/1/6>

- Schore, A. N. (2001). Effects of a secure attachment relationship on right brain development, affect regulation, and infant mental health. *Infant Mental Health Journal, 2*(1-2), 7-66. doi: 10.1002/1097-0355(200101/04)22:1<7::AID-IMHJ2>3.0.CO;2-N
- Spietz, A., Johnson-Crowley, N., Sumner, G., Barnard, K. (1990). *Keys to Caregiving Manual*. NCAST Publications: Seattle, WA.
- Tabachnick, B., & Fidell, L. (2013). *Using multivariate statistics* (6th ed.). Boston: Pearson Education.
- Terry, D. J., Mayocchi, L., & Hynes, G. J. (1996). Depressive symptomatology in new mothers: A stress and coping perspective. *Journal of Abnormal Psychology, 105*(2), 220-231. doi:10.1037/0021-843X.105.2.220
- Thomas, A., & Chess, S. (1977). *Temperament and development*. NY: Brunner/Mazel, Publishers.
- Thomas, A., & Chess, S. (1989). Temperament and personality. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.). *Temperament in Childhood*. (pp. 249-261). West Sussex: John Wiley & Sons.
- Thomas, A., Chess, S., & Birch, H. G. (1968). *Temperament and behaviour disorders in children*. New York: New York University Press.
- Treyvaud, K., Rogers, S., Matthews, J., & Allen, B. (2009). Outcomes following an early parenting center residential parenting program. *Journal of Family Nursing, 15*(4), 486-501. doi: 10.1177/1074840709350878.
- Tweddle Child and Family Health Service. (2011). Sleep settling strategies. *Practice guidelines for professional use only*. Not available in the public domain.

- Tweddle Child and Family Health Service. (2013) Annual Report. Accessed online 20 January, 2014 at <http://www.tweddle.org.au/File.axd?id=4b6dc5f0-1f3d-4ffb-9e80-b382ce221761>
- Tweddle Child and Family Health Service Website. (2014). Accessed online 21 January, 2014 at <http://www.tweddle.org.au/>
- van Bussel, J. C., Spitz, B., & Demyttenaere, K. (2010). Three self-report questionnaires of the early mother-to-infant bond: reliability and validity of the Dutch version of the MPAS, PBQ and MIBS. *Archive of Women's Mental Health, 13*, 373-384. doi: 10.1007/s00737-009-0140-z
- van Den Boom, D. C. (1989). Neonatal irritability and the development of attachment. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.). *Temperament in Childhood*. (pp. 299-318). West Sussex: John Wiley & Sons.
- Walker, M. J., Davis, C., Al-Sahab, B., & Tamim, H. (2013). Reported maternal postpartum depression and risk of childhood psychopathology. *Maternal and Child Health Journal, 17*(5), 907-917. doi: 10.1007/s10995-012-1071-2
- Weinberg, M. K., Tronick, E. Z., Beeghly, M., Olson, K. L., Kernan, H. B., & Riley, J. M. (2001). Subsyndromal depressive symptoms and major depression in postpartum women. *American Journal of Orthopsychiatry, 71*(1), 87-97. doi: 10.1037/0002-9432.71.1.87
- Weissman, M. M., Wickramaratne, P., Nomura, Y., Warner, V., Pilowsky, D., & Verdeli, H. (2006). Offspring of Depressed Parents: 20 Years Later. *American journal of Psychiatry, 163*, 1001-1008. doi:10.1176/appi.ajp.163.6.1001

Winnicott, D. W. (1957). *Mother and Child: A primer of first relationships*. New York: Basic Books, Inc.

Winnicott, D. W. (2013). *The child and the outside world: Studies in developing relationships* (ebook version). Retrieved from <http://www.ebib.com>

Wittkowski, A., Williams, J., & Wieck, A. (2010). An examination of the psychometric properties and factor structure of the post-partum bonding questionnaire in a clinical inpatient sample. *British Journal of Clinical Psychology, 49*, 163-172. doi: 10.1348/014466509X445589

Appendix A

RESPONSIVE PARENTING PROGRAM QUESTIONNAIRE

INSTRUCTIONS: *Please remember that your responses are completely anonymous so that you can respond truthfully and no one will be able to identify you. Please read each question carefully, and then answer according to your experience and that of **the child for whom you are attending the program**. It is important that you respond to all items.*

Your Age: _____ No. of children: _____

Age of your child: _____ Sex of your child: _____

Your postcode: _____ Your country of birth: _____

Highest level of education completed (please circle) **Year 10 or less** **Year 11/12** **Tafe** **University**

Was your pregnancy (please circle) **planned** **unplanned** **mistimed** **unwanted**

Did you have (please circle) **single birth** **twins** **triplets** **other** _____

Did you have (please circle) **vaginal delivery** **caesarean delivery**

Was your baby born at less than 37 weeks gestation (please circle) **yes/no**

What is your current method of feeding (circle all applicable) **breast** **bottle** **cup** **solids**

If you have returned to work, circle which best applies to you

Full time

Part-time

Working from home

casual

Are you (please circle) **other**

married

de facto

single living alone

single living with

Have you ever had (please circle) **depression** **anxiety** **other mental health problems**

Have you received counselling since your youngest child was born? (please circle) **yes/no**

The statements below deal with your pregnancy and birth experience and the general health of your child. Please read each statement carefully, and then circle the number that corresponds best to you.

	None	Mild	Mod	Severe	Very Severe
1. Did you experience complications during your pregnancy? (e.g. diabetes, pre-eclampsia, morning sickness, premature labour etc.)	1	2	3	4	5
2. Did you experience complication during your child's birth? (e.g. forceps, epidural, caesarean, lengthy labour).	1	2	3	4	5
3. Did you experience complications with breast-feeding? (e.g. cracked nipples, mastitis, unable to breastfeed, unwanted pressure to breastfeed).	1	2	3	4	5
4. Did your child have any health problems at birth? (e.g. oxygen, assisted airway, jaundice, temperature irregularity, heart murmur, low apgar score, congenital abnormality, chronic disease).	1	2	3	4	5
5. Does your child have any health problems now? (e.g. colic, failure to thrive, infections, congenital abnormality, chronic disease, asthma, allergies, eczema).	1	2	3	4	5

SLEEP

Thinking about the past three days, what is the average amount of sleep you got in a 24 hour period?

1	2	3	4	5	6	7
0-4hrs	4-5hrs	5-6hrs	6-7hrs	7-8hrs	9-12hrs	12-14+hrs

Thinking about the past three days, what is the average amount of sleep the child for whom you attended the program got in a 24 hour period?

1	2	3	4	5	6	7
0-4hrs	4-5hrs	5-6hrs	6-7hrs	7-8hrs	9-12hrs	12-14+hrs

ABOUT YOU

We would like to know how you are feeling now. Please choose the answer that comes closest to how you have felt IN THE PAST 7 DAYS not just how you feel today.

Here is an example already completed.

E. I have felt happy.

Yes, all the time

Yes, most of the time

No, not very often

No, not at all

This would mean "I have felt happy most of the time during the past week"

Please complete the other questions in the same way.

In the past week:

1. I have been able to laugh and see the funny side of things.

As much as I always could

Not quite so much now

Definitely not so much now

Not at all

2. I have looked forward with enjoyment to things.

As much as I ever did

Rather less than I used to

Definitely less than I used to

Hardly at all

3. I have blamed myself unnecessarily when things went wrong.

Yes, most of the time

Yes, some of the time

Not very often

No, never

4. I have been anxious or worried for no good reason.

- No, not at all
- Hardly ever
- Yes, sometimes
- Yes, very often

5. I have felt scared or panicky for no very good reason.

- Yes, quite a lot
- Yes, sometimes
- No, not much
- No, not at all

6. Things have been getting on top of me.

- Yes, most of the time I haven't been able to cope at all
- Yes, sometimes I haven't been coping as well as usual
- No, most of the time I have coped quite well
- No, I have been coping as well as ever

7. I have been so unhappy that I have had difficulty sleeping.

- Yes, most of the time
- Yes, sometimes
- Not very often
- No, not at all

8. I have felt sad or miserable.

- Yes, most of the time
- Yes, quite often
- Not very often
- No, not at all

9. I have been so unhappy that I have been crying.

- Yes, most of the time
- Yes, quite often
- Only occasionally
- No, never

10. The thought of harming myself has occurred to me.

- Yes, quite often
- Sometimes
- Hardly ever
- Never

YOU AND YOUR BABY

Please indicate how often the following are true for you. There are no "right" or "wrong" answers:
Choose the answer which seems right in your recent experience.

1. I feel close to my baby	Always	Very often	Quite often	Sometimes	Rarely	Never
2. I wish the old days when I had no baby would come back	Always	Very often	Quite often	Sometimes	Rarely	Never
3. I feel distant from my baby	Always	Very often	Quite often	Sometimes	Rarely	Never
4. I love to cuddle my baby	Always	Very often	Quite often	Sometimes	Rarely	Never
5. I regret having this baby	Always	Very often	Quite often	Sometimes	Rarely	Never
6. The baby does not seem to be mine	Always	Very often	Quite often	Sometimes	Rarely	Never
7. My baby winds me up	Always	Very often	Quite often	Sometimes	Rarely	Never
8. My baby irritates me	Always	Very often	Quite often	Sometimes	Rarely	Never
9. I feel happy when my baby smiles or laughs	Always	Very often	Quite often	Sometimes	Rarely	Never
10. I love my baby to bits	Always	Very often	Quite often	Sometimes	Rarely	Never
11. I enjoy playing with my baby	Always	Very often	Quite often	Sometimes	Rarely	Never
12. My baby cries too much	Always	Very often	Quite often	Sometimes	Rarely	Never
13. I feel trapped as a mother	Always	Very often	Quite often	Sometimes	Rarely	Never
14. I feel angry with my baby	Always	Very often	Quite often	Sometimes	Rarely	Never
15. I resent my baby	Always	Very often	Quite often	Sometimes	Rarely	Never
16. My baby is the most beautiful baby in the world	Always	Very often	Quite often	Sometimes	Rarely	Never
17. I wish my baby would somehow go away	Always	Very often	Quite often	Sometimes	Rarely	Never
18. I have done harmful things to my baby	Always	Very often	Quite often	Sometimes	Rarely	Never
19. My baby makes me anxious	Always	Very often	Quite often	Sometimes	Rarely	Never
20. I am afraid of my baby	Always	Very often	Quite often	Sometimes	Rarely	Never
21. My baby annoys me	Always	Very often	Quite often	Sometimes	Rarely	Never
22. I feel confident when changing my baby	Always	Very often	Quite often	Sometimes	Rarely	Never
23. I feel the only solution is for someone else to look after my baby	Always	Very often	Quite often	Sometimes	Rarely	Never
24. I feel like hurting my baby	Always	Very often	Quite often	Sometimes	Rarely	Never
25. My baby is easily comforted	Always	Very often	Quite often	Sometimes	Rarely	Never

ABOUT YOUR BABY

On the following questions please circle the number that is most typical of your child.
 “About average” means how you think the typical child would be scored.

1. How easy or difficult is it for you to calm or soothe your child when he/she is upset?

1	2	3	4	5	6	7
very easy			about average			difficult

2. How easy or difficult is it for you to predict when your child will go to sleep and wake up?

1	2	3	4	5	6	7
very easy			about average			difficult

3. How easy or difficult is it for you to predict when your child will become hungry?

1	2	3	4	5	6	7
very easy			about average			difficult

4. How easy or difficult is it for you to know what’s bothering your child when he/she cries or fusses?

1	2	3	4	5	6	7
very easy			about average			difficult

5. How many times per day, on the average, does your child get fussy and irritable—for either short or long periods of time?

1	2	3	4	5	6	7
never	1-2 times	3-4 times	5-6 times	7-9 times	10-14 times	more than
	per day	per day	per day	per day	per day	15

6. How much does your child cry and fuss in general?

1	2	3	4	5	6	7
very little; much			average amount; about as			a lot; much
less than the			much as the average child			more than the
average child						average child

7. How did your child respond to his/her first bath?

1	2	3	4	5	6	7
very well--			neither liked nor			terribly--
child loved it			disliked it			didn't like it

8. On average, how much attention does your child require, other than for care giving (feeding, nappy changes, etc.)?

1	2	3	4	5	6	7
very little—much less than average			average amount			a lot—much more than the average child

9. How does your child typically respond to a new person?

1	2	3	4	5	6	7
almost always responds favourably			responds favourably about half the time			almost always responds negatively at first

10. How does your child typically respond to being in a new place?

1	2	3	4	5	6	7
almost always responds favourably			responds favourably about half the time			almost always responds negatively at first

11. How well does your child adapt to things (such as in items 7-10) eventually?

1	2	3	4	5	6	7
very well, always likes it eventually			ends up liking it about half the time			almost always dislikes it in the end

12. How easily does your infant get upset?

1	2	3	4	5	6	7
very hard to upset-- even by things that upset most babies			about average			very easily upset by things that wouldn't bother other babies

13. When your child gets upset (e.g., before feeding, during a nappy change, etc.), how vigorously or loudly does he/she cry and fuss?

1	2	3	4	5	6	7
very mild intensity or loudness			moderate intensity or loudness			very loud or intense, really cuts loose

14. How does your child react when you are dressing him/her?

1	2	3	4	5	6	7
very well-- likes it			doesn't mind it		about average—	doesn't like it at all

15. How active is your child in general?

1	2	3	4	5	6	7
very calm and quiet			average			very active and vigorous

16. When left alone, your child plays well by him/herself.

1	2	3	4	5	6	7
almost always			about half the time			almost never won't play by self

17. What kind of mood is your child generally in?

1	2	3	4	5	6	7
very happy and cheerful			Neither serious nor cheerful			serious

18. How does your child react to being confined (as in a carseat, high chair, playpen, etc.)?

1	2	3	4	5	6	7
very well— likes it			minds a little or protests once in a while			doesn't like it at all

19. How much does your child want to be held?

1	2	3	4	5	6	7
wants to be free most of the time			sometimes wants to be held, sometimes not			a great deal-- wants to be held almost all the time

20. How does your child respond to disruptions and changes in everyday routine, such as when you go to church or a meeting, on trips, etc.?

1	2	3	4	5	6	7
very favourably, doesn't get upset			about average			very unfavourably, gets quite upset

21. How easy is it for you to predict when your child will need a nappy change?

1	2	3	4	5	6	7
very easy			about average			very difficult

22. How changeable is your child's mood?

1	2	3	4	5	6	7
changes seldom, and changes slowly when he/she does change			about average			changes often and rapidly

23. How excited does your child become when people play with or talk to him/her?

1	2	3	4	5	6	7
very excited			about average			not at all

24. Please rate the overall degree of difficulty your child would present for the average mother.

1	2	3	4	5	6	7
super easy			ordinary, some problems			highly difficult to deal with

25. How much does your child cuddle and snuggle when held?

1	2	3	4	5	6	7
a great deal— almost every time			average; sometimes does and sometimes doesn't			very little; seldom cuddles

ABOUT YOU

Please rate the following items. Choose the answer which seems right in your recent experience

1. **The problems of taking care of a child are easy to solve once you know how your actions affect your child, an understanding I have acquired.**

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

2. **Even though being a parent could be rewarding, I am frustrated now while my child is at his/her present age.**

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

3. **I go to bed the same way I wake up in the morning, feeling I have not accomplished a whole lot.**

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

4. **I do not know why it is, but sometimes when I'm supposed to be in control, I feel more like the one being manipulated.**

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

5. **My mother/father was better prepared to be a good mother/father than I am.**

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

6. **I would make a fine model for a new mother/father to follow in order to learn what she/he would need to know in order to be a good parent.**

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

7. **Being a parent is manageable, and any problems are easily solved.**

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

8. A difficult problem in being a parent is not knowing whether you're doing a good job or a bad one.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

9. Sometimes I feel like I'm not getting anything done.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

10. I meet my own personal expectations for expertise in caring for my child.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

11. If anyone can find the answer to what is troubling my child. I am the one.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

12. My talents and interest are in other areas, not in being a parent.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

13. Considering how long I've been a mother/father, I feel thoroughly familiar with this role.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

14. If being a mother/father of a child were only more interesting. I would be motivated to do a better job as a parent.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

15. I honestly believe I have all the skills necessary to be a good mother/father to my child.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

16. Being a parent makes me tense and anxious.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

17. Being a good mother/father is a reward in itself.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

Thank you for your time

Appendix B

INFORMATION TO PARTICIPANTS INVOLVED IN RESEARCH



This information sheet is yours to keep.

You are invited to participate in a research project entitled **'The effect of a responsive parenting program on maternal perception of child temperament and mother-child bonding, and maternal mood'**.

This project is being conducted by a student researcher, Kim Perrow, as part of a Doctorate in Clinical Psychology at Victoria University, under the supervision of Dr Carolyn Deans from the Faculty of Arts, Education and Human Development. This study aims to explore whether mothers, with children aged 18 months or younger, feel differently about themselves and their relationship with their child, after attending a Responsive Parenting Program.

You are requested to complete the attached questionnaire at three time points,

1. Before you attend the program; 2. Immediately after your attendance, and; 3. Eight weeks after attending the program. **Completion should take 10-15mins.** You may choose to have questionnaires mailed to you at times two and three, or alternatively you can choose to be contacted for a phone interview with the Student Researcher, please complete and return the attached consent form for your preferred method of delivery.

Your **participation is entirely voluntary**. There are no right or wrong answers as every mother's experience is unique. You can be completely honest as **your responses will be kept separate from your contact details**. Accordingly, please only write your details on the consent form, and do not include any identifying marks on the questionnaire. There are some questions about your age and education, your child's age, and your thoughts and feelings regarding yourself and your child.

Completion of the questionnaire may alert you to changes in the way that you feel about yourself and your relationship with your child. You are encouraged to seek support from the providers listed below to discuss any concerns that may arise.

The researcher will be collating the responses to assess the experience of mothers who have attended the Responsive Parenting Program; your participation will contribute to the shaping and improvement of this program. The results of this study will appear in a thesis, and may be presented at conferences, or published in professional journals. **You may withdraw from the study at any time during the data collection period.** The supervisor will keep all questionnaires, for a period of 5 years, in a locked filing cabinet, and computer stored data will be password protected. Results may be obtained through the thesis library of Victoria University, or from the researcher.

Should completing this questionnaire raise any issues for you, please feel free to contact:

Dr Glen Hosking, Clinical Psychologist, at Victoria University on 03 9919 2266.

Other support services that may be of assistance:

Victoria University Psychology Clinic (Free)	9919 2353
LIFELINE (24 hours)	13 11 14
Beyond Blue	www.beyondblue.org.au
Parent Line from (8am-10pm, 7 days a week)	1300 30 1300

The staff at Tweddle Child and Family Health Service have sent you this initial questionnaire pack to be completed before you commence the program. On the attached Consent form you may elect to receive the second and third questionnaires by mail, or to be contacted for a phone interview. You may return completed questionnaires and the consent form in the return-addressed, reply paid envelope attached. Questionnaires will be coded to ensure anonymity and contact information will be kept separately. Responses will then be entered into a password protected computer file in preparation for statistical analysis, and results will be interpreted and written into a Doctoral Thesis.

Who is conducting the study?

Dr Carolyn Deans	School of Social Sciences and Psychology, St Albans Campus, Victoria University Ph: 9919 2334, email: carolyn.deans@vu.edu.au
Kim Perrow	kim.perrow@live.vu.edu.au
Tweddle Child and Family Health Service	53 Adelaide St, Footscray, Vic 3011, Ph: 9689 1577

Any queries about your participation in this project may be directed to Dr Carolyn Deans.

If you have any queries or complaints about the way you have been treated, you may contact the Research Ethics and Biosafety Manager, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 or phone (03) 9919 4148 and quote reference no: VUHREC - HRETH 12/96

Appendix C

**CONSENT FORM FOR PARTICIPANTS INVOLVED IN RESEARCH****INFORMATION TO PARTICIPANTS:**

We would like to invite you to be a part of a study into the effect of a Responsive Parenting Program on the way a mother feels about herself and her relationship with her child. After completing the self-report questionnaires you may wish to talk to someone about how you feel. Please see the attached information sheet for the contact details of available services.

CERTIFICATION BY SUBJECT

I, _____ (name)

of _____ (mailing address)

certify that I am at least 18 years old and that I am voluntarily giving my consent to participate in the study:

"The effect of a responsive parenting program on maternal perception of child temperament and mother-child bonding, and maternal mood" being conducted at Victoria University by: Dr Carolyn Deans

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me via an information sheet by: Kim Perrow, Student Researcher, and that I freely consent to participation involving the below mentioned procedures:

- Complete self-report questionnaires prior to commencing the program, immediately after attending the program, and eight weeks after attending the program

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential.

Please forward post program questionnaires to the address above or;

I would prefer to be contacted by phone after attending the program to be interviewed by the Student Researcher and I can be contacted on _____ (phone number)

I am scheduled to attend the Responsive Parenting Program conducted at Tweddle Child and Family Health Service on _____

Signed:

Date:

Any queries about your participation in this project may be directed to the researcher
Dr Carolyn Deans
Ph: 9919 2334

If you have any queries or complaints about the way you have been treated, you may contact the Research Ethics and Biosafety Manager, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 or phone (03) 9919 4148 and quote reference no: VUHREC - HRETH 12/96

PLEASE USE THE SUPPLIED REPLY PAID ENVELOPE TO RETURN THIS FORM WITH YOUR COMPLETED QUESTIONNAIRE TO THE RESEARCHERS AT YOUR EARLIEST CONVENIENCE. THANK YOU FOR YOUR TIME.

Appendix D



MEMO

TO Dr Carolyn Deans
AEHD – School of Social Sciences and Psychology
Victorian University
St Albans Campus

DATE 22/05/2012

FROM A/Professor Harriet Speed
Chair
Victoria University Human Research Ethics Committee

SUBJECT VUHREC Application – HRETH 12/96
T

Dear Dr Deans,

Thank you for submitting this application for ethical approval of the project entitled:

HRETH 12/96 The effect of responsive parenting program on maternal perception of child temperament and mother-child bonding, and maternal mood

The proposed research project has been accepted and deemed to meet the requirements of the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007)' by the Chair of the Victoria University Human Research Ethics Committee. Approval has been granted from **22 May 2012** to **22 May 2014**.

Continued approval of this research project by the Victoria University Human Research Ethics Committee (VUHREC) is conditional upon the provision of a report within 12 months of the above approval date (**22 May 2013**) or upon the completion of the project (if earlier). A report proforma may be downloaded from the VUHREC web site at: <http://research.vu.edu.au/hrec.php>.

Please note that the Human Research Ethics Committee **must be informed of the following**: any changes to the approved research protocol, project timelines, any serious events or adverse and/or unforeseen events that may affect continued ethical acceptability of the project. In these unlikely events, researchers must immediately cease all data collection until the Committee has approved the changes.

Researchers are also reminded of the need to notify the approving HREC of changes to personnel in research projects via a request for a minor amendment. It should also be noted that it is the Chief Investigators' responsibility to ensure the research project is conducted in line with the recommendations outlined in the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007).'

On behalf of the Committee, I wish you all the best for the conduct of the project.

A/Professor Harriet Speed
Chair
Victoria University Human Research Ethics Committee

Appendix E



PARENTING WITH CONFIDENCE

Victoria University

Human Research Ethics Committee

I wish to confirm that Tweddle Child + Family Health Service is pleased to collaborate with Dr Carolyn Deans and Kim Perrow on "The effect of a responsive parenting program on maternal perception of child temperament and mother-child bonding, and maternal mood" being conducted at Victoria University-Melbourne.

Intake staff at Tweddle Child + Family Health Service will invite clients to participate in the study and seek permission to send a questionnaire pack prepared by the researchers, which includes a plain language statement explaining the purpose of the study, a consent form, a return-addressed reply paid envelope and the questionnaires.

Should you require any further information on Tweddle's participation do not hesitate to contact me.

Yours sincerely

Vivienne Amery

CHIEF EXECUTIVE OFFICER