

The Impact of the Antenatal Class 'Baby World' on the
Caregiver -Infant Relationship – A Pilot Study

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Abstract

Research suggests that the relationship between caregivers and their infants has a significant effect on development and well-being across the lifespan. There is a significant body of research into psychological interventions which focus on this relationship. However, there is only limited research into the impact of antenatal interventions which aim to promote the caregiver-foetus relationship, thus preventing later difficulties in the caregiver-infant relationship. Findings so far suggest that such interventions could be effective, and recommendations have been made for further studies exploring the effect antenatal interventions on the caregiver-foetus relationship. This pilot study explored the impact of a newly developed psychoeducational intervention entitled “Baby World” on the caregiver-foetal relationship. Seventy-nine females and 26 males who were expecting their first child were recruited from an NHS midwife service in London. They were randomly allocated to experimental or control groups. All participants completed questionnaires measuring antenatal attachment, mental health and childhood experiences of caregiving at baseline. Those in the experimental group then attended the Baby World class. All participants then completed the questionnaires for a second time, and then attended the standard antenatal classes. Following attendance at these classes, participants completed the questionnaires for a third time and gave anonymous responses to qualitative questions. Statistical analyses of the quantitative data indicated that the intervention did not have an impact on antenatal attachment. Results did show that antenatal attachment increased over time, whilst anxiety decreased. A significant correlation was found between recollections of maternal caring and antenatal attachment. Qualitative analysis suggested that the intervention did have an impact on aspects of the relationship. In the qualitative responses, the majority of participants wrote that the class had been a positive experience for them, and that it had increased their confidence about being a caregiver. Many of the responses indicated that the class had positively affected their skills in reflective functioning, caregiver sensitivity and attunement, and changed their perspective on how to interact with their infant. The results add to the literature regarding the impact of antenatal interventions on the caregiver-foetus relationship. Further research is needed to explore the impact of the intervention on the relationship more closely, in particular to understand which aspects of the relationship may be affected. There are several limitations of the study, in particular the small sample size

and the limited number of expectant fathers who participated. Reasons for these limitations are discussed.

1 Introduction

1.1 Overview

In the introduction, relevant research will be used to support the following argument:

Research suggests that the caregiver-infant relationship has a far reaching impact on the cognitive (Shonkoff & Phillips, 2000), emotional (Siegal, 1999) and social (Belsky, 1999) development of infants and on their mental health across the lifespan (Weich, Patterson, Shaw, & Stewart-Brown, 2009), and therefore is an important area for psychological research (Balbernie, 2002). An understanding of the term 'caregiver-infant relationship' is given below in section 1.3. Findings from interventions aimed at developing this relationship suggest they could be effective (Barlow et al, 2008), and that the earlier interventions take place the more effective and resource efficient they could be (MacLeod & Nelson, 2000). The caregiver-infant relationship is thought to begin from conception (Rubin, 1967). It is therefore thought that interventions aimed at improving the relationship could begin during pregnancy (antenatally) rather than postnatally. A small number of studies have attempted to investigate the impact of antenatal interventions on the relationship. However, due to the limited quality and number of studies and the potential impact of antenatal interventions it has been recommended that further intervention studies should be conducted, in order to examine their impact on the relationship throughout pregnancy and beyond (Fonagy, 1998).

It is important to note that this relationship is not considered to be the only factor affecting infant development and mental health, indeed many other factors have been shown to have a powerful impact. However, given the extensive literature on this subject and the limits of what is possible in this study, the focus in this study has been placed specifically on the impact of the relationship.

Following an explanation of the literature search strategy and a rationale for the terms used in this study, the key topics of the study will be introduced. Firstly the literature describing the caregiver-foetus and caregiver-infant relationships will be presented, followed by a consideration of their impact on development and health over the lifespan. Interventions that have focused on developing the relationship will then be reviewed and a rationale for further research into this area will be given.

1.2 Literature Search Strategy

An initial search for relevant papers was carried out using the PsycINFO database. The search terms 'antenatal attachment', 'maternal foetal/fetal attachment' and 'paternal foetal/fetal attachment' were used, however this produced over 11 000 results. This was reduced by including terms such as 'intervention', 'impact' 'class' and 'classes'. Key papers were read and relevant references for reviews and individual articles were taken.

From the reviews and articles, a list of further key search terms was compiled, including 'caregiver-infant relationship', 'mentalization', 'mind-mindedness', 'caregiver-foetus', 'perinatal intervention', 'attachment and mental health', 'attachment and brain', 'attachment and lifespan' and 'caregiver relationship'. These terms were used to search in Google Scholar and the following databases: PsycINFO, PubMed and Web of Science. Studies were only included if they were reported in English. Any further studies were identified using reviews of perinatal interventions, including those of Gagnon and Sandall (2007), Barnes and Freude-Lagevardi (2003), Mercer and Walker, (2006), Brown and Sturgeon (2005) and Magill-Evans, Harrison, Rempel, and Slater (2006).

1.3 Choice of Terms

Within this area of interest several different terms have been used to describe the relationship between caregiver and infant that begins from conception. These include 'antenatal attachment', 'maternal-foetal attachment', 'paternal-foetal attachment' and 'the maternal-foetal relationship'.

Both 'attachment' and 'relationship' have been used to describe the connection between caregivers and their foetuses or infants. Throughout this study, 'relationship' has been used as a term which includes the idea of attachment. However in referring to other's work an attempt has been made to use the term they chose in order to stay close to their descriptions. Therefore at times the two terms are used interchangeably. The debate as to whether the term 'attachment' can be included within a description of the antenatal relationship is discussed in section 1.5.4.

Many studies exploring the relationship between caregiver and infant have focused on mothers, without explanation of their exclusion of other key caregivers. This focus can perpetuate the acceptance of the absence of fathers or their exclusion. Furthermore

there is the increasing possibility that one of the caregivers will not be a biological parent, particularly with many grandparents taking a key caregiving role (Fergusson, Maughan, & Golding, 2008; Thomas, Sperry, & Yarbrough, 2000). Ainsworth (p933, 1979) was one of the first to propose the idea of the attachment relationship. She suggested that the caregiver "...need not be the natural mother but can be anyone who plays the role of principal caregiver." For this study 'caregiver' has been used throughout, both for consistency and to be as inclusive as possible of all those who take responsibility for caring for an infant. The exception to this is when referring to studies which focus on a specific cohort.

The caregiver-foetus relationship and caregiver-infant relationship have been separated in the literature and it is proposed that they have different characteristics. However, this study will argue that to some extent they exist as two points on a continuum and are closely related, with the caregiver-foetus relationship having a significant impact on the caregiver-infant relationship. Therefore within this project, both terms have been used.

1.4 The Caregiver-Infant Relationship

The caregiver-foetus relationship is a concept that developed from theories around the caregiver-infant relationship, particularly the theory of attachment (Bowlby, 1951).

1.4.1 Attachment Theory and the Role of the Infant

Attachment theory is one of the most widely accepted and applied theories of human relationships across the lifespan (Schaffer, 2004) and has provided a framework for research into the effects of early relationships on development (Balbernie, 2001). Attachment theory was first developed by the British Psychiatrist and Psychoanalyst John Bowlby (1951). It focuses on the importance of relationships between infants and caregivers and attempts to account for the tie that develops between them.

The theory of attachment initially focused on the actions of the infant (Bowlby, 1973; Sroufe & Waters, 1977). Bowlby (1988) proposed that infants were predisposed to form close affectionate bonds with their caregivers and that this was "a basic component of human nature" (p. 120-121). The goal of this attachment was survival (Brandon, Pitts, Denton, Stringer, & Evans, 2009), by ensuring that a caregiver was readily available and

inclined to provide protection, nourishment or to meet other needs (Bowlby, 1988). An attachment figure could be used as a 'secure base' (Ainsworth, Blehar, Waters, & Wall, 1978) from which the infant could explore their environment and then return (Ainsworth, 1967; Schaffer & Emerson, 1964, cited in Bretherton 1992).

Mary Ainsworth and her colleagues (1978) conducted in-depth observations of young infants and their mothers and combined these findings with those from a procedure called the "strange situation". As part of this procedure infants are separated from their caregiver and then reunited. They looked at patterns of how the child responded to the mother and how the mother responded to the child, particularly following separation. The findings led them to define different patterns of attachment. These are known as secure or insecure, with the latter being avoidant, resistant/ambivalent or disorganized. Each is characterized by distinctly different behaviours of the infant, and each correspond to particular styles of caregiving. The table below highlights aspects of each attachment style:

Table 1: Attachment styles and related behaviour

Attachment Style	Infant Behaviour	Caregiver Behaviour
Secure	Shows distress at being separated from caregiver, easily comforted on their return.	Responds quickly to infant's needs, comforts infant when in distress.
Avoidant	Does not show distress at being separated from caregiver, does not approach caregiver on their return.	Rejects attachment behaviour (e.g. ignore attempts at physical closeness), or reports resentment at having to care for infant.
Resistant/Ambivalent	Already distressed before being separated from caregiver, not soothed by caregiver on their return.	Inconsistent and lack of sensitive responding to infants' attempts at closeness and comfort.
Disorganised	Responds to return of caregiver with contradictory and confusing behaviours (e.g. freezing, appearing apprehensive, and moving in an undirected manner).	May have traumatized the infant or been observed by the infant being traumatized themselves.

As can be seen in the table above, Ainsworth introduced the importance of the feelings and behaviours of the caregiver (Brandon et al., 2009) in influencing the attachment relationship. Caregivers were thought to show varying degrees of understanding and engagement with the world of their baby. A classification of a secure attachment was highly correlated with those caregivers who were described as being more “sensitively responsive” (Ainsworth, 1979, p933). Ainsworth (1971) described a sensitive caregiver as one who is “capable of perceiving things from [the child’s] point of view” (p43), which then “...emerges as sensitive responsiveness to infant signals and communications” (Ainsworth, Blehar, Waters, & Wall, 1978, p152).

It is proposed that caregiver factors have an impact on the “inner, psychological, world” of the infant (Balbernie, p3, 2001) and that this continues to have a myriad of influences throughout the life span (Ainsworth & Bowlby, 1991). Bowlby particularly stressed the impact of attachment on the internal model of the self and relationships with others (1973, 1988). He suggested that both relating to oneself and to others are learnt from the attachment relationship, and then passed on to the next generation through subsequent attachment relationships. Bowlby therefore suggested that it was these relationships rather than primarily genetics that influenced the intergenerational mental health of families (Bowlby, 1973, cited in Bretherton, 1992). As a result, Bowlby was perhaps one of the original supporters of working with parents in order to support children with their mental health, noting that, “if a community values its children it must cherish their parents.” (Bowlby, 1951, p. 84).

Bowlby and Ainsworth’s work on understanding and defining the caregiver aspects of the caregiver-infant relationship has been continued by many others. For example, Kaplan, Evans and Monk (p250, 2008) have redefined parental sensitivity as, “the extent to which the parent can consistently read and respond to the child’s cues”. Tronick (2002) has proposed that the important characteristics of caregivers are attunement, warmth, synchrony and reparation of ruptures, all of which have been researched further. Other features of the caregiver which have received significant attention in the field of clinical psychology over the past few decades (Rosenblum, 2008) are ‘mind-mindedness’, ‘mentalization’ and ‘affect-regulation’; all of which are relevant to this research. These concepts are discussed below.

1.4.1.1 Mind-Mindedness

Mind-mindedness is the extent to which the caregiver can treat their infant as one who has their own mind rather than one with merely physical needs (Meins, 1997). Parr (2009) suggests that those who do not think about why their infant is behaving in a certain way are more likely to develop an insecure attachment relationship with their infant, compared to those who can respond to the cues of their infant in a more thoughtful manner. This construct has been operationalised particularly by attending to “mind-minded comments” (Meins et al, 2003) made by the caregiver when responding to their infant’s behaviour, i.e. comments about the infant’s mental state. For example, caregivers might comment on infants’ mental states with sentences such as “I think that you think it’s a drum”, “Do you recognise that?” or “Are you playing with me?” (Meins, Fernyhough, Fradley, & Tuckey, 2001). Studies have shown that maternal sensitivity and mind-mindedness are related but distinct aspects of caregiver behaviour. Both have been found to predict attachment security. It has been suggested that the difference is that mind-mindedness specifically refers to the caregiver’s capacity to engage with their infant at a mental level, whilst sensitivity is a more generalised construct which refers to responding at a mental, physical or emotional level (Fonagy, Steele, Steele, Higgitt & Target, 1994).

1.4.1.2 Mentalization

Mentalizing can be described as “the capacity to ascribe thoughts, feelings, ideas, and intentions to ourselves as well as to others” and to use this to “anticipate and influence our own and others’ behavior” (Sharp and Fonagy, 2008, p738).

Mentalization affects the attachment security and classification of the infant, and the infant’s socio-cognitive development. To expand, the more accurate and appropriate parental mentalizing of the infant is, the more secure the attachment bond will be, and the more the infant will develop their own mentalizing ability. Fonagy and colleagues use the term ‘reflective functioning’ to describe the construct in operationalised form (Sharp & Fonagy, 2008). Reflective functioning can be identified and measured using adult’s narratives of their childhood or of their child (Fonagy, Target, Steele, & Steele, 1998). Research has indicated that measures of mind-mindedness and reflective functioning have been predictive of attachment security (Meins et al., 2003; Fonagy, Steele & Steele, 1991).

1.4.1.3 Affect-Regulation

Affect-regulation is another factor relating to the caregiver-infant relationship. In short, this is the ability of an individual to recognise, respond to and manage the emotions that they or another are feeling at a level that is in proportion to the context, without becoming overwhelmed. Affect-regulation is thought to develop over time with input from caregivers, particularly through affective attunement (Stern, 1985). This is the degree to which a caregiver responds in line with the affect expressed by the infant. Rather than directly imitating the behaviour of the infant, the caregiver responds to the perceived internal affective state of the infant (Fonagy, Gyorgy, Jurist, & Target, 2005)

If a caregiver can engage in affective attunement, then the caregiver can regulate the changing arousal levels of the infant, such as an infant's fearful response to a novel or painful situation. By recognising emotional states in their infant and responding to them appropriately the infant feels contained and in turn learns to manage their own emotions. The infant learns to both evaluate changes in their environment and form suitable responses to cope with this (Schoore, 2001). Affect-regulation is linked to mentalization because it is proposed that caregivers need to be able to mentalize in order to attune to and regulate their infant's affect.

Therefore if a caregiver can engage in reflective functioning and mind-mindedness, and in turn can be attuned to their infant, the infant can feel secure and contained, and begin to develop a secure attachment as well as a capacity for mentalization and affect regulation. Figure 1 overleaf summarises these ideas:

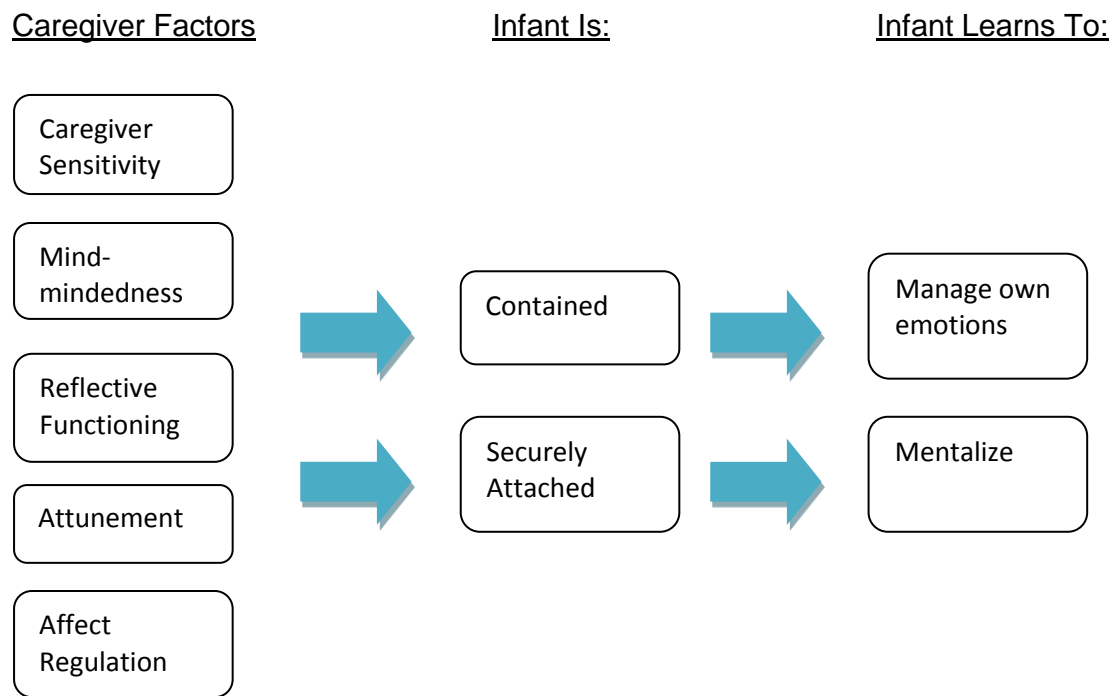


Figure 1: The impact of caregiver factors on the infant

It is important to note again that these factors, and indeed the caregiver-infant relationship as a whole do not exist in a vacuum. Many other factors are known to affect infant development and well-being, and although they are not explicitly discussed here, their significant impact is acknowledged.

1.5 The Caregiver-Foetus Relationship

This section will introduce the caregiver-foetus relationship, and consider how it links with the caregiver-infant relationship.

1.5.1 The Caregiver-Foetus Relationship

Before the 1940's and 1950's there was limited discourse around the concept that the caregiver-infant relationship may begin in pregnancy. However, at this time the idea began to be considered within the psychoanalytic community. Psychoanalysts hypothesised that the expectant mother invested her energy into the foetus both as an extension of the self and as a separate being (Deutsch, 1945; Bibring, 1959, in Brandon et al. 2009). In 1958, Winnicott described women becoming increasingly emotionally invested in and preoccupied with the foetus as it developed. Following this, Reva Rubin (1967) provided a theoretical construct of the maternal-foetal relationship. She noted

that there was an observable immediate tie between mother and infant following birth and reported that mothers shared that they felt they already knew their infant before birth. She argued that this meant that affectionate ties had been developing during pregnancy (Rubin, 1967, 1975).

Rubin (1975) and other notable early researchers such as Cranley (1981b) noted that women also described interactions with their foetuses, which provided further evidence that the relationship began before birth. Further support for the idea of an antenatal relationship came from research, which showed that the grief responses of mothers of infants who died at birth were not affected by whether they had physical contact with their baby post-delivery (Kennell, Slyter, & Klaus, 1970). Cranley (1981b) argued that this showed that “there is a qualitative change in the mother’s relationship with her infant at the time of birth, but by no means is it the beginning of their relationship” (p. 281).

In 1979 Cranley proposed a model of maternal-foetal attachment to describe the antenatal relationship. She defined it as, “the extent to which women engage in behaviours that represent an affiliation and interaction with their unborn child” (Cranley, 1981a, p282). Since this time the concept of maternal-foetal attachment has been redefined several times, most influentially by Müller (1990), Condon and Corkindale (1997), and Doan and Zimmerman (2002). Müller widened the focus of antenatal attachment to include the thoughts and fantasies of the mother (Müller, 1992; Müller & Ferketich, 1993). Condon and Corkindale defined it more generally as, “the emotional tie or bond which normally develops between the pregnant parent and her unborn infant” (p.359, 1997). Most recently Doan and Zimmerman (2002) have presented a further definition which attempts to detail further aspects of the topic. They describe it as an abstract concept which is used to represent the “affiliative relationship between a parent and fetus, which is potentially present before pregnancy, is related to cognitive and emotional abilities to conceptualize another human being, and develops within an ecological system” (p110).

Both antenatal and postnatal relationship theories and research have focused primarily and often exclusively on the mother. However, there is a growing interest in the transition of males to fatherhood (Brandon et al., 2009), and research into paternal foetal attachment is therefore increasing. Both Condon (1985) and Weaver and Cranley (1983) have argued for the concept of paternal antenatal attachment, and have

developed tools specifically to measure paternal antenatal attachment (Condon, 1993; Cranley, 1981a).

Research has tried to map the development of the caregiver-foetus relationship. Findings suggest that attachment begins from 10 weeks gestation (Caccia et al., 1991) and tends to increase over the course of pregnancy (Armstrong, 2002; Caccia et al., 1991; Damato, 2000). It increases rapidly in the second trimester (Rubin, 1975), particularly when the mother first feels the baby move (Bloom, 1995; Damato, 2000; Heidrich & Cranley, 1989). This initial perception of movement of the foetus in the uterus is known as 'quickening'.

1.5.2 Using the Term 'Attachment' in Describing the Caregiver-Foetus Relationship

The use of the term 'attachment' in relation to the caregiver-foetus relationship has been widely debated. Some researchers in the field now hold that antenatal attachment should certainly be seen as the beginning of the attachment relationship (Facello, 2008, Cannella, 2005) and measures of the caregiver-foetus relationship generally focus on the construct of antenatal attachment.

Others argue that the concept of attachment cannot be applied to the antenatal relationship. For example, Van den Bergh and Simons (2009) refer to the original descriptions of attachment as a reciprocal process and argue that because this is a unidirectional relationship the term is not transferable to this antenatal relationship. They also argue that the scales used to measure the relationship are limited as they do not include particular aspects of attachment, such as internal working models. Others suggest that antenatal attachment can be seen more as an emotional bond but is distinctly different to infant attachment (Pollock & Percy, 1999) and therefore there is no validity in using antenatal measures of attachment (Wilson et al, 2000). Those who support the concept of antenatal attachment refer to research findings which suggest that this is not a unidirectional relationship (Stainton, 1990). Others argue that mothers at least assume reciprocity, particularly during foetal imaging or in response to feeling the foetus moving (Brandon et al., 2009).

Finally, some suggest that there is a middle ground; the theory can be used antenatally if there is an understanding that antenatal and postnatal attachment are part of a

continuous process but have factors that make them distinct from each other (Turriff-Jonasson, 2004), and require “slightly different conceptual frameworks” (Laxton-Kane & Slade, 2002, p. 254). However, both include on the caregiver’s cognitive representations of their child and of caregiving, and the caregiver’s emotional response to their child.

The above arguments must be considered when researching the caregiver-foetus relationship. In particular it seems that the term ‘attachment’ has a somewhat different meaning when applied to the caregiver-foetus relationship compared to the caregiver-infant relationship. However, it is argued that the concept can still be used antenatally, firstly because it is the term that has been adopted by the researchers who developed and operationalised it as a construct and secondly because it is supported by research findings (Turriff-Jonasson, 2004). Indeed many key researchers in the field hold that attachment theory is a clinically meaningful and useful way to understand and explore the antenatal relationship (Brandon et al., 2009). This study was designed to be clinically meaningful and useful and therefore with a recognition of its limitations, the idea of antenatal attachment will be accepted for the purposes of this study.

1.6 The Connection Between the Caregiver-Foetus and Caregiver-Infant Relationships

A variety of studies have explored the connection between the caregiver-foetus and the caregiver-infant relationship, with the majority looking specifically at antenatal and postnatal attachment. Most studies (e.g. Müller, 1996) have found modest to moderate correlations between the two, suggesting that other factors were also impacting on postnatal attachment scores. It has therefore been suggested that one should be cautious about overestimating the impact of intervening at the prenatal stage to influence postnatal attachment. Damato (2004) found that depression, method of delivery, and need for admission to the intensive care unit moderated the effects of this relationship. These studies all utilised self-report measures.

Another factor which has been found to relate to antenatal and postnatal attachment is caregiver sensitivity. Shin et al (2006) found that antenatal attachment was the strongest predictor of postnatal maternal sensitivity and accounted for 31% of the total explained variance in maternal sensitivity. They also showed that maternal sensitivity

mediated the relationship between antenatal and postnatal attachment. They argued that as those with higher antenatal attachment reported higher maternal sensitivity, interventions should be conducted antenatally and should be focused on increasing antenatal attachment and sensitivity.

Other studies have used postnatal behavioural observations rather than self-report measures to explore a connection between the two. For example Fuller (1990) administered the MFAS to 32 women in their third trimester of pregnancy and then observed them feeding their infants on the second and third postpartum days. Ratings from these observations indicated a significant positive relationship between antenatal attachment and postnatal interactions. Siddiqui and Hagglof (2000) conducted a similar study and found a significant relationship between antenatal attachment and postnatal maternal involvement when interacting with the infant. They concluded that mothers who felt more affection and fantasised more antenatally, showed more active involvement during interactions. Other studies have found similar results (Bloom, 1995).

There are a limited number of studies which use measures of reflective functioning to research the link between the caregiver-foetus and caregiver-infant relationship. Benoit, Parker, & Zeanah (1997) administered the Working Model of the Child Interview (WMCI; Zeanah et al, 1994) antenatally to 96 expectant mothers. This interview measures mothers' representations of caregiving, such as sensitivity towards their infant and sense of competence as a caregiver. When infants were 1 years old, they re-administered the WMCI and also conducted the Strange Situation test. They found a significant relationship between participant's antenatal representations of their infants and classifications of attachment from the Strange Situation. They concluded that antenatal representations could affect how caregivers perceive and therefore interact with their infants after birth, which could then impact on attachment security. These findings were repeated in a similar study (Huth-Bocks, Levendosky, Bogat, & von Eye, 2004).

Other studies have found less encouraging evidence for a connection between the caregiver-foetus and caregiver-infant relationships. For example, Mercer and Ferketich (1990) found that antenatal attachment scores predicted early postnatal attachment but did not predict postnatal attachment at 8 months postpartum. This suggests that antenatal attachment may be a better early predictor of postnatal attachment but that other factors play a more significant role in changing the nature of attachment over time.

For example, several studies have shown the impact of the following factors on the caregiver-infant relationship: social support (Crittendent, 1985), demographic risks (Belsky, 1999) such as poverty and low socioeconomic status (Halpern, 1993) and experiences of domestic violence (Zeanah et al, 1999).

In conclusion, although inconclusive, studies generally seem to suggest that there is a connection between the caregiver-foetus and caregiver-infant relationships (Brandon et al., 2009).

1.7 The Impact of the Caregiver-Infant and Caregiver-Foetus Relationship

The relationship between caregivers and their infants has long been recognised as one of the most important factors affecting mental health and well-being across the lifespan. In their review of relevant research Shonkoff and Philips (2000) argue that the environment which caregiver's provide affects almost all aspects of development, "ranging from the health and integrity of the baby at birth to the child's readiness to start school at age 5" (p27). They describe the relationship as the "building blocks" of development and as mediating successful human adaptation.

It would not be possible to explore the impact of the relationship on every aspect of development; therefore this section will particularly look at the issues that are most relevant to the field of clinical psychology. These are; the impact on brain development, emotional skills such as sensitivity and empathy, relationship formation, intergenerational effects and mental health. Other important factors that are referred to but are not discussed in as much detail include antisocial and criminal behaviour and educational ability and achievement. Further factors which have not been discussed here but would be particularly of interest to the field of clinical health psychology are health related behaviours including drug use (e.g. Garnier & Stein, 2002) and physical health (e.g. Waylen, Stallard, & Stewart-Brown, 2008).

1.7.1 Brain Development

The development of an infant's brain appears to be significantly impacted by the relationship with their caregiver. The brain of a newborn baby is extremely immature and adaptable at birth and continues to be so for the first 2 years of life. This is a

strength and a vulnerability, as it means that infants can adapt to their environment to survive, but the external environment has an immense impact on brain development. This is where the impact of the caregiver is important, as to a great extent they *are* the external environment, regulating the experiences that the infant is exposed to, which in turn impacts on their nervous system (Schore, 2001). It is suggested that these early experiences directly impact on brain structure and chemistry from gestation, and in particular in the first month of life (Karr-Morse & Wiley, 1997). Therefore an individual's brain potential is massively influenced by the quality of the support that is provided by their caregiver in the early years (Allen & Duncan Smith, 2008). Unfortunately this means that caregivers who do not provide a safe and secure relationship for their infant can impact on their brain structure, nervous system and stress hormone regulatory systems (Stewart-Brown & Schrader McMillan, 2010).

Neuroscientific research provides an understanding of how this process works. At birth, human brains have billions of cells (neurons) and trillions of connections between these cells (synapses) (Perry, 2002). In a process known as 'apoptosis', many of the neurons die and in 'synaptic pruning', those synapses that are rarely used die (Perry, 2002). Those synapses that are regularly used remain and simultaneously, other synapses are formed as a result of experiences. Caregiver interactions impact on the structure and number of neurons and synapses in the brain, and stimulation, particularly touch, is considered vital for brain development. For example, when looking at computed axial tomography (CAT) scans of the brains of people with nurturing early experiences compared to those with neglectful or under-stimulated experiences, research has found that the brain overall is significantly smaller in the latter group (Perry, 2002, see figure 2). There are fewer synapses and both the hippocampus and the limbic systems are smaller.

Fear-inducing relationships have a significant impact on brain development and related future behaviour, especially the brain's response to threat. At birth all humans are very responsive to stimulation and danger. Even simple activities such as undressing an infant will lead to an increase in cortisol, a hormone that is released in times of stress. Infants whose caregivers respond so that they feel reassured and safe may still cry when put in stressful situations but will not produce as much cortisol (Gunnar & Donzella, 2002). However, infants with caregivers who interact in such a way that they do not feel safe are left over-aroused or anticipating danger. They tend to release high

levels of cortisol. This increases the level of activity in the 'locus coeruleus', which means that infants become particularly sensitive to threat in the future (Perry, Pollard, Blakley, Baker & Vigilante, 1996). Therefore even when there is only a slight trigger relating to threat, the infant will experience a quick increase in cortisol and other related hormones, and will respond impulsively and anxiously, as if under high levels of threat. Studies have shown that children who are traumatised in this way can show various physical responses to fear even when in a safe and calm situation, such as high levels of cortisol in the blood and a high resting heart rate. Children in this cohort are more likely to show poor ability to self-regulate and show more behavioural, social and learning difficulties (Perry & Szalavitz, 2006).

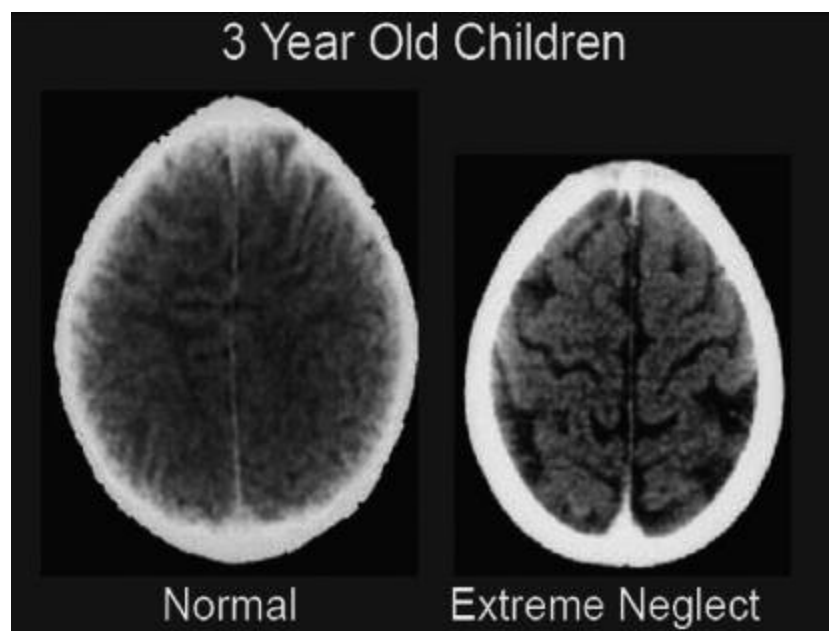


Figure 2: A CAT scan showing differences in brain development between 3 year old children with different caregiver-infant relationships (Perry, 2002).

One factor that is relevant to this study is that the brain becomes increasingly inflexible over time. Therefore behaviours and perceptions which develop in this early period are increasingly resistant to interventions promoting change. Schore (2001) suggests that the impact of these early events are literally imprinted onto the maturing neurobiological structures at the time, and have long-term effects on the infant.

In conclusion, research has shown that early experience as regulated by the caregiver significantly shapes the developing brain, which has far-reaching impacts on many aspects of infant development. Over time and due to other psychological processes, the brain becomes increasingly inflexible, therefore an infant will continue to behave in particular ways even if their caregiver environment changes (Balbernie, 2001).

1.7.2 Sensitivity and Empathy

As referred to in section 1.4.1, the development of sympathy, empathy and emotional attunement has been shown to be affected by the caregiver relationship. It is thought that the 'sensitive window' for learning empathy and emotional sensitivity is in the first 2 years of life (Shore, 1997). It is proposed that if this does not occur during the sensitive window, the infant may struggle to learn these skills in the future. The developing capacity for this emotional skill can be observed in the early years (Main and George, 1985).

Goleman (2006) describes the enormous impact of these emotional skills, saying that they impact on, "a vast array of life arenas, from sales and management to romance and parenting, to compassion and political action...Its lack is seen in criminal psychopaths, rapists, and child molesters" (p97). As suggested in the above quote, the limited ability to feel empathy and compassion for others has been strongly linked to future anti-social and violent behaviour. In examining the roots of violence, Karr-Morse and Wiley (1997) suggest that a secure attachment relationship between caregiver and infant provides three key protective factors that diminish the likelihood of later violent behaviour. These are; learning empathy or feeling emotionally attached to others, the opportunity to develop higher levels of cognitive functioning and the possibility of learning affect regulation, particularly in relation to destructive emotions.

1.7.3 Relationship Formation and Intergenerational Impact

Although it is by no means the only factor affecting relationship formation, the relationship that a caregiver forms with their foetus and then their infant is thought to impact on all future relationships that the infant has (Fonagy, Steele & Steele, 1991; Schore, 1994). It is thought to do this by affecting an individual's sense of empathy and

sensitivity but also their sense of self, communication skills and self-control (Balbernie, 2001).

If the early caregiver relationship impacts on all future relationships, it follows that there will be an intergenerational impact of the relationship. Fonagy, Steele, & Steele (1991) found strong support for this hypothesis in their study. They used the Adult Attachment Interview which measures adult's attachment to their own caregivers. They administered this to 100 expectant first-time parents and a year later observed them with their infants. They found that maternal attachment classifications (autonomous, dismissing or preoccupied) and capacity for reflective functioning strongly correlated with infant-mother attachment patterns (secure or insecure). Further studies have found similar results (Mikulincer & Florian, 1999; Priel & Besser, 2000). It seems that Bowlby's assertions regarding the intergenerational impact of the relationship were correct (1973). It is also of interest that those who report better relationships with their caregivers also report better romantic relationships (George & Solomon, 1999). Those with stronger romantic relationships are also more likely to show more sensitive parenting (Belsky & Cassidy, 1994).

1.7.4 Mental Health

It has been suggested that the relationship has an intergenerational impact on mental health. This has been supported by a body of research into antenatal and postnatal relationships.

Parents with mental health needs appear more likely to experience difficult relationships with their foetus and later their infant. For example, Pollock and Percy (1999) found that a classification of "negative preoccupied" on an antenatal attachment scale correlated with anxiety and depression symptoms, and unfortunately also correlated with foetal abuse, a finding which has been observed elsewhere (e.g. Moncher, 1996). Mothers with chronic depression are more likely to show insecure-disorganised attachment relationships than those without chronic depression (Teit, 1995), though of course other factors may be influencing this outcome. Studies show that infants with caregivers experiencing difficulties can show recognisable signs of anxiety and depression within the first year of life. For example, they may show higher right frontal lobe activity - an area linked to depressive emotions, higher cortisol levels (Field, Healy, Goldstein, Perry,

& Bendell, 1988) and decreased activation of the left lobes - an area linked with positive emotions (Dawson, Hessler, & Frey, 1994). This can also be observed in young infants; one study found that babies of only 3 months whose mothers had a diagnosis of depression showed more expressions of sadness and less interest in objects than those with non-depressed mothers (Pickens & Field, 1993). This suggests that infants who experience difficult relationships with their caregivers may be more likely to develop mental health needs.

It has been argued that having caregivers with a capacity for reflective functioning affects the capacity for their infant to develop reflective functioning skills (Slade, 2005). A further argument is that infants who do not learn this skill are at higher risk for developing mental health difficulties. For example, researchers have argued that there is a relationship between impairments in reflective functioning and the development of borderline personality disorder (Fonagy et al., 1995; Fonagy, Gergely, Jurist & Target, 2002). Problems with reflective functioning have also been linked to other areas in the field of mental health, such as psychosis (Versmissen, et al., 2008), drug abuse (Levy & Truman, 2002) and impairments in social skills (Levy & Truman, 2002). The argument that parental reflective functioning affects infant and child development has led to the development of new clinical approaches, described as mentalization-based treatment. They have been developed for families (Fearon et al., 2006), mother–infant dyads (Sadler, Slade & Mayes, 2006), and schools (Twemlow, Fonagy, & Sacco, 2005).

The related concept of affect regulation has also been steadily increasing in importance when considering the caregiver-infant relationship and mental health. For example, Bradley (2000) argued that affect regulation is a key factor of human development and that affect dysregulation can lead to mental health difficulties. She related affect dysregulation to diagnoses of anxiety and mood disorders, psychoses and personality disorders. Schore (2001) argued that the regulation of emotion underlies attachment and impacts on the development of the regulatory systems in the brain, which regulate cognition, behaviour and affect. He therefore sees affect regulation as a major factor affecting mental health throughout the lifespan.

This section is not attempting to argue that the caregiver-infant relationship is the only factor which affects mental health; indeed many other factors have been found to have an impact, such as physical wellbeing or experiences of loss. However, the findings of

the studies referred to above have been used to argue that the relationship could be a factor which has an impact on mental health.

There is also argued to be a wider social impact of the relationship, which relates to its impact on behaviour. Speltz et al (1990) note that children with an insecure attachment relationship can show behaviours such as aggression and non-compliance, which leads to an increasing need for statutory services. Greenberg et al (1997) note that “the social and economic costs of these types of disorders are staggering” (p197).

In this section, evidence has been used to argue that there is a powerful and enduring impact of the caregiver foetal and caregiver infant relationship over the lifespan (see figure 3). The impact of the relationship becomes increasingly permanent as the brain develops and behaviours and attitudes become practised and entrenched. This has led many to argue for early interventions which focus on fostering a secure relationship (e.g. Balbernie, 2001; 2008, Brandon et al., 2009). In their role as politicians, Allen and Duncan-Smith (2008) argued that “what we do to prepare at-risk parents and potential parents to be effective is the most important social policy issue for modern society”.

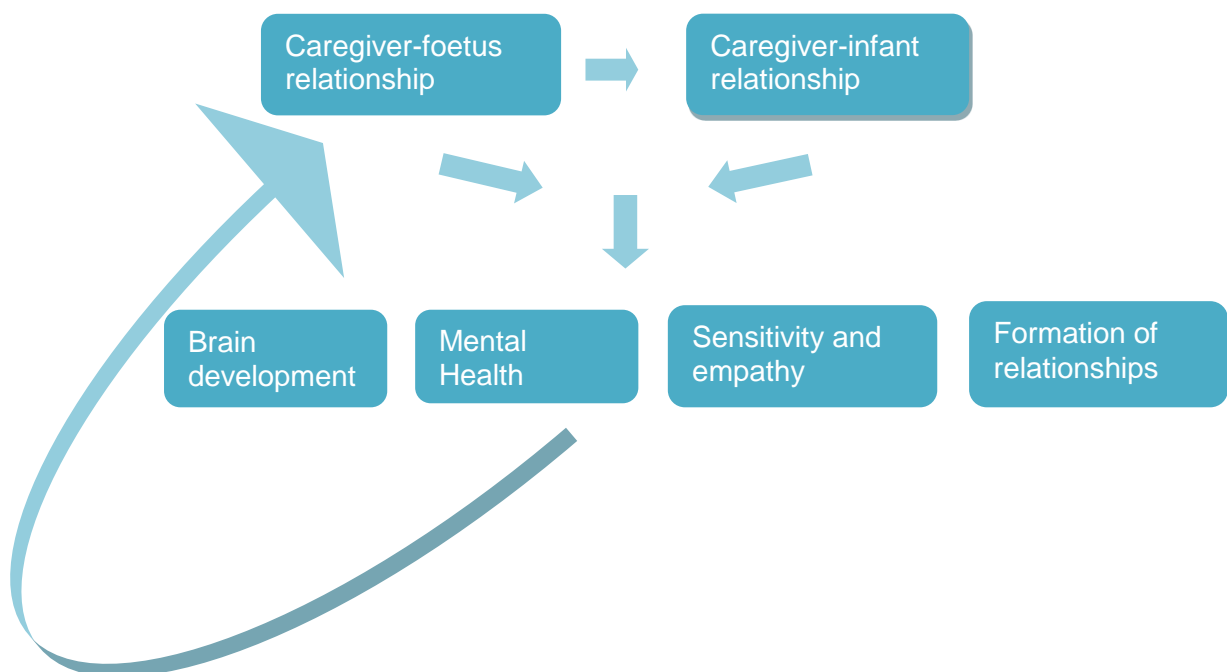


Figure 3: The impact of the caregiver-foetus and caregiver-infant relationship

1.8 The Argument for Antenatal Interventions

This study has argued that optimal infant development is dependent to a great extent on “good enough” caregiver-foetus and caregiver-infant relationships, and that the relationship impacts on factors such as mental health, cognitive ability and self-esteem throughout the lifespan and across generations. It follows that there is a need for services which reduce the risk of difficult early relationships and promote the development of positive ones. There is also an economic argument for providing early intervention services. Early childhood interventions promoting healthy development have been found to lead to impressive savings. For example, Farrell (2002) suggests that the return on early childhood intervention is approximately 15% and Caldwell (1992, 2005) calculates that the cost of child maltreatment is 19 times higher than implementing a universal preventative intervention for new parents. Research into early interventions for high-risk families has also shown that over time the financial benefits outweigh the costs (Bruner, Goldberg, & Kot, 1999). Heckman (2002) who was the Nobel Laureate in Economic Sciences in 2000 said, “The real question is how to use the available funds wisely. The evidence supports the policy prescription: invest in the very young”.

There are a large number of postnatal psychological parenting interventions which focus on the caregiver-infant or caregiver-child relationship to improve areas such as behaviour or anxiety management (e.g. Webster-Stratton, Reid, & Hammond, 2001). These interventions most often include caregivers as a key element of the work (Balbernie, 2002), as this relationship appears to have such an impact on infant development (Solchany and Barnard, 2001). Reviews of their effectiveness have found some positive results (e.g. Barlow et al, 2003). However, there are many arguments as to why *antenatal* interventions are an appropriate and effective way of working on the relationship, which shall now be presented.

1.8.1 Promotion and Prevention

The National Health Service (NHS) has traditionally focused much of its resources on *responding* to mental health needs; however there has recently been a paradigm shift from this towards a more preventative approach. This is based on attempts to find a more efficient use of resources and to promote quality of life. At the launch of their early

intervention programme in 2008 the Nottingham council leader Jon Collins said they had changed their approach and were asking “How do we get upstream, rather than just dealing with the problems when they arrive fully formed downstream?”. Antenatal interventions to improve the caregiver-infant relationship have the benefit of two possible outcomes in relation to the mental health of caregivers and infants; firstly the promotion of mental health and secondly the prevention of future mental health difficulties. A report by the World Health Organization (2004) identifies the difference between the two in relation to outcome goals. It notes that promotion aims to increase psychological well-being and create supportive living environments, whilst prevention aims to reduce symptomatology and diagnoses. It also notes that both elements often exist within the same programmes.

It appears that interventions in the antenatal period are a timely approach for both prevention and promotion; indeed Müller (1990) argued that many difficulties between caregivers and children could have been solved if they had been addressed during the antenatal period. Slade (2002) adds further weight to this argument, writing that difficulties in the caregiver-infant relationship almost always begin in pregnancy, and uses this to argue that intervention antenatally is both timely and critical.

1.8.2 The Potential Impact of Antenatal Interventions

Evidence suggests that programmes that begin either antenatally or at birth have a substantial and sustained effect (MacLeod & Nelson, 2000). One reason suggested for this is that at this point expectant mothers are approached before they feel they are failing, which makes them more likely to attend the intervention. Another reason suggested is that the longer an infant is in an emotionally challenging environment the more they will develop attachment-related difficulties. These will become increasingly entrenched the longer they remain in that environment (Balbernie, 2001), although other factors might protect them from this. Therefore, more resources and time will be needed to effect a positive change. It follows that the most effective intervention would be a measure that aims to prevent this difficult environment occurring at all rather than a reactive approach. In his overview of early interventions, Professor Fonagy (1998) concluded that there was strong support for preventative approaches. He summarised that in the short term the interventions could improve, “...the child’s health and welfare”

and also noted benefits for caregivers, such as, "...enhanced self-efficacy as parents and improved relationships with their child and partner" (p132).

1.8.3 Service User Perspective

Another argument for the implementation of antenatal interventions comes from research with service users. The NHS is increasingly listening to the voice of service users and respecting that they have knowledge of what they need. The NHS Plan (Department of Health, DoH, 2000) showed the government's vision for a patient-centred NHS which responds to the needs of service users. This has continued to be a focus in current policy (DoH, 2011).

Several studies have explored the antenatal experience of service users. One survey found that expectant mothers would like information on how to care for their baby following birth (Sullivan, 1993), while the NICE commissioned clinical guidelines on antenatal care (2008) found that both men and women wanted more information about the postnatal period in their antenatal classes. Indeed, 86% of those surveyed postnatally requested this in response to an open-ended question. Barnes et al (2008) interviewed 151 new mothers about their antenatal experiences. Participants said that antenatal classes focused too heavily on the birth and insufficiently on the postnatal period. Other studies support the finding that expectant parents would like more information to be provided about parenting antenatally (Ho & Holroyd, 2002; Renkert & Nutbeam, 2001; Schneider, 2002), and after antenatal classes feel overwhelmed and underprepared for after the birth (Nelson, 2003).

In support of this, Parr (2009) argued that traditional antenatal classes, which focus on childbirth and practical aspects of infant care, do not significantly impact on the ability of caregivers to develop a secure attachment with their infants. It seems that there are very few opportunities and contexts for caregivers to learn about what might occur following birth (Deave, Johnson, & Ingram, 2008) and to develop skills in the caregiver-infant relationship. As a result of his meta-analysis of service-user studies, Nelson recommended interventions which have "a proactive, honest, reality-based approach aimed at altering maternal expectations" (p. 476) which would also allow for discussion about feeling exhausted and overwhelmed in a normalising and reassuring manner. These views of service users have influenced the development of this study.

1.8.4 Decrease in Family Support

It has also been noted that the existence and increase of antenatal interventions in the UK may have been a result of the decline in community and family networks, where information would traditionally have been shared and passed on (Gagnon & Sandall, 2007). It is possible that as this isolation has increased, the need for antenatal support has also grown and is becoming a necessity for the increasing number of isolated expectant parents.

1.9 A Critical Review of Relevant Studies

This study has presented several arguments explaining why antenatal interventions *should* be useful. This section will outline antenatal interventions that focus on the caregiver-foetus and caregiver-infant relationship and critically review the research in this area to see if they *are* useful. The interventions below have been split according to their format and focus, for example if they focus particular on fathers or attachment. A meta-analysis of the research in this area is also presented.

1.9.1 Maternal-Foetal Awareness and Activities

Several studies have researched the impact of maternal-foetal activities on expectant mothers' awareness of their foetus, and subsequently on attachment (Mercer & Walker, 2006). Carter-Jessop (1981) found a significant relationship between increasing awareness of the foetus and attachment. Ten expectant women participated in this study, of which 5 were randomly allocated to an intervention group and 5 to a control group. The control group received standard antenatal care. The intervention consisted of encouraging participants to notice and interact with the foetus in several ways, such as talking to and soothing the foetus, noticing the position of the foetus each day, and pressing gently on the abdomen and notice the effect on the foetus. Postnatal attachment scores were based on observations of maternal behaviours such as eye contact and talking to the infant. A significant difference in scores was found between the two groups, and this led Carter-Jessop (1981) to suggest that the antenatal intervention increased postnatal attachment. However Carson and Virden (1984) conducted a study with a larger sample size, in which one group received the Carter-Jessop antenatal intervention, and the other received instructions regarding using relaxation techniques whilst in labour. They found no difference between the two

groups, a finding which was replicated by Davis and Akridge (1987). Significant differences were found between Caucasian and Black mothers in frequencies of attachment behaviours, implying that there may be cultural differences in what has been defined as attachment behaviour.

Another intervention to increase foetal awareness which has received some interest, is foetal counting, where the participant is asked to focus on their foetus and count the number of times that they feel it move. In a study with 213 expectant mothers, Mikhail et al (1991) used Cranley's (1981) Maternal-Foetal Attachment Scale and found a significant difference in self-reported antenatal attachment scores between the experimental group, who counted foetal movements, and the control group. Koniak-Griffin and Verzemnieks (1991) conducted a similar study with adolescent expectant mothers. They found that those who received the intervention showed a significant increase in self-reported antenatal attachment, but showed no difference in mothering behaviours compared to those in the control group. However, this study was only conducted on twenty young people and Gagnon & Sandall (2007) state that a small sample such as this can limit the value of the findings.

1.9.2 Father-Focused Research

A very small number of studies have specifically focused on fathers in the antenatal period. Dachman et al (1986) conducted an in-depth study exploring two interventions; the first being antenatal and the second postnatal. The antenatal intervention used a doll to explain and teach skills for looking after newborns, and the postnatal intervention used the father's newborn babies within the first few months of life to do the same. Six fathers participated in the study, and of these only three participated in the antenatal doll intervention. Both studies also taught a range of infant stimulation skills, such as repeating the sounds that their baby makes and gently rocking their baby. Dachman et al (1986) found that attending either intervention led to a high percentage increase in care skills and also increased the frequency of infant stimulation events by fathers. Although this study produced very positive results, it is subject to key limitations, the central one being the small sample size. Therefore although the study gave a detailed explanation of the development of the intervention and the outcomes, it is difficult to draw many conclusions or generalise the findings.

One randomised controlled trial (RCT) (Pfannenstiel & Honig, 1991) explored the effectiveness of an antenatal intervention on expectant first-time fathers with a low socioeconomic status. The intervention included content on newborn care and behaviour, parent-infant sensitive interactions and typical child development. They found that fathers who had attended the intervention were significantly more sensitive with their infants than those in the control group. This study has some limitations; firstly randomization procedures were not described and also the content of the control sessions were not described.

Although the findings from this limited number of studies suggests that antenatal interventions could have a positive impact on expectant fathers, much of the research into fathers and antenatal care has focused on the failure of services to include fathers and provide a space for them to discuss related issues (McElligott, 2001; Pollock, 2001). The Fatherhood Institute (2008) has put forth similar criticisms, and suggests that fathers are marginalised during pregnancy and beyond.

1.9.3 Knowledge-based classes

Svensson, Barclay and Cooke (2009) conducted a RCT comparing a new antenatal intervention to standard classes in Australia. They found that those who attended the new intervention scored significantly higher on postnatal parenting self-efficacy and perceived parenting knowledge. Worry scores were also lower for this group though this finding was not statistically significant. (Svensson, Barclay, & Cooke, 2009)

1.9.4 Attachment-based classes

A very small number of studies have explored the impact of attachment-focused interventions based in the community. They have drawn on the theories described earlier in the introduction, such as caregiver sensitivity and affect regulation.

Bryan (2000) conducted a study in this area using a non-randomised convenience sample. She compared 35 expectant couples to a control group. Those in the intervention group attended three classes in addition to their standard childbirth classes. The classes focused on the change to the individuals and the couple, how infants communicate and the first 3 months of life. Postnatal analysis of results using a parent-

child interaction measure highlighted several encouraging findings. For example mothers attending the intervention sessions showed higher sensitivity to cues, fathers showed higher scores in social-emotional growth fostering, and couples showed higher scores in response to child distress. However, the study is limited by its sampling method which could have led to biased findings.

Another recently published study (Bellieni et al., 2007) assessed the impact of an antenatal intervention which consisted of 5 1-hour lessons in the first and second trimesters of pregnancy. Seventy-seven expectant mothers were assigned to either the intervention or control groups. Topics in the intervention included foetal physiology and development, singing sessions, dance sessions and massage-through-the-womb sessions. The study found that attendance at the antenatal education course led to higher antenatal attachment scores. However they suggested that more studies are needed to assess whether this type of intervention could be useful for the development of the caregiver-infant relationship.

Most recently Haworth and Hickson (2010) wrote about a pilot study into a low-cost antenatal intervention. The intervention consisted of three workshops, with the third being conducted between 6-8 weeks post birth. The intervention aimed to increase first time mothers' awareness and understanding of the emotional development of infants, and the importance of forming a secure attachment with their baby. It also aimed to help first time mothers feel more confident and skilled in establishing the beginnings of a secure attachment with their baby. Thirteen first-time expectant mothers attended the intervention workshops and completed questionnaires regarding their impact. Findings suggested that this low-cost community-based intervention could be helpful in improving the attachment relationship. However, this study did not have a control group, was based on small numbers and did not use a standardised measure. The authors recommended that research into its effectiveness needs to be conducted on a larger scale.

1.9.5 Perinatal Interventions

Several studies have looked at larger-scale interventions based on home visits that begin antenatally but continue into the postnatal period. Parr (1998) conducted a UK-

based study into the effectiveness of a perinatal attachment-based parenting programme for low-risk expectant mothers and fathers. This non-randomised controlled trial found that those attending the intervention showed a significant increase in satisfaction with the parent-infant relationship, psychological well-being and confidence as a parent. An RCT in 2007 (Barlow et al), reported that pregnant women in families at risk of abuse and neglect benefited from a weekly home visiting service from 6 months gestation to 12 months after delivery. Statistically significant improvements were reported in both maternal sensitivity and infant cooperativeness.

De la Rosa, Perry, Dalton, & Johnson (2005) conducted a study into the impact of another home-visiting programme that covered the perinatal period. In their study of the First Born Program (FBP) which covers an impoverished area in New Mexico they looked at the outcomes of 109 families. The programme covered topics such as the importance of bonding, interactions which support development and father involvement. Their analysis of pre and post intervention measures showed that attending the program led to significantly higher scores of family resiliency. Raters also noted that caregivers were more appropriately understanding and responding to their baby's expressions and behaviours in comparison to pre-intervention.

An RCT into a similar programme for expectant adolescents (Olds et al, 1997; 2002) found that there were several very successful outcomes of the interventions across generations. In the first 4 years following the intervention, mothers used less punishment, had significantly higher rates of employment and the children had higher IQ scores. By the age of 15 there were lower punishment rates and young people were 56% less likely to have problems with alcohol or drugs, there were 56% fewer arrests and 81% fewer convictions were reported. Mothers also had 30 fewer months on welfare compared to those in the control group. At the 15-year follow up they found that savings from the programme exceeded the costs by a factor of 4.

The World Health Organisation (2004) reports successful replication of this intervention in America and Europe, with higher effectiveness for expectant parents with high levels of mental health needs. However, they also warn that some home visiting programmes have not been effective (Villar et al., 1992 cited in WHO, 2004) and therefore note that it is important to discover what the factors are in the interventions that are enabling them to be effective, or which are preventing effectiveness. They recommend that further

research is conducted in this area. It is also important to note the costs involved in setting up the service. Whilst cost-benefit analyses have shown impressive results, governments can be reluctant to invest initial capital when the outcomes are not certain.

1.9.6 Meta-Analyses

MacLeod and Nelson (2000) conducted a meta-analysis of 56 antenatal and postnatal programs that attempted to promote family wellness, which they closely related to attachment relationships, and prevent child maltreatment. They found that most interventions successfully achieved their aims, with an overall mean effect size of 0.41. They identified several factors that moderated program success. Of the group programs, those with the second and third highest effect sizes began antenatally or at birth. This finding supports the idea that the earlier an intervention begins, the better. A second interesting finding was that proactive interventions had larger effect sizes at follow-up than immediately post-intervention, with the opposite finding for reactive interventions, suggesting that outcomes from proactive interventions are sustained whilst those from reactive interventions fade. A number of possible reasons are given for this, however they note that it is possible that proactive interventions are likely to begin a “positive chain of events and thus break the pattern of a downward spiral” (p1143). They suggest that this is an important finding for policy makers, who should focus on proactive rather than reactive interventions.

1.9.7 Limitations of the Research

As discussed, it has been suggested that the caregiver-foetus and caregiver-infant relationships have a far reaching impact on infants, including their mental health, and is an important area for psychological research. The studies presented above suggest that interventions aimed at developing this relationship could be effective. However, several limitations of this area of research are apparent. Though the specific limitations of individual studies have been included in the presentation of these studies above, the area of research has been subject to more general criticism which limits the reliability, validity and generalisability of findings.

Salisbury et al (2003) note that there are relatively few studies in the area of maternal-foetal attachment, despite its potential importance. They argue that the research that does exist is insensitive to cultural issues and is based on small and homogenous

samples. Shieh, Kravitz and Wang (2001) provide a similar argument. They note that the psychometric data which was used to develop antenatal attachment measures was largely based on samples of middle-class, married and low-risk Caucasian women. They argue that future research should combine qualitative and quantitative measures, in order to widen the theoretical understanding of the concept. In her review of maternal-foetal attachment studies, Cannella (2005) notes that the majority of studies reviewed were based in America despite the fact that the research area could have significant implications for expectant parents worldwide. She argued that studies must be conducted internationally and should include developing countries in order to identify cultural differences in maternal foetal attachment. Brandon et al (2009) note that this lack of research with diverse populations strongly limits existing knowledge, and that conducting studies with other populations could reveal further factors within the construct of maternal-foetal attachment that could be clinically useful.

Other flaws in the research area have been identified. Salisbury et al (2003) note that research is limited because the operational definition of maternal-foetal attachment is often inadequate. Brandon et al (2009) they suggest that research needs to move away from single time-point data collection. They also observe that older studies often do not contain all the baseline information that is required to decide if findings are valid, reliable or generalisable. Finally they argue that there has been an inconsistent use of methods across studies and that the psychometric properties of some of the measures have not been consistently valid or reliable.

The Department for Children, Schools and Families (DCSF) commissioned a comprehensive review of evidence entitled "Health-led Parenting Interventions in Pregnancy and Early Years" (Barlow et al, 2008). The aim was to identify the most effective parenting support services and programmes in pregnancy and beyond. Due to all of the above limitations it was noted that there is only limited evidence (in terms of both quality and quantity) about the effectiveness of antenatal group-based programmes. However, they assert that the evidence so far suggests that "interventions... have the potential to improve a range of outcomes such as dyadic adjustment, maternal psychological well-being, parental confidence, and satisfaction with the couple and parent-infant relationship in the postnatal period" (p7).

1.9.8 Recommendations

Several recommendations have been made regarding future research. There is a need for further studies with clear operational definitions, improved measurement of the relationship (Salisbury et al, 2003), and which use qualitative and quantitative measures, involve a more heterogeneous sample and consider cultural issues. It has also been recommended that further intervention studies should be conducted in order to examine their impact on the relationship throughout pregnancy (e.g. Van den Burgh and Simons, 2009) and beyond (e.g. Bellieni et al, 2007, Barlow et al, 2008).

In their review of antenatal education Gagnon and Sandall (2000) similarly suggest that further research be conducted due to inconsistent results in research so far. The DSCF review (Barlow et al, 2008) notes that due to limited evidence there is a need for further research “to assess the effectiveness of antenatal parenting programmes in supporting pregnant women and their partners to prepare for their future role as parents” (p7).

Facello (2008) suggests that further research should be conducted to explore precursors to attachment and what health care professionals can do to promote the attachment relationship. Brandon et al (2009) and Salisbury et al (2003) similarly emphasise the importance of learning more about what facilitates the growth of antenatal attachment and what may prevent it. Also from a more exploratory approach, Schneider (2002) argued that antenatal education is highly valued by those who would otherwise have little opportunity to learn about the area in their own social environment. She argued that research into antenatal educational classes should be conducted and could inform educators firstly if classes impact on parenting, and if so, how they have an impact.

Finally, the criticisms reported earlier regarding the marginalisation of fathers leads to a recommendation that fathers are included as much as possible in antenatal studies.

1.10 Rationale for the Study:

The recommendations above provide a rationale for conducting further research into the impact of an antenatal intervention on the caregiver-foetus and caregiver-infant relationship. In addition to these recommendations for further research, other factors provide a rationale for the current research, which have been discussed earlier. This includes economic arguments, responding to the views of service users and the potential impact of antenatal interventions. In addition, it has been argued that as we

develop our understanding of the potential impact of the caregiver-foetus and caregiver-infant relationship, our responsibility to develop useful interventions in this area also increases (Brandon et al, 2009).

In relation to this study, it appears that there is a lack of research investigating the impact of antenatal interventions using a group psychoeducational approach, particularly for a British sample and which employs both quantitative and qualitative research measures.

In conclusion, evidence for interventions attempting to improve the caregiver-infant relationship supports the assertion that appropriate interventions could lead to positive changes in the relationship. There are political, social, economic and research-based arguments for conducting further research into the impact of a psychoeducational antenatal intervention on the caregiver-infant relationship. Therefore this study aims to both develop and pilot an antenatal intervention which focuses on enhancing the caregiver-foetus and caregiver-infant relationship, and explore its impact on a diverse sample in England.

Following from the arguments posed above, the hypotheses for this study are that:

- 1) Attendance at the intervention class will lead to higher scores on a measure of self-reported antenatal attachment than attending standard classes only.
- 2) Participants with high scores on the Parental Bonding Instrument (PBI; Parker et al, 1979), indicating high levels of bonding with their own parents, will have higher scores on a measure of self-reported antenatal attachment.

The study also aims to qualitatively explore the experience of attending the antenatal intervention group.

2 Method

2.1 Design

This pilot study utilises a prospective, randomised controlled trial (RCT) design. A between and within subjects design was used, in that the intervention and control groups were compared to each other (between subjects design) and changes over time within each group were also measured (within subjects design). An RCT allocates participants at random to the intervention and control groups, which ensures that these two groups are statistically equivalent.

RCT's are often considered the best design for establishing strong evidence for a causal relationship between factors. However, it is difficult to meet all the conditions for a RCT in a community setting where many contextual factors are not controllable (Saxena, Jane-Llopis, & Hosman, 2006). It was felt it could be managed by measuring as many of the mediating or extraneous variables as possible, and that there was a necessary compromise between internal and external validity.

Independent Variable

Attendance at the Baby World antenatal class.

Dependent Variables

Antenatal attachment scores on the Maternal Antenatal Attachment Scale and Paternal Antenatal Attachment Scale

Points of measurement

(see figure 6 for more information)

- 1) Baseline (upon recruitment)
- 2) Post 3-hour intervention/equivalent time point for control group
- 3) Post 1-day/3-evening standard antenatal classes

2.2 Participants

2.2.1 Recruitment

Participants were expectant parents in a London borough who were registered patients of a London NHS Trust Perinatal Service and had registered to attend their local NHS antenatal classes between December 2010 and April 2011. Recruiting from a diverse borough in London addressed a key concern regarding lack of heterogeneity in previous samples, as outline in section 1.9.8 above. Therefore the study increased its ecological validity, and results had the potential to be more generalisable than previous studies.

The staff in this service had been informed of the study through two presentations and discussions in their team meetings. They had agreed that the study could recruit their patients subject to ethical approval. All those who met the study criteria (see inclusion and exclusion criteria overleaf) were to be told about the study by their midwife, who gave contact details to the researcher; they were then telephoned by the researcher. In this conversation the study was explained in some depth, including the purpose of the study and what might be involved. Participants were told that researchers were interested in the impact of a new antenatal class. Participants were then invited to ask any questions.

Those who expressed an interest or consented to participate were provided electronically with an information sheet (appendix 1) and consent form (appendix 2), followed by a link to the first set of questionnaires once they had consented. This included a demographic questionnaire. Once informed consent was given the participant was randomly allocated to one of the two study conditions; intervention or control. The consent form included information regarding informed consent, the limits to confidentiality regarding risk and a participant's right to withdraw from the study at any time.

As part of the initial telephone conversation, potential participants were informed that they would be asked to complete questionnaires at 3 different time points (see section 2.1) and that their partners could be involved. Following informed consent participants were asked to speak to their partners, and provide contact details for them if they were

interested in being contacted. When contact details were provided, the partners were given the same information regarding the study and invited to participate in the same way as their partners.

Randomised Allocation

Participants were randomly allocated to either the control or intervention group through the use of a random list of numbers generated on the computer program www.randomizer.org. Once participants had consented to take part in the study they were given the next available participant number from a list. The list generated by the computer program was then checked to see which of the two groups this participant number was in. The participant was then assigned to the appropriate group. Seven participants who completed the study were originally assigned to the experimental group. However due to reasons such as illness, family difficulties and a household emergency they were unable to attend the group. Any further completed data sets at the second and third time points from these participants were therefore excluded from analysis to remove a potential source of bias.

2.2.2 Inclusion and Exclusion Criteria

The study attempted to use a universal approach where all those in the population are included. Universal approaches are considered valuable as they promote wellbeing rather than only responding to pre-existing difficulties (which in this case would be an identified lack of attachment to the foetus) and they minimise stigma around interventions which in turn increases uptake of the interventions. They also allow high-risk participants to be identified and referred for further support (Stewart-Brown & Schrader MacMillan, 2010). However, as this was a small pilot study it was agreed that it would not be ethical to include those with serious depression, in case the intervention was unhelpful for expectant parents, and therefore placed them at greater risk. If the intervention was successful it could then be applied to more at-risk groups for further research into its effectiveness with this population. It was agreed by the researchers and the ethics committee that this was appropriate given that this was a new intervention and outcomes were not known. It was also agreed that participants must be able to speak English fluently due to a lack of resources from the research team for the study and the midwifery service. Finally it was decided that participants should all be expecting their first child and be at a similar stage of pregnancy to remove these factors

as possible confounding variables. Participants of any ethnicity, religion, sexual orientation or cultural background were eligible to participate in the study.

Inclusion criteria for the study were:

- 1) Participants must be registered patients with the NHS Trust Perinatal Service.
- 2) Participants must be registered to attend one of the service's antenatal classes.
- 3) The antenatal class they are attending must be running between December 2010 and March 2011.
- 4) Participants must be expecting their first child.
- 5) Participants must be between 24 – 29 weeks pregnant at the time of recruitment.
- 6) Participants must speak English fluently.

Exclusion criteria for the study were:

- 1) Participants must not be experiencing more than moderate depression. This was screened for using the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983). Those with severe difficulties were then to be excluded from the intervention and the data analysis.

2.2.3 Calculating Sample Size

A sensitivity analysis was indicated for this study as there was uncertainty regarding the effect size. The sensitivity analysis was conducted in relation to the group x time interaction which would use a mixed ANOVA. This interaction is considered as most important as it would lead to the conclusion that the experimental intervention was superior to standard practise. Cohen's effect sizes were used, where f values ranging from 0.10 to 0.25 indicate a small to medium effect size and 0.25 to 0.45 a medium to large effect size. As this was an initial study, predictions were modest. In particular the groups were recruited from a standard population rather than a clinical one, therefore any effect may have been less pronounced and harder to detect. Therefore a small to medium effect size was assumed (0.20 to 0.25). Analysis revealed that a sample size of between 50 – 80 was required to detect an effect size of 0.20 – 0.25 with a power of 0.95 and an alpha error of 5% (single-tailed).

2.2.4 Sample Size and Response Rate

2.2.4.1 Female Participants

123 expectant mothers were registered to attend an antenatal class between December 2010 and April 2011. Of these, 22 were excluded as they did not meet the study criteria and it was not possible to contact 18 others. Therefore 83 were invited to take part in the study. 4 potential participants declined to participate as they felt they had too many other commitments.

The remaining 78 expectant mothers consented to participate in the study of which 57 (73%) completed the first questionnaire. 34 participants (44%) completed the second questionnaire, and 39 (50%) completed the third. A flow chart showing these figures

split into control and experimental groups can be seen below.

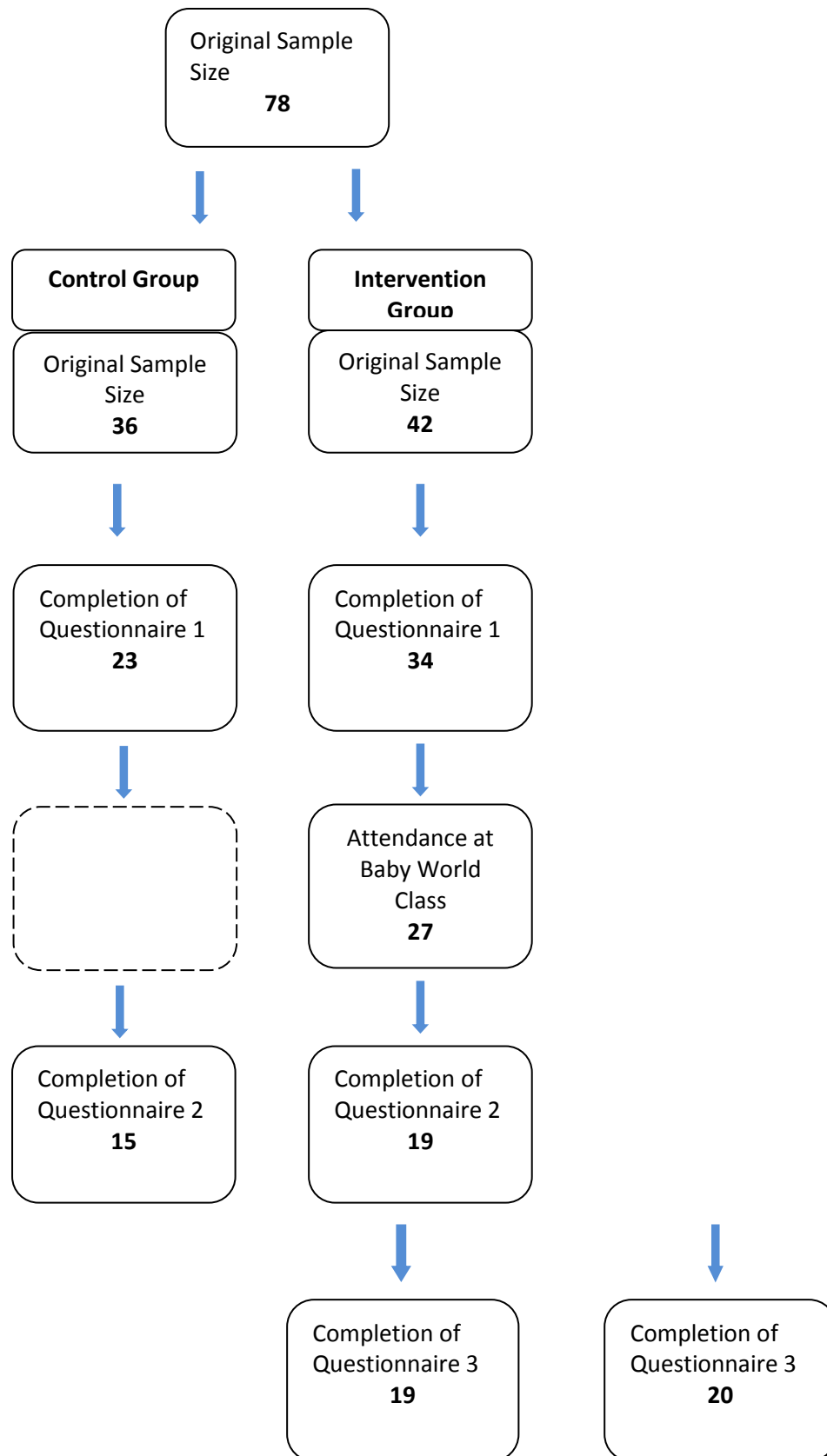


Figure 4: Flow chart of participation in the study at different time points for female participants

2.2.4.2 Male Participants

An equivalent chart for male participants is shown below. 26 partners consented to participate in the study of which the completion numbers were 21 (81%), 7 (27%) and 9 (35%) over the three time points. The higher attrition rate for the control group can be seen and is discussed further in the study.

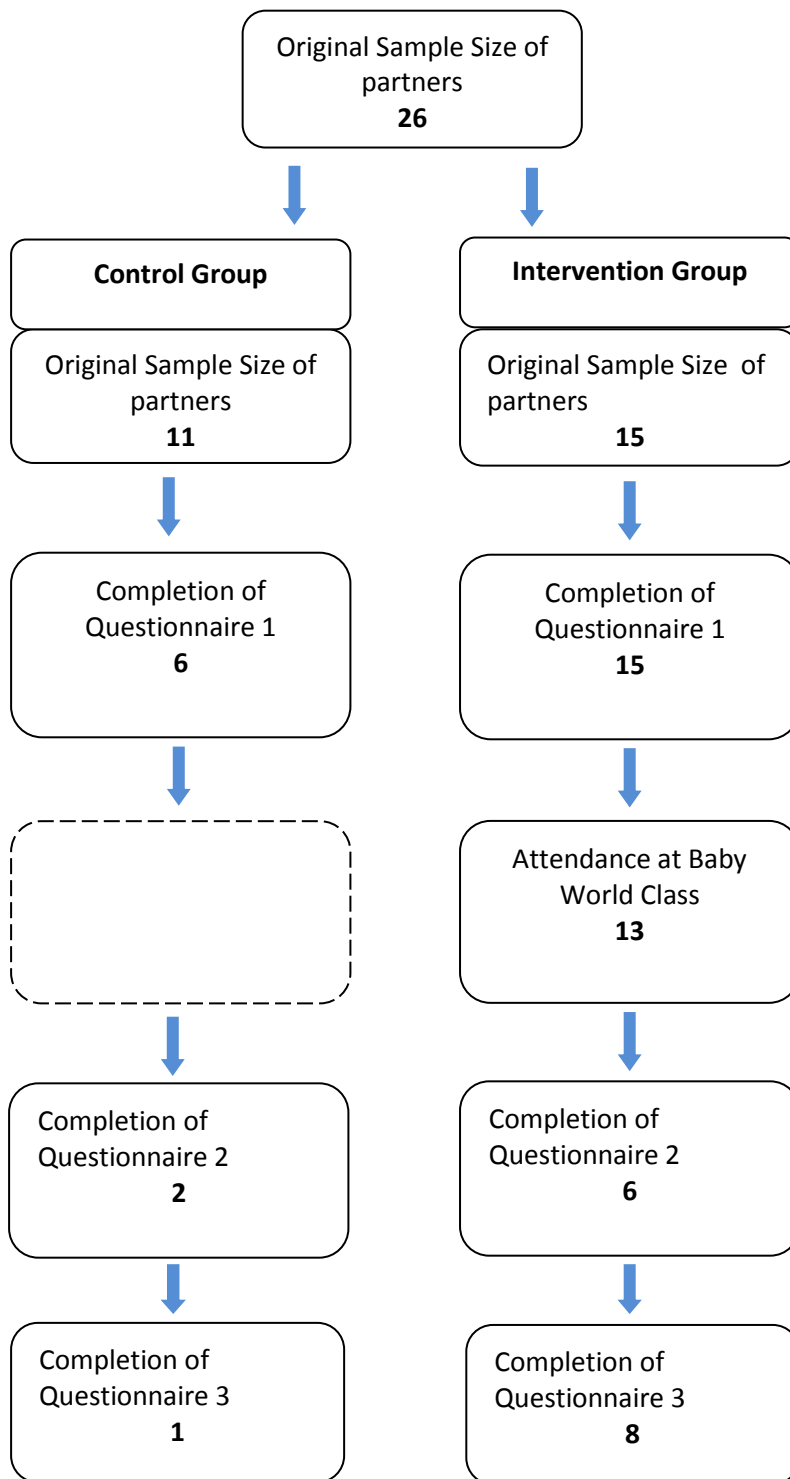


Figure 5: Flow chart of participation in the study at different time points for male participants

2.3 Intervention

2.3.1 Setting and Length

Owing to a lack of available research into similar interventions, it was difficult to calculate an optimum length or number of sessions for the study. After discussion, it was agreed that a one-off class would ensure maximum attendance of the complete intervention. It was also felt that participants would be more likely to attend if the intervention was a morning or afternoon session rather than a whole day and that this would be sufficient to convey the key messages of the intervention. Each class therefore ran for 3 hours with breaks, with participants arriving up to 30 minutes early and staying for up to 30 minutes for informal conversation afterwards.

The Baby World class ran on five occasions and was held in two different children's centres. It was held after standard working hours or on weekends to encourage male and female participants who worked full-time to attend. Participants were invited to attend the class that ran up to 4 weeks before their standard antenatal classes began. There were between 3 and 14 participants in each group. The classes were facilitated by the author and the study supervisor, who is also the lead clinical psychologist for the NHS Trust's Parent-Infant Psychology Service.

2.3.2 Design Process

The intervention was designed by the project supervisor Dr Tejinder Kondel, and the project author Laura Casale. Both researchers had previous experience of working with new or expectant caregivers and leading psychoeducational groups. In order to develop a new intervention, existing interventions were reviewed and discussed. Relevant literature was read, including literature referred to in this project (e.g. Parr, 1998; Barnes et al, 2008). Pertinent psychological models were considered, such as the model of attachment. This information was then combined with knowledge gained from previous experiences in working with expectant and new caregivers. Learning objectives were then chosen, and the intervention was designed based on these. The key learning objective was to develop the relationship between caregivers and their fetuses/infants. Slides and activities were designed and then checked. Finally, they were shown to a small group of expectant or new caregivers, to check that the slides

were clear and that the learning objectives could be achieved with the information given. Further details regarding the development of the intervention are given in the sections below.

2.3.3 Content

2.3.3.1 Considerations when Designing the Intervention

Facilitator Style

In their review of interventions, Stewart-Brown and Schrader MacMillan (2010) advise that successful parenting interventions must use a positive strength-based framework, with staff being non-judgemental, respectful and genuine. They also recommend the use of an ecological approach, where participants are thought about in relation to their environmental and situational context. Balbernie (2001) recommends that parents should be related to in a partnership rather than exerting power. Therefore classes were delivered in an informal and relaxed manner, and tried to acknowledge individual differences in a respectful and non-judgemental way. For example some participants were raising their infant in a single-parent home and others were living away from family and friends. These different contexts were shared and discussed. The facilitators attempted to empower participants, with the knowledge and ideas of participants being valued. The facilitators encouraged discussion throughout each class and presented opportunities for participants to share their ideas with others.

Involving the Male Participants

Nolan (2009) notes that classes must be tailored to the needs of all those in the class and particular consideration was given to gender-based needs within the class. Several studies have found that in antenatal contexts men feel like “strange visitors in the women's world” (p. 62) (Olsson, Sandman, & Jansson, 1996) and specifically within the classes feel as if they are merely observers (Smith, 1999). This is related to how information is presented in classes. One study (Barclay, Donovan, & Genovese, 1996) found that men felt alienated due to the way the information focused on expectant mothers, with very little information about their role or how their identity might shift (Fletcher, Silberberg, & Galloway, 2004). They found that as a result, “antenatal education was endured and not enjoyed by most men” (Barclay, Donovan, & Genovese,

1996) (p23). In the Baby World classes it was emphasised from the start that the information was for all caregivers and that gender-specific questions were welcomed.

Language and Use of Metaphors

The use of language in teaching has been extensively studied and will not be discussed in detail here. However, in brief, three characteristics of language that have been used to effectively inform others are clarity, concreteness, and association of new ideas with familiar ideas (Ehninger, Gronbeck & Monroe, 1980). Therefore it was agreed that the language used in the intervention should be easily understood and that difficult technical terms should not be adopted throughout. Participants were also given concrete examples of more abstract ideas. It is also suggested (Tedder, 2008) that to understand new concepts participants must be able to connect them with ideas that are already known (Atkinson, 2004), and that metaphors are particularly useful in helping participants to integrate and retain new information. Metaphors were therefore regularly used. For example, to introduce the idea of secure attachment and a secure base, the metaphor of using the safety bar around an ice rink to feel safe before exploring the rink was used.

Culturally Relevant Content

Several studies outside of England have emphasised the importance of culturally relevant interventions (Ho & Holyrod, 2002) and have found that women from non-western backgrounds are unhappy with the use of solely western materials in antenatal classes. In a review of information-giving during pregnancy, Nolan (2009) notes that there is an awareness in the UK that antenatal classes should have a multicultural approach. However, there still remains the tendency to use pictures and tools of White caregivers and infants, situated in western contexts. It is suggested that this is due partly to the lack of culturally sensitive teaching aids and the failure of professionals to be aware of their stereotypes.

The study aimed to recruit a culturally diverse group of participants. Insensitive practise could have alienated participants or left them feeling misunderstood or marginalised. Therefore in this study attempts were made to develop a culturally sensitive intervention. On a practical level it was attempted to use videos and pictures that represented different cultures and ethnicities. During the intervention the facilitators invited culturally-specific questions, which was responded to enthusiastically by participants. Facilitators

also did not describe ideas or theories as 'correct', instead they were described as currently popular and accepted but with the appreciation that ideas have changed and been challenged over time and between cultures.

The Use of Videos

Videos in this area have been used to great impact in the past, such as the well-known video '*A Two-Year-Old Goes to Hospital*' (Robertson, 1953). It was felt that videos should be used to communicate some of the ideas in the intervention and would have more of an impact on participants than merely discussing the ideas. Furthermore, much of attachment theory is grounded in caregiver-infant observations (e.g. Ainsworth, 1967). Therefore three videos were used in the intervention.

Size of Classes and Interactive Learning

Ho and Holroyd (2002) suggest that "small informal classes using role-play, problem-solving activities and experience-sharing sessions would promote interaction" (p. 83). Therefore the goal for these classes was to have between 8 and 20 participants per class and to include interactive teaching methods, with room for sharing personal thoughts and experiences. In exploring participant's views of childbirth education, Stamler (1998) observed that women attending antenatal classes would like to feel invited to ask questions and would like to have these questions responded to. Therefore, participants were regularly invited to ask questions, an opportunity which participants took and which often led to diverse and thought-provoking conversations.

2.3.3.2 Outline of the Intervention

The intervention is described in more detail in the box below and includes teaching objectives, content and teaching methods (in italics). Teaching objectives were related to the factors which are considered to impact on the caregiver-infant relationship and infant development, as described in section 1.4. These include attachment (Bowlby, 1951), caregiver sensitivity (Ainsworth, 1971), mind-mindedness (Meins, 1997), mentalization and reflective functioning (Sharp & Fonagy, 2008), attunement and affect-regulation (Stern, 1985).

Topics of teaching included:

- 1) Building the relationship, including ideas about responsiveness, closeness or proximity, consistency and reliability, visual contact and skin contact.
- 2) Ideas around creating a secure base and improving the quality of attachment.
- 3) Characteristics of the infant's world.
- 4) Emotional development, emotional regulation, how to encourage this and the implications of doing so, attunement to the infant.

Key themes which were referred to throughout were:

- 1) 'Good enough' is enough, you do not have to be perfect.
- 2) Listen to and observe your baby; they will often tell you what they need.
- 3) Sharing struggles and seeking support is a strength rather than a sign of weakness or being a 'bad parent'.

Intervention

Introduction

- 1) Participants were introduced to the facilitators and the class, and ground rules were established.
- 2) Participants were asked to introduce themselves and share something that they were looking forward to about having their baby.

Section 1

Learning Objectives:

For participants to gain an understanding of the concepts of attachment and caregiver sensitivity by applying it to their own experiences. For participants to then learn how these concepts relate to their new relationship with their infant.

- 1) An explanation of attachment; what it is, what elements are involved.

Powerpoint slide, the use of a metaphor to explain attachment and a paired exercise to think about the participant's attachments.

Learning Objectives:

To develop reflective functioning in participants, i.e. for participants to begin to think about what their infant might be experiencing and communicating. To do so using examples from their own experience and then applying to infant examples.

- 2) 'Through the Baby's Eyes' – what babies can see and understand, how the world might be experienced given this. Crying as communication.

A slide showing photos of what a baby might be able to see, a group discussion about how they would feel if this was them and then how a baby might feel.

Learning Objectives:

To introduce the concept of affect regulation visually and develop caregiver sensitivity. To help the participants become aware and prepared for how their infant crying might impact on them, and to plan how they could respond to their infant in a way that promotes affect regulation.

3) How we might react to a baby crying (normalising) and what to do

A slide of photos showing different people's reactions to a baby crying, explanation that different reactions are normal, discussion about how to helpfully respond to these reactions.

Break

Informal conversations

Section 2

Learning Objectives:

To introduce the idea of responsivity and attunement. To give examples of these concepts so that participants can understand how they might apply to their relationships with their new infants, and to encourage reflective functioning as they consider what the infant in the example might be experiencing.

1) Interacting and being responsive

Showed a video of a mother and baby interacting. The group identified how the baby communicated and how the mother responded. Watched the video again to consolidate these ideas.

Learning Objectives:

For participants to understand the concept of affect regulation in a more theoretical sense, and then observe and experience affect regulation from both the perspective of the caregiver and the infant.

2) Emotion regulation

Slide and explanation of emotion regulation. Showed video of caregivers interacting with infant to identify regulation. Pair exercise to experience different interactions and how it feels when another person reacts congruently.

Learning Objectives:

For participants to think in more depth about caregiver sensitivity in general, and specifically attunement, responsivity and affect regulation. For participants to learn about the impact when these factors are not present. 3) Neglect or inappropriate responses

Paired exercise to think about how it feels when people respond inappropriately or ignore us. Video showing the 'Still Face' experiment followed by discussion about what was seen.

Learning Objectives:

For participants to gain an understanding of how these constructs link to neurodevelopment.

4) A baby's brain and the short and long term impact of stress and secure attachment on the brain

Basic picture of the brain, didactic explanation of structure, explanation of hormonal response to stress and secure attachment using relevant examples. Pictures to emphasis the impact.

Learning Objectives:

For participants to make links between the concepts learnt, and observable behaviour in infants and children. In doing so, for participants to practise applying the concepts they have learnt, such as reflective functioning and attunement.

5) The short and long term impact of the attachment relationships.

Two slides listing a variety of impacts and the different contexts that these might apply to.

Break

Informal conversations and questions

Section 3

Learning Objectives:

For participants to begin preparing for a positive relationship with their infants by identifying possible barriers to a positive relationship, before they have occurred.

1) Barriers to attachment

Small groups, think of what might leave them stressed or struggling to attach to their infants.

Learning Objectives:

To empower participants to recognise and share their own expertise, resilience and creativity. For participants to prepare for a secure relationship with their infant by identifying how to respond to the suggested possible barriers in the future.

2) How to cope

Small group thoughts shared as a large group. Participants and facilitators responded with ideas and suggestions for managing these barriers, as well as noting that many people share the same stresses.

For participants to develop skills in caregiver sensitivity, attunement, affect regulation and mind-mindedness by practising them from both the caregiver and infant perspective in role plays.

3) Being with your baby

Introduced ideas around play, having fun and the use of music with infants. Pair work with toys, one person being the baby and the other the caregiver. Returned to large group to feedback the experience for the “infants” and the caregivers.

Conclusion

1) Summary

Slide of key ideas covered

2) Where from here

Outline of relevant services, handouts of the day’s activities and booklet of ideas called ‘playing with your baby’.

Focus Group

2.4 Measures

Choosing Measures

Demographic data was collected in order to identify any mediating variables. Due to the time limitations of this study the caregiver-infant relationship could not be directly measured through coding video observations postnatally. Therefore the study used the Maternal Antenatal Attachment Scale (MAAS; Condon, 1993) and Paternal Antenatal Attachment Scale (PAAS; Condon, 1993) as a measure of participant's attachment to their foetus. As discussed earlier, evidence suggests that a person's internal model of attachment based on their own experience of being parented strongly impacts on the way they relate to their future infant (Bowlby, 1973). Therefore a measure of participant's own parenting was included. The advantage of using self-report measures on a practical level is that they can be easily distributed and accessed by a large sample of participants. However, there are several disadvantages to self-report measures; firstly in using only self-report measures information is gathered from only one source. Secondly, social desirability factors can shape responses, thus biasing findings. However, as this was a RCT it was assumed that this bias would be spread equally between groups and therefore would not have an impact on the effect of the intervention. These issues are expanded on in the discussion section. A further disadvantage for this study was that any potential participants who were not literate would not be able to complete the questionnaire without assistance. As participating in the study required participants to read an e-mail and click on a link, those who were not literate would not have been able to complete it. However all participants who agreed to take part in the study also agreed to have the questionnaires e-mailed to them, indicating a sufficient level of literacy.

The measures used were:

- 1) Maternal Antenatal Attachment Scale (MAAS; Condon, 1993)
- 2) Paternal Antenatal Attachment Scale (PAAS; Condon, 1993)
- 3) Parental Bonding Instrument (PBI; Parker et al, 1979)
- 4) Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983)
- 5) Qualitative Questions (see below)

In addition a brief focus group was held at the end of the intervention groups discussing participant's experience of the group, the results of which are not included in this study, but will be reported in further studies.

Each of the four measures listed above will now be described; including how scores are obtained and their psychometric properties, such as reliability and validity.

2.4.1 The Maternal Antenatal Attachment Scale

The MAAS (Condon, 1993) was developed in response to the Maternal Fetal Attachment Scale (Cranley, 1981b), which Condon criticised as confusing feelings towards the pregnancy with feelings towards the foetus. It is based on Condon's Hierarchical Model of Prenatal Attachment (Condon, 1993). The measure is one of the most commonly used measures in the field (Laxton-Kane & Slade, 2002) which allows for direct comparison of results between a larger number of studies.

The MAAS has 19 items that ask questions about behaviours, attitudes and feelings towards the foetus. Each item is scored on a 5-point Likert scale and the items are then computed as a complete score and are also grouped into two subscales. The first subscale is quality of the attachment experience (11 items measuring constructs such as closeness or distance, tenderness or irritation) and the second is intensity of preoccupation with the foetus (8 items measuring factors such as the time spent thinking about the foetus). One item does not load strongly enough on either factor but it is included in the global attachment score. The minimum score for the Total MAAS is 19 and the maximum is 95. High scores on the subscales indicate a positive quality of attachment and high intensity of preoccupation. For information on development of the MAAS, please see Condon (1985).

Regarding internal consistency, Cronbach's alpha (Cronbach, 1951) of the global score are reported at between 0.69 (Schwerdtfeger & Goff, 2007) and 0.82 (Condon, 1993) which indicates acceptable to good reliability. Van Bussel, Spitz and Demyttenaere (2010) investigated the internal and external psychometric properties of the MAAS by comparing it with similar measures and checking correlations between subscales. They found that the total score and the subscales were reliable and valid, with similar Cronbach's alphas as in the original study (Condon, 1993). Condon, Corkindale and Boyce (2008) refer to a list of studies which they argue support the construct validity of the measure.

2.4.2 The Paternal Antenatal Attachment Scale

The PAAS was developed and piloted alongside the MAAS (Condon 1985) and the alpha coefficient was above 0.80, implying an acceptable level of internal consistency. The measure is scored in the same way and produces the same two subscales, however there are only 16 items on the PAAS. Both the PAAS and the MAAS have been described as being quick to complete, suitable as a screening tool and applicable to both expectant fathers and mothers.

2.4.3 The Parental Bonding Instrument

The PBI (Parker, Tupling and Brown, 1979) is a retrospective self-report measure designed to assess how a person's parents behaved towards them in childhood. There are 25 items on the measure for each parent. Adults complete the measure about how they remember their parents during their first 16 years, with one measure for their father and one for their mother. The results can be split into two subscales which measure perceived parental styles; 'care' and 'overprotection' or 'control'. The highest score for the care subscale is 36 and the highest score for the overprotection subscale is 39. The combined results of the two subscales can then be placed in a quadrant of parenting styles, with the cut-off values being slightly different for fathers and mothers. These variables reflect Bowlby and Ainsworth's descriptions of 'good enough' parenting as being a combination of responding to the infant's needs for protection and love whilst giving the child space to explore their environment (Parker, 1983).

Studies have shown that the PBI has satisfactory construct and convergent validity (Parker, 1989) and good reliability, with Cronbach's reliability coefficients in a recent study varying from 0.83 to 0.92 (van Bussel, Spitz, & Demyttenaere, 2009). The PBI has also been shown to have good internal consistency and test-retest reliability (Parker, 1989), over 10 and 20 years (Wilhelm et al. 2005; Wilhelm and Parker 1990). It is both independent of major demographic variables (Parker et al, 1979) and resistant to mood state (Parker, 1983). However, Parker et al (1979) did find that there was a statistically significant decrease in maternal care scores as social class decreased. This may relate to the mediating impact of socioeconomic status on well-being, which in turn may impact on the capacity that caregivers have to provide care for their children.

2.4.4 The Hospital Anxiety and Depression Scale

The HADS (Zigmond & Snaith, 1983) is a 14-item screening measure for the identification of depression and generalised anxiety. It was originally developed to be used in medical out-patient clinics; however it is now widely used in a variety of settings and in research (Herrmann, 1997). Several benefits of using the HADS have been identified. It is a brief questionnaire which tends to take between 2 and 5 minutes to complete, which makes it user-friendly. Scoring is straightforward and is generally used to identify both the presence and severity of anxiety and depression and to exclude or identify at risk participants in studies.

There are two subscales, one of anxiety and one of depression. Both give clinical cut-off points which indicate if the respondent is within the normal, mild, moderate or severe range. Although the HADS does not contain norm tables, a recent study provides percentiles for a non-clinical sample of 810 males and 978 females of age range 18-91 years (Crawford, Henry, Crombie, & Taylor, 2001).

In a review of studies which have used the HADS (Bjelland, Dahl, Haug and Neckelmann, 2002) the concurrent validity of the HADS was shown to be good to very good. It showed similar sensitivity and specificity to the widely used General Health Questionnaire (GHQ; Goldberg, 1978) and had medium to strong correlations with other commonly used measures such as the BDI and STAI (between 0.60 and 0.80). Other studies have reported similar findings (Hermann, 1997). Studies have found that Pearson's correlation coefficient for the two subscales of anxiety and depression are between 0.49 – 0.63, which would reflect clinical findings and theoretical understanding of the co-occurrence of the symptoms (Mykletun, Stordal & Dahl, 2001). Regarding the internal consistency of the measure, Cronbach's alpha has been found to be 0.78 – 0.93 for the anxiety subscale and 0.82 – 0.90 for the depression subscale. Similar figures were reported by Bjelland, Dahl, Haug and Neckelmann (2002), who reviewed 747 identified papers that used the HADS. This fulfils the criteria that self-report measures should be at least 0.80 when used as a screening instrument (Nunnally & Bernstein, 1994).

2.4.5 Qualitative Questions

Participants were asked the following two questions in their questionnaire:

- 1) If you attended the class called Baby World please write a little about its impact on you, your thoughts about your baby or any other feedback you feel may be useful.

- 2) Please write a little about the impact of your standard antenatal classes on you, your thoughts about your baby or any other feedback you feel may be useful, including what you were left feeling about your baby following the classes.

The questions were answered using a website where no personal data was requested. Participants were also informed that all responses given to these questions would be anonymous. This was done to increase the likelihood that responses would be more honest.

2.4.6 Missing Data

2.4.6.1 Missing Items

Missing items on a questionnaire was dealt with in several ways, following recommendations in questionnaire manuals and discussion. If participants missed out one item for a questionnaire's subscale the mean of the remaining items was used as a substitute item score. If more than one item per subscale in a questionnaire was missing, that subscale score was not included.

Three female participants did not complete the father part of the PBI. At the Baby World class I was told by two female participants that this was because they did not have contact with their father. Therefore if this scale was missing the participant was still included. If any participants had several missing values across the other questionnaires they would have been excluded from the analysis. However, this did not occur so all participants were included in the overall analysis.

2.4.6.2 Missing Questionnaires

The MAAS and the HADS were completed at three time points; at baseline (T1), following attendance at the Baby World class or at the equivalent time point for the control group (T2) and following attendance at the standard classes (T3). 13 participants

were missing complete datasets at T2 or T3 (see Table 7). Ignoring the missing dataset would have meant excluding approximately a third of the data. Two options were therefore considered. The first was listwise deletion - omitting those cases that had missing data and doing a complete case analysis. The disadvantage of this approach is the loss of statistical power; and results may be biased if a particular cohort dropped out (for example those with low educational attainment). Owing to the negative impact of this on power, it was decided to choose the second option of replacing missing values if one dataset was missing. Replacement data was calculated as follows: if data at T2 was missing, an average of the neighbouring values (T1 and T3) for that individual participant was used as a substitute. If T3 data was missing, intention to treat was assumed and therefore data at T2 was used as a substitute. If both T2 and T3 data was missing, the participant's results were excluded from analysis other than baseline analysis, as it was felt that a reasonable estimate of the effect of the study on these participants was not possible. Therefore the datasets of 10 participants were not included for analysis, and the datasets of 13 participants were given replacements. An initial analysis was conducted using only the results which had been produced directly by participants, i.e. without any replacements included. This was compared to results including missing data at T2 or T3, assuming an intention to treat. The two analyses led to similar outcomes. Therefore replacement data at T2 or T3 was included in the final analysis in order to provide more conservative and robust findings.

Table 2: Missing MAAS and HADS scores

Group	Time (T) at which data was missing		
	T2 only	T3 only	T2 and T3
Control	4	2	4
Experimental	4	3	6

1)

2.5 Procedure

As shown by the flow chart on the following page, expectant mothers were invited to participate in the study when they were between 25-29 weeks pregnant. Those who were randomly assigned to the experimental group then attended the Baby World class. Between 1 and 4 weeks following this and before attending the standard antenatal

classes all participants were asked to complete the second set of questionnaires. This second set was completed by both groups to check if any increased scores on the MAAS or PAAS were a result of attending the extra class or were more generally due to a natural increase in attachment to the foetus. All participants then attended the standard antenatal classes. They were then asked to complete the final set of questionnaires.

25-29 weeks pregnant
Potential female and male participants
contacted and inclusion criteria checked. If
criteria met, participants invited to take part in
the study.



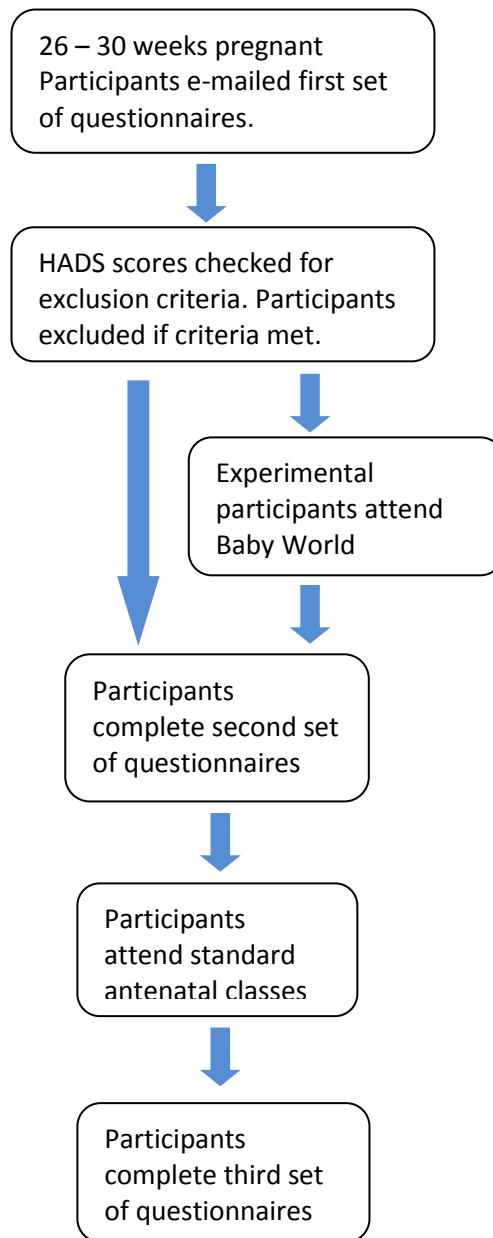


Figure 6: Flow chart of study procedure

2.6 Ethical Issues

Ethical approval for the study was granted by the Central London 4 Research Ethics Committee. Relevant documentation is provided in Appendix 4.

Informed consent

As discussed in section 2.2.1, participants were told about the study and any questions that they had were also answered. At this point it was clearly stated that participants were under no obligation to take part and that they could withdraw from the study at any time without any consequences in relation to their care. All interested participants were then sent the information sheet and consent form via e-mail.

Confidentiality

Participants were informed that any identifying data collected would be kept confidential unless there was risk of harm to themselves or others. The researcher did not have access to records and only names, due dates and telephone numbers were available from the midwife office. Potential participant's telephone numbers were accessed when contacting the potential participant to discuss their involvement in the research. If consent was given, their telephone number was kept securely for further contact. Each participant was given a code which was kept in a secure password-protected database. Any demographic or other data was kept in a separate anonymous password-protected database until completion of the research project.

Potential distress for Participants

Potential risks for participants were considered. As this was a pilot class it was possible that participants could feel more stressed from attending the intervention class or more worried about the impact of their parenting. In response, the intervention was designed to empower participants rather than leave them feeling helpless or hopeless. Furthermore the intervention included spaces for discussion regarding this issue and participants were informed of relevant organisations that provide support for expectant parents, particularly the Parent Infant Psychology Service.

2.7 Intended data analysis

The original plan was to present descriptive statistics for the MAAS and the PAAS, as well as the PBI. A mixed ANOVA would then be conducted for male and female participants to identify if there was an effect of the Baby World class on scores. Relationships between the PBI scales and the MAAS total scale were to be investigated

using Spearman correlations. Finally the data would be analysed to identify if any other factors were impacting on antenatal attachment scores, independent of group assignment.

However, two changes had to be made to intended data analysis. Firstly, very few male participants completed the questionnaires, with only one male in the control group completing the questionnaire at the third time point. Therefore there were insufficient numbers for statistical data analysis so no data of male participants was analysed. Secondly, as shown in section 2.2.3, analysis showed that a total sample size of between 50 - 80 was required to detect an effect size of 0.20 – 0.25. However, the numbers of female participants who completed questionnaires was smaller than this. Therefore it was decided that a 2 x 2 ANOVA comparing the effect of the group at the three time points was not the most appropriate analysis and that t-tests to compare MAAS scores at T2 and then at T3 would have more power to detect an effect of the group. A mixed ANOVA was then conducted to identify if there was an effect of group and time on MAAS scores.

3 Results

Analyses were carried out using the statistical package SPSS 18 for Windows.

3.1 Sample Characteristics

Demographic data of the pre-baseline sample of 78 females and 26 males is not known as it was collected when participants completed the first questionnaire. The sample characteristics for those female participants who completed questionnaires at baseline are presented in the table below.

3.1.1 Age at Baseline and Ethnicity

As shown in table 2 below, the majority of the participants were aged between 31 and 35 years (43.9%), and almost another third were aged between 26 and 30 years (29.8%). No participants were aged under 21 years. The majority of the sample were of white ethnicity (77.2%).

Table 3: Frequencies and percentages of the age of the sample

		Age (years)					Total
		21-25	26-30	31-35	36-40	41+	
Control	Frequency	1	6	11	4	1	23
	Percentage	4.3%	26.1%	47.8%	17.4%	4.3%	100.0%
Intervention	Frequency	2	11	14	6	1	34
	Percentage	5.8%	32.4%	41.2%	17.6%	2.9%	100.0%
Total	Frequency	3	17	25	10	2	57
	Percentage	5.3%	29.8%	43.9%	17.5%	3.5%	100.0%

Table 4: Frequencies and percentages of the ethnicity of the sample.

		Ethnicity		Total
		White	Non-White	
Control	Frequency	15	8	23
	Percentage	65.2%	34.8%	100.0%
Intervention	Frequency	29	5	34
	Percentage	85.3%	14.7%	100.0%
Total	Frequency	44	13	57
	Percentage	77.2%	22.8%	100.0%

3.1.2 Employment, Educational Attainment and Relationship Status at Baseline

Data regarding the current employment, educational attainment and relationship status of the sample are presented in Tables 3, 4 and 5 below. Almost three quarters of the sample (77.2%) were in full-time employment and approximately another tenth (8.8%) were unemployed or unable to work. Over three quarters of the sample (79.0%) either had a university degree or a post-graduate degree. All except one had finished school with at least five O-Level or GCSE qualifications. The majority of the sample (85.7%) described themselves as living with a partner or married whilst approximately a tenth (10.7%) described themselves as single.

Table 5: Frequencies and percentages of the employment status of the sample.

		Employment					Total
		Full-time homemaker	Full-time (>35 hours/ week)	Part-time/ contract work (<35 hours/ week)	Unemployed /unable to work	Student	
Control	Frequency	0	18	2	3	0	23
	Percentage	0%	78.3%	8.7%	13.0%	0%	100%
Interventio n	Frequency	2	26	2	2	2	34
	Percentage	5.9%	76.5%	5.9%	5.9%	5.9%	100%
Total	Frequency	2	44	4	5	2	57
	Percentage	3.5%	77.2%	7.0%	8.8%	3.5%	100%

Table 6: Frequencies and percentages of the education status of the sample

		Education					Total
		O-Levels/GCSE's	A-Levels	University Degree	Postgraduate Qualification	Other	
Control	Frequency	0	4	9	9	1	23
	Percentage	0%	17.4%	39.1%	39.1%	4.3%	100%
Interventio n	Frequency	3	4	18	9	0	34
	Percentage	8.8%	11.8%	52.9%	26.5%	.0%	100%
Total	Frequency	3	8	27	18	1	57
	Percentage	5.3%	14.0%	47.4%	31.6%	1.8%	100%

Table 7: Frequencies and percentages of the relationship status of the sample

		Age (years)				Total
		Single	Living with partner/ married	Separated/ divorced	Other	
Control	Frequency	3	20	0	0	23
	Percentage	13%	87.0%	0%	0%	100.0%
Intervention	Frequency	3	28	1	1	33
	Percentage	9.1%	84.8%	3.0%	3.0%	100.0%
Total	Frequency	6	48	1	1	56
	Percentage	10.7%	85.7%	1.8%	1.8%	100.0%

3.1.3 Equivalence at Baseline

The experimental and control groups were compared for demographic differences. If group differences for any of these variables were found they would have been included as covariates in analyses comparing the two groups on antenatal attachment. There were no significant differences between the groups on any of the demographic variables.

3.1.4 Mental Health Screening

3.1.4.1 HADS Scores at Baseline

Descriptive statistics for participants' raw scores on the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) are presented in Table 6 below. The mean scores for depression and anxiety for both groups fell in the "normal" or "mild" ranges. As the table shows, participants tended to report higher levels of anxiety than depression, which fits previous findings regarding expectant parents. Very little difference between the two groups was observed. T-tests confirmed that there were no significant difference between groups on the anxiety subscale, $t(55) = -0.57$, $p = 0.57$. This was repeated for the depression subscale, which also produced a non-significant result, $t(55) = -0.13$, $p = 0.90$. Using the HADS scoring criteria, 2 (3.5%) participants were identified as scoring in the severe anxiety range. No participants scored in the severe depression range (see appendix 9 for more information).

Table 8: Descriptive statistics at baseline for the two HADS subscales (Control N = 23, Intervention N = 34), showing means and standard deviations (S.D)

Subscale	Control		Intervention	
	Mean	S.D	Mean	S.D
Anxiety	6.91	3.40	7.47	3.75
Depression	3.96	2.89	4.06	2.94

3.2 Descriptive Statistics and Equivalence at Baseline

3.2.1 The Maternal Antenatal Attachment Scale

The descriptive statistics of the MAAS subscales and total scale score were computed for each time point separately and are shown in the table below (Table 8). The data at all three time points for subscales and total scores was slightly negatively skewed, except for the total ‘intensity’ subscale at T3 which was very slightly positively skewed (see appendix 10). Therefore the assumption of normality was not violated. Examination of kurtosis showed only a slightly peaked distribution at the three time points. As can be seen in the table below, the intervention and control groups show very similar scores at baseline for both subscales and for the total scale score, with low standard deviations. A t-test was conducted between the two groups at T1 for the total scale, to check if there was equivalence at baseline between the two groups. As predicted, there was no significant difference in the scores for the control group (M=78.09, SD=7.897) and intervention group (M=78.47, SD=6.579); $t(55) = -0.20$, $p = 0.$. It is of interest to note that over the course of time a slight increase in scores is noticeable (see figure 7).

Table 9: Descriptive statistics for the MAAS subscales and total score at T1, T2 and T3. Means and standard deviations (S.D) of the MAAS subscales.

Subscale	Time Point	Control (N=23)		Intervention (N = 27)	
		Mean	S.D	Mean	S.D
Quality	T1	45.	3.34	45.41	3.77
	T2	46.95	2.80	46.32	2.95
	T3	47.32	3.07	46.64	2.64

Intensity	T1	28.35	4.62	28.59	3.24
	T2	29.89	4.48	30.04	3.27
	T3	30.84	4.74	30.54	2.70

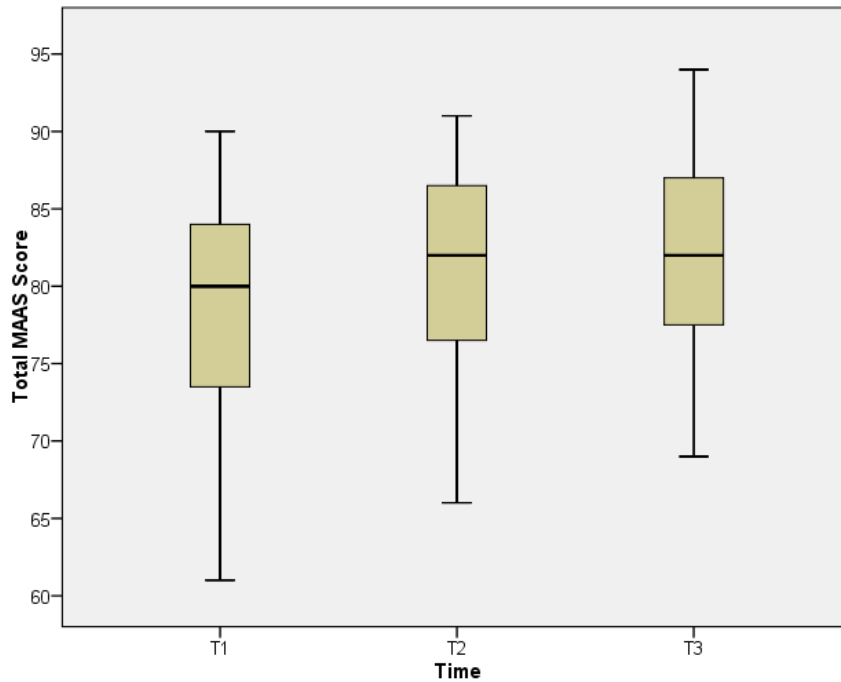


Figure 7: Boxplot showing mean scores over three time points for all participants.

3.2.2 The Parental Bonding Instrument

Data for female participants regarding the scores on the maternal and paternal PBI is presented in table 9 overleaf. The maternal measure regards how participants remembered their mother, and the paternal measure regards how participants remembered their father. The table and scatter plot below show that approximately half (48.2%) of the sample were classed as receiving optimal parenting for the maternal measure. The scatter plot also shows a ceiling effect of the maternal measure, as several participants gave the maximum score available for the care subscale. Correlations between the two subscales were significant $r(56) = -0.395, p < 0.01$.

Table 10: Frequencies and percentages for each maternal PBI quadrant for the sample.

		PBI Quadrant			
		Affectionate constraint - high care and high overprotection	Affectionless control - high overprotection and low care	Optimal parenting - high care and low overprotection	Neglectful parenting - low care and low overprotection
Control (N = 22)	Frequency	3	6	11	2
	Percentage	13.6%	27.3%	50.0%	9.1%
Intervention (N = 34)	Frequency	6	4	16	8
	Percentage	17.6%	11.8%	47.1%	23.5%
Total (N = 56)	Frequency	9	10	27	10
	Percentage	16.1%	17.9%	48.2%	17.9%

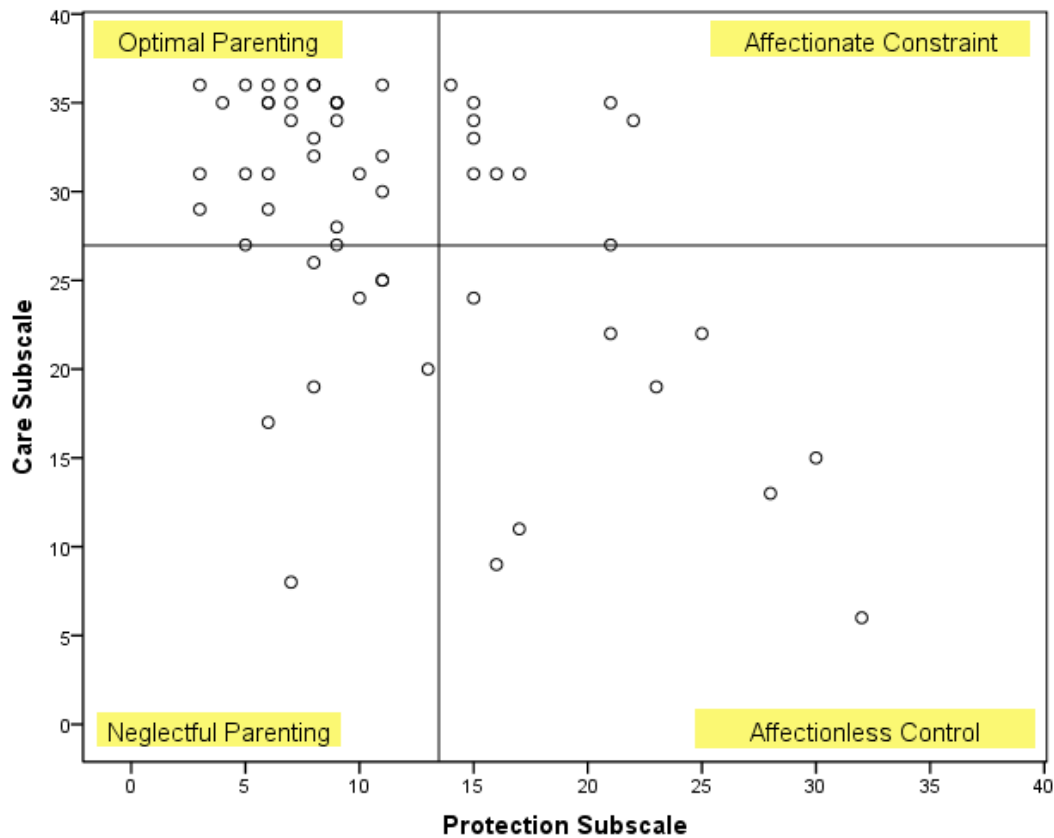


Figure 8: Scatterplot showing the distribution of scores for the maternal PBI overprotection and care subscales for the sample

Regarding female participant's recollection of their fathers, the table and scatter plot below show that slightly less fathers were classed in the optimal quadrant (43.4%).

Table 11: Frequencies and percentages for each paternal PBI quadrant for the sample.

		PBI Quadrant			
		Affectionate constraint - high care and high overprotection	Affectionless control - high overprotection and low care	Optimal parenting - high care and low overprotection	Neglectful parenting - low care and low overprotection
Control (N = 22)	Frequency	5	4	10	3
	Percentage	22.7%	18.2%	45.5%	13.6%
Intervention (N = 31)	Frequency	7	6	13	5
	Percentage	22.6%	19.4%	41.9%	16.1%
Total (N = 53)	Frequency	12	10	23	8
	Percentage	22.6%	18.9%	43.4%	15.1%

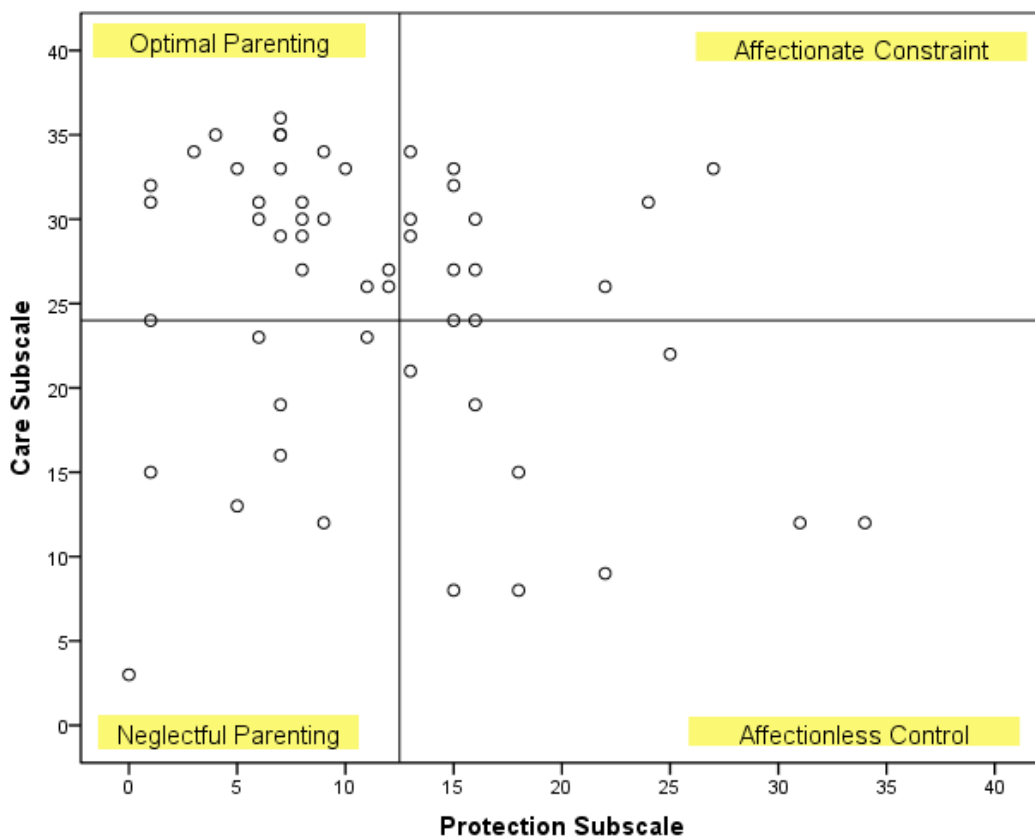


Figure 9: Scatterplot showing the distribution of scores for the paternal PBI protection and care subscales for the sample

3.3 Hypotheses Testing

3.3.1 Hypothesis One

The first hypothesis of the study was that attendance at the intervention class would lead to higher self-reported antenatal attachment scores than attending standard classes only.

In order to test for this, a t-test was conducted to identify if there was a difference between groups at the second time point (T2), which would suggest that there had been an immediate effect of the intervention class. There was no significant difference in the scores for the control group (M=81.37, SD= 7.28) and intervention group (M=80.89, SD=5.88); $t(45) = 0.25, p = 0.40$ (one-tailed) at T2.

Following this, a t-test was conducted to identify if there was a difference between groups at the third time point (T3), which would suggest that there had been a delayed effect of the intervention class, or that attending the Baby World class had led to a different experience of the standard classes. There was no significant difference in the scores for the control group (M=82.74, SD=7.61) and intervention group (M=81.79, SD=4.99); $t(45) = 0.52, p = 0.30$ (one-tailed) at T3.

The analysis therefore showed that attendance at the Baby World class did not have an effect on self-reported antenatal attachment. This includes there being both no immediate effect in the days following attendance at the class, and no later effect once participants had also attended their standard antenatal classes.

3.3.2 Analysis of Change Over Time

A two-way mixed ANOVA was conducted to compare total scores on the MAAS for participants in the two groups at the three different time points. The two groups were used as the between-subject factor and the three time points (T1, T2 and T3) as the repeated-measures factor. The dependent measure was the total score from the MAAS. As expected, no significant main effect of the intervention on the total MAAS score was found, $F(1,45) = 0.27, p = 0.605$ (one-tailed). There was also a non-significant Time x Group interaction $F(2,90) = 0.46, p = 0.632$. This showed, as the t-tests suggested, that there was no effect of attending the Baby World class at the difference time points.

There was however a significant main effect of time on the total MAAS score, $F(2,90)=26.98$, $p < 0.001$ (one-tailed). Post hoc tests showed that the MAAS total score was significantly higher at T2 than T1 ($p < 0.001$). The mean for T1 was 78.32 and the mean for T2 was 81.09, therefore the mean difference was 2.77. The score was also significantly higher at T3 than T2 ($p = 0.048$), though this was approaching non-significance. The mean scores at T2 was 81.09 and at T3 was 82.17, giving a mean difference of 1.08, which is a more modest increase.

The graph below demonstrates this pictorially, showing that participant's scores on the MAAS increased over time at a similar rate in both groups, and particularly between the T1 and T2.

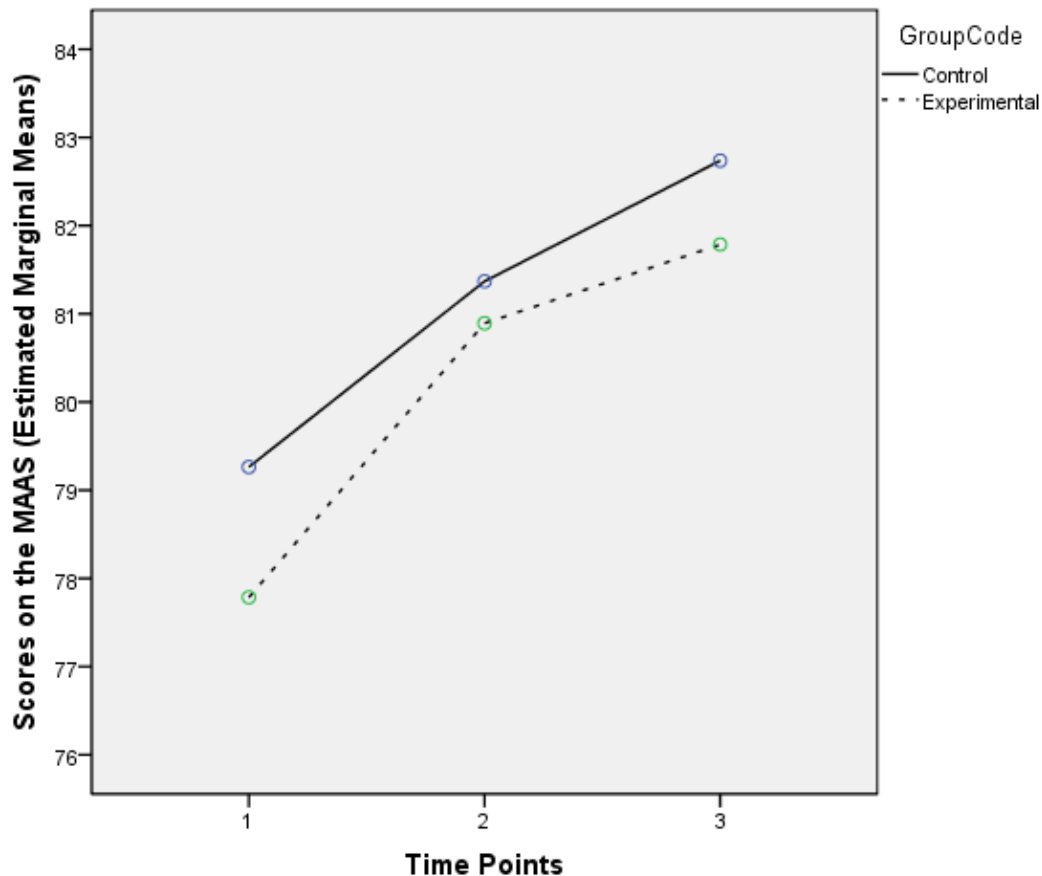


Figure 10: Graph of changes in total MAAS score over time.

Repeated measures ANOVA's for the two subscales of the MAAS were conducted to identify if one was more affected by time than the other. There was a significant main

effect of time on the MAAS quality subscale score, $F(2,92) = 10.96$, $p < 0.001$. Post hoc tests showed that the MAAS quality subscale score was significantly higher at T2 than T1 ($p = 0.01$), and that the score was also significantly higher at T3 than T1 ($p > 0.001$). However, no significant difference was found between T2 and T3 ($p = 0.584$).

There was a significant main effect of time on the MAAS intensity subscale score, $F(2,92) = 28.05$, $p < 0.001$ (one-tailed). As with the other subscale, post hoc tests showed that the MAAS intensity subscale score was significantly higher at T2 than T1 ($p > 0.001$), and that the score was also significantly higher at T3 than T1 ($p > 0.001$). However, no significant difference was found between T2 and T3 ($p = 0.090$).

3.3.3 Analysis of Covariance

An analysis of covariance (ANCOVA) was conducted to investigate if any possible confounding variables were masking an effect of the Baby World class on the maternal antenatal attachment scores. No variables had been found to be significantly different between groups (see 3.1.1.3), however those that were approaching significance were included in the ANCOVA. No variables were found to be significantly affecting scores at either time 2 (1, 0.401) or time 3 (1, 0.688), except for the time 1 antenatal attachment scores (see appendix 11). This means that the antenatal attachment score that participants had at the first time point was closely related to their scores at later time points. This indicates that antenatal attachment is a fairly stable construct, which shows consistency between different time points.

3.3.4 Hypothesis Two

The second hypothesis of the study was that participants with higher scores on the PBI would have higher scores on self-reported antenatal attachment.

Spearman's correlations were conducted with all PBI subscales and the total MAAS scores at baseline (T1). A modest but significant correlation of 0.3 was found between the maternal PBI care scale and the total MAAS score at T1 ($p = 0.012$) (see figure 11 below). A very small and non-significant correlation of 0.02 was found between the maternal PBI overprotection subscale and the total MAAS score. The paternal PBI care scale also showed a very small correlation, of 0.05 whilst the paternal PBI overprotection

scale was similarly small at 0.19. Neither of these were significant. The results of these analyses shows that participants who scored their mothers as high on the care subscale were also more likely to report higher levels of antenatal attachment with their foetus. However, feeling overprotected by their mothers, and their memory of their father's parenting, did not correlate with their self-reported antenatal attachment with their foetus.

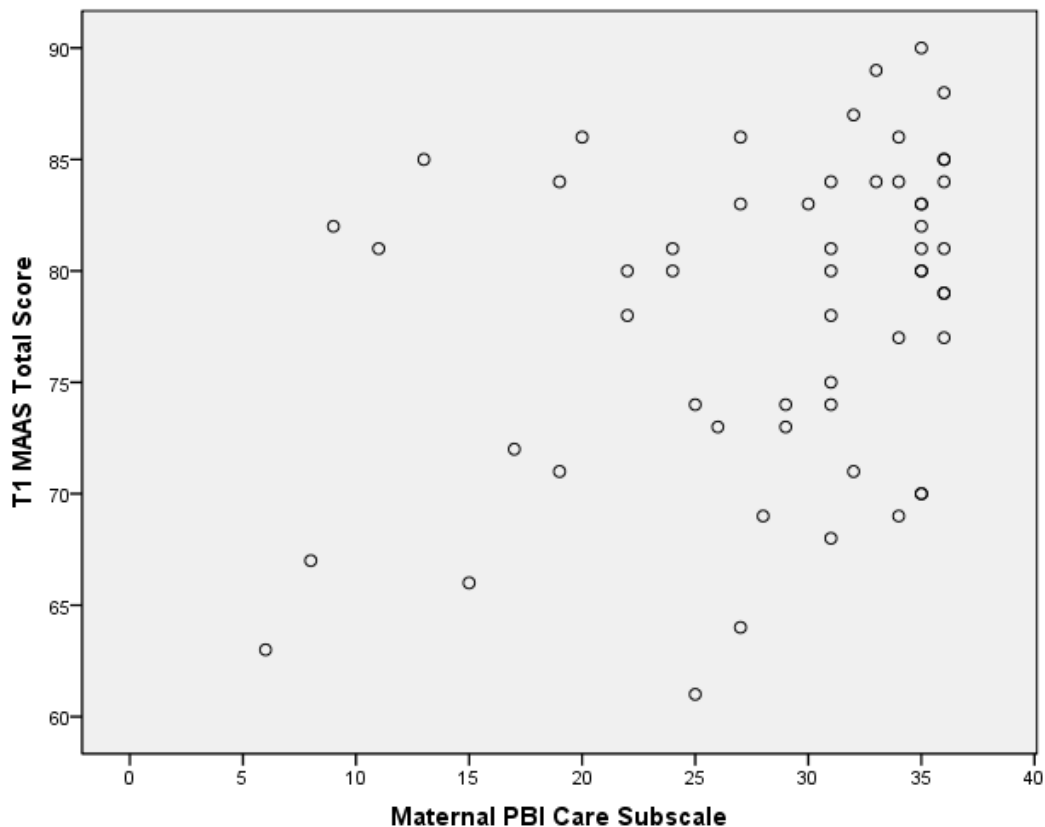


Figure 11: Scatterplot of correlations between the MAAS at T1 and the maternal PBI care subscale

3.4 Other determinants of Antenatal Attachment

Analysis was conducted to identify if any other variables recorded in the study were related to self-reported antenatal attachment. There were no significant relationships between any of the demographic information and the total MAAS score. This shows that factors such as previous history of miscarriages, whether the pregnancy was planned, age and education level did not impact on self-reported antenatal attachment in this study.

As a result of previous findings, some of which were discussed in section 2.5.4, it was thought that participants with higher depression scores on the HADS would show lower scores on self reported antenatal attachment. A small but significant negative correlation was found between depression scores on the HADS and the total MAAS score at T1, $r(55) = -0.28$, $p = 0.02$. There was also a small negative correlation between anxiety scores on the HADS and the total MAAS score, however this was not significant $r(55) = -0.16$, $p = 0.12$. This shows that participants in this study who showed higher self-reported levels of depression were also more likely to show lower self-reported antenatal attachment with their foetus.

3.5 The Impact of the Study on Mental Health Scores

The table below shows the mean HAD scores for each group at the three time points. Between-subjects ANOVA's were conducted to identify if anxiety or depression scores were affected by attending the Baby World class. There was no effect of the intervention on either anxiety or depression. Repeated measures ANOVA's were also conducted to identify if there were any changes in these scores over time. No significant changes in depression occurred over time. However, anxiety scores did decrease over time $F(2,86) = 8.268$, $p = <0.001$ (one-tailed), suggesting that participants in both groups became less anxious over their pregnancy.

Table 12: Descriptive statistics for the two HADS subscales (N = 57), showing means and standard deviations (S.D) at the three time points.

Subscale	Time Point	Control (N=30)		Intervention (N = 27)	
		Mean	S.D	Mean	S.D
Anxiety	T1	7.00	3.53	7.24	3.87
	T2	6.21	2.76	6.24	3.32
	T3	5.68	2.41	5.80	3.69
Depression	T1	3.95	3.14	4.04	2.72
	T2	4.00	1.94	4.80	2.58
	T3	3.74	3.33	4.56	2.55

3.6 Content Analysis

A small qualitative content analysis (Hsieh & Shannon, 2005) was undertaken to explore how participants experienced the Baby World class. Qualitative content analysis has been described as a “sense –making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings” (Patton, 2002, p453 in Zhang & Wildemuth, 2009). It enabled the researcher to “understand social reality in a subjective but scientific manner” (Zhang & Wildemuth, 2009, p1).

As stated in section 2.4.6, participants were asked the following two questions:

- 1) If you attended the class called Baby World please write a little about its impact on you, your thoughts about your baby or any other feedback you feel may be useful.

- 2) Please write a little about the impact of your standard antenatal classes on you, your thoughts about your baby or any other feedback you feel may be useful, including what you were left feeling about your baby following the classes.

For this analysis, comments regarding the Baby World class were collated, read and then re-read. Thirty-six female and 8 male participants wrote comments about their experiences of the Baby World class. As they were very similar in content, comments from both genders were combined for analysis. Open coding was completed for the first 8 participants by highlighting expressions of key ideas and then using these to form codes, which were then organised into categories. This initial coding scheme was then used with the rest of the comments, and several changes were made to include information that was unique at this stage (see Hsieh & Shannon, 2005 and Zhang & Wildemuth, 2009 for a full explanation of the process used). Of note, many of the participants made reference to particular aspects of the class that they had found interesting, such as watching videos or seeing pictures of the brain. These comments were not included in this results section as the focus was on their experience of the class and as such they are outside the scope of this study. However they will be of use in the future if considering how to improve the class.

Comments regarding the standard antenatal classes were scanned for any comments that related to the psychological impact of the class, as this is the main area of interest for this study. Analysis of these comments is included in the section regarding the

psychological impact of the class. Other comments will be used to provide feedback to the midwife team on their classes.

Presentation of Results

Four overarching categories were developed each with between two to four codes. The categories were: experience of the class, emotional impact of the class, psychological impact of the class and recommendations. The four categories and their related codes are displayed separately in the tables below. Illustrative quotes are included in the tables, followed by more detail regarding the category findings.

Category 1: Experience of the Class

Code	Subcategory	Quotes
Experience of the Class	Overall Experience	<p>I found the class helpful and informative</p> <p>I really enjoyed this class</p> <p>Great Class!</p> <p>Very interesting and informative</p>
	Group Experience	<p>Larger class would have been better as would have facilitated more conversation and discourse</p> <p>Good to... meet local mums</p> <p>...others people thoughts, worries, made me realise that I'm not the only one who have got concerns</p>

Of the 44 participants who wrote comments, 24 commented on their experience of the class overall. All of these comments were positive. In particular, participants spoke about the class being useful, interesting or informative, implying that they had learnt at the class. Many also wrote that the class had been enjoyable, implying that the experience had been an emotionally positive one. More general comments described the class as “great” or “good”. Of those who did not write comments about the class overall, almost all instead wrote positively about specific aspects or topics within the class.

A small number of participants wrote about their experience in relation to being part of a group. For those who had attended one of the two smaller groups (where there were less than 5 participants in a group), the comments suggested that they would have preferred larger classes, whilst those who attended larger groups spoke about enjoying meeting other expectant parents locally. For one participant, the experience of hearing other's thoughts was particularly helpful as this showed her that her worries were not unique, which in turn left her feeling less alone.

Category 2: Emotional Impact of the Class

Code	Subcategory	Quotes
Emotional Impact of the Class	Impact on the Day	I found it reassuring Before the class I was worried that I won't be perfect but the phrase 'good enough is enough' stuck with me
	Longer-term Impact	I...hope it will help me cope with this new and probably overwhelming experience. It made me look forward to the baby even more Everything seems a little less daunting now Actually makes me look forward to things even more as I feel armed with a few more ideas on how will cope

Several participants wrote of the positive emotional impact of attending the class. In particular participants spoke of feeling “reassured” in relation to their ability to look after a baby.

Others spoke about the longer-term impact of the class on their emotions, explaining that they felt more able to manage and were now more excited about having a baby and becoming parents. Several related this to having confidence in themselves and the communications of their baby; for example one participant wrote that they had learnt that there are “no black and white answers to questions” and that “it's about using common sense”, whilst another wrote “I shouldn't be afraid to trust my instincts”.

Category 3: Psychological Impact of the Class

Code	Subcategory	Quotes
Psychological Impact of the Baby World Class	Reflective Functioning and Mind-mindedness	<p>It made me think about the baby post pregnancy and how she will be thinking and feeling; made her feel more human.</p> <p>It was useful to see things from the baby's perspective</p> <p>Before I was thinking more about basic needs of the baby like hunger; changing nappies; now I know that the baby is trying socialise from the beginning</p> <p>Very beneficial to think of things from the baby's point of view</p>
	Interacting with the Baby	<p>Very positive impact - particularly how much I can offer the baby in terms of stimulation just using facial expressions; skin to skin contact and voice.</p> <p>Helped me to... think about how I will interact with it and care for it once it is born</p> <p>It has really changed my thoughts on baby's crying and how to interact with them.</p>
	Sensitivity and Attunement	<p>I liked the way you show us how to play with the baby; and how to read signals when baby is not interested.</p> <p>I also found the video's showing the baby 'telling' the parents stuff i.e. they'd had enough extremely worthwhile. Prior to this course; I probably have been unaware of these signals...Now I know to look for them</p> <p>Crying is just their way of expressing themselves</p>

	Responsibility and Impact of Being a Caregiver	<p>I now know that I am responsible for shaping how the child grows up - i.e. what happens in the first 2 years has a direct impact on how they behave (in part at least) when they grow up.</p> <p>Realise how much of an impact I will have on the development of the child</p>
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Psychological Impact of the Standard Antenatal Classes		<p>There was very little about the baby in the class except the advantages of breastfeeding.</p> <p>It didn't really make me think any differently about the baby.</p> <p>My attitude towards baby hasn't changed any course but I felt more informed</p> <p>I thought more about the baby in the "baby world" class. The other classes are more meant to explain to the mums how they are supposed to function.</p>
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The most frequent comment made by participants regarding the Baby World class was that they had learnt about the world from the baby's perspective, with other comments describing their baby as having intention and their behaviours being meaningful and worth reflecting on. The comments fit very closely with the concepts of sensitivity, mind-mindedness and reflective functioning as discussed in the introductory section. In general, participants wrote that before the classes they had been thinking about the baby from their own perspective, and that the class had led to a shift towards thinking about their baby's understanding of the world. Others wrote about now seeing their baby as a person rather than an object, which implied a shift towards a more mind-minded stance.

This shift towards thinking about the world from a baby's perspective then impacted on their views on interacting with their baby, with participants noting that following the class they now intended to increase their interactions with their baby and also think more about *how* to interact. Participants wrote about how the class shifted their understanding of the behaviour of infants from being random, to a communication that

should be thought about and responded to. For example several participants wrote about understanding crying as a communication, which appeared to be a new idea for them. These comments implied that caregivers were becoming more sensitive and attuned to their future infants, as described in the introduction.

The fourth category in this section is entitled 'responsibility and impact of being a caregiver'. Several participants wrote about caregivers having a significant impact on their infant's development. The comments implied either directly or indirectly that participants were realising that their behaviour and interactions would have an impact on their infant's development, and that this was a responsibility that they held as parents.

The final category includes comments regarding the psychological impact of the standard classes. Although participants were invited to write about the impact of these classes on their thoughts about their future infant, very few participants mentioned any thoughts about them. As the examples above show, those that did speak about this described feeling no different or there being very little about the baby. No participants spoke about having changed their thoughts or attitudes towards their baby.

Category 4: Recommendations

Code	Subcategory	Quotes
Recommendations	Changes to the class	<p>I would like to know more about brain development of the baby</p> <p>Larger class would have been better as would have facilitated more conversation</p> <p>I didn't learn that many new things however I think it would be very useful for teenage mothers or for people who don't have the support and educational background that I am lucky enough to have</p>
	The future of the class	<p>It was the only class which covered things about the baby after it's born - I think it should be available to everyone</p> <p>Great Class! Should be as important as usual antenatal class and appear as must do program!</p> <p>I feel this information should be available to all prospective parents</p>

Very few comments were made regarding how the class could be improved, however this was not a question that was asked directly, which may have discouraged participants from writing any direct feedback. Of those that did offer comments, one participant wrote that they would have liked more information on brain development and a few participants in the smaller classes commented that larger classes would have led to more discussions and improved peer-learning. The comment of one father is included in the table above, his suggestion was that the class would be more useful for those with a lack of support and education. Others spoke about wanting a second part to the class following the birth of their baby, or a few weeks after the original class, to consolidate their learning - one participant wrote "I hope I remember this in a few weeks!".

Several participants gave suggestions regarding the future of the class. Some suggested that the class was as important as standard classes and that it should be a regular part of standard care or at least offered to all prospective parents.

3.7 Attrition Characteristics

T-tests were conducted to analyse if there was a difference in demographic characteristics, MAAS or PBI scores between those female participants who dropped out of the study after T1 and those who stayed in the study. No significant difference was found for any of the demographic variables. Furthermore, no significant difference was found for the MAAS ($t = 0.154$, $p = 0.878$) or any of the PBI scores.

4 Discussion

In the results section above, the findings of the study were presented and described. In this chapter these results will be placed in context and discussed in relation to existing findings and theory. Following this, the clinical implications of the study will be discussed, and the strengths and limitations of the study presented. Finally, suggestions for further research will be made.

4.1 Summary of Main Findings in Relation to the Hypotheses

4.1.1 Hypothesis One

The first hypothesis of the study was that attendance at the intervention class would lead to higher self-reported antenatal attachment than attending standard classes only. This hypothesis was tested using the MAAS and the PAAS, though due to a very limited sample size, no statistical analyses were conducted on the PAAS scores. The analyses that were conducted on the MAAS scores showed that attendance at the intervention class did not lead to a difference in self-reported antenatal attachment scores, either immediately following the intervention class or following later attendance at standard antenatal classes. There are a number of possible explanations for this lack of a significant effect.

The first explanation for this is that the class did not have an impact on antenatal attachment. The implications for this are that the class does not meet its aims. This could be due to the class being too short or being taught at an inappropriate time when expectant parents are more focused on practical considerations. This is supported by some researchers who suggest that expectant mothers are preoccupied with the birth in the latter stages of pregnancy and therefore a brief intervention will not have a significant impact if conducted at this time. A study by Bellieni et al (2007) found a significant impact of their intervention on antenatal attachment scores, however this intervention took place in the first and second trimesters. This provides further support for the idea that a third trimester intervention is less likely to have an effect, which implies that the timing of the class should be changed. However, it was agreed with the midwife service that recruitment could only occur once the pregnancy was considered 'viable', which is at 24 weeks. The second trimester ends at 27 weeks, therefore the change in timing would not have been possible for this study. Another explanatory factor relating to the class could be that significant parts of the class were not relevant

and the content should be changed. However, the anonymous comments made by participants suggest that the content had an impact on their thoughts and feelings towards their foetus.

Another explanation for a lack of statistical significance regards the sample that was used for the study. As discussed in section 2.4.1, the minimum score for the Total MAAS is 19 and the maximum is 95. All participants in the sample scored between 61 and 90 at baseline, with a mean of 78.32, and a median of 80. This implies that many of the participants had a high level of antenatal attachment at the start of the study, according to the MAAS. Barnes and Freude-Lagevardi (2003) note that interventions will show a larger impact and have more benefits if they focus on more at-risk communities, such as those with high rates of poverty, single parenthood and adolescent parents. Perhaps with a more at-risk sample, the intervention would have had more of an impact on antenatal attachment, as measured by the MAAS.

A third explanation for the lack of significant findings is that the timing of measurements was inappropriate. In their meta-analysis of similar interventions, MacLeod and Nelson (2000) found that antenatal interventions showed larger effect sizes at follow-up than soon after the intervention. This suggests that it may take time for the intervention to have its full impact, and a fourth time point at a later time could have shown a significant effect of the intervention.

A final explanation regards the instrument that was used and the construct that was being measured. Although the MAAS has been used successfully to show changes in antenatal attachment in other research, it is possible that it was not appropriate for this study. As discussed in the introduction, Condon and Corkindale (1997) defined antenatal attachment as, “the emotional tie or bond which normally develops between the pregnant parent and her unborn infant” (p.359). The MAAS is designed to capture how this bond changes, regarding the amount of time and quality of preoccupation of the expectant parent. However, it does not focus on measuring changes in *how* the parent thinks about their foetus. Using a measure such as the Working Model of the Child Interview (WMCI; Zeanah et al, 1994) might have led to different findings.

This suggests that the MAAS captured overall change over time, but did not capture change in *how* the participants thought about their foetus, and therefore did not

differentiate between the two experimental groups. This idea is particularly supported by the qualitative findings. Although the scores on the MAAS did not reflect a significant change in antenatal attachment, the comments that were made suggested that the intervention had an impact on constructs that are considered to be part of, or closely related to, antenatal attachment. This includes constructs such as reflective functioning and responsiveness or sensitivity. These constructs will now be briefly re-introduced and findings relating to them will be discussed in more detail.

As discussed in the introduction, caregiver sensitivity can be understood as how consistently the caregiver is able to attend to and respond to their infant (Brandon et al., 2009). Mind-mindedness is defined as how much a caregiver can see their foetus or infant as an individual being with more than only physical needs (Meins, 1997). This impacts on a caregiver's understanding of *why* their foetus or infant is behaving in a particular way, and therefore the appropriateness of the caregiver's response. In the introduction the terms mentalization and reflective functioning were also discussed. The former refers to the ability to have insight into another's thoughts, feelings or intentions and the latter refers to the operational definition of mentalization (Fonagy & Target, 1997). Finally, in the introduction affect-regulation was linked to attunement; the degree to which a caregiver can respond to the perceived internal state of their infant (Fonagy, Gyorgy, Jurist, & Target, 2005).

Very little has been written about the use of these constructs in an antenatal context in order to measure the antenatal or future postnatal relationship. Indeed, only a few studies were found which researched the link between the caregiver-foetus and caregiver-infant relationship using something other than a direct measure of antenatal attachment. Of interest for this study, Benoit, Parker, & Zeanah (1997) used the Working Model of the Child Interview antenatally (WMCI; Zeanah et al, 1994) to measure mothers' representations of caregiving. They found a significant relationship between participant's antenatal representations of their infants and classifications of attachment.

Although the WMCI was not used in this study, the qualitative findings suggest that the intervention had an effect on the parents' representations of caregiving. For example, participants wrote about realising the extent of their impact on their infant, which implied that they were becoming more aware of and sensitive to the importance of their relationship with their infant. Furthermore, several comments made by participants

suggested that the Baby World class had impacted on their understanding of their infant and how they would respond to them. As discussed in the results section, some participants directly wrote that they saw their foetus as more of a person and in turn were thinking about infant behaviour as meaningful. These qualitative comments suggest that the intervention led at least some of the participants to think about their future infants in a more mind-minded manner. Furthermore, many participants wrote about viewing the world through their baby's eyes rather than their own, implying that the intervention increased participant's engagement in reflective functioning. These comments were qualitatively very different to the comments made regarding standard classes, where very few participants made reference to thoughts about their baby. This suggests that the Baby World class and the standard classes had a different effect on the participants.

In conclusion, the qualitative findings suggest that the study may have affected some specific factors related to the caregiver-foetus relationship, which was not reflected in the findings of the quantitative measure of antenatal attachment.

4.1.2 Hypothesis Two

The second hypothesis of the study was that participants with high care and low protection scores on the PBI would have higher scores of self-reported antenatal attachment. As presented in the results section, the only significant correlation that was found was between the maternal PBI care scale and the total MAAS score. This was a modest correlation. This suggests that for participants in this study, the self-reported experience of feeling cared for by their mother is somewhat related to how they feel about their future child. This adds to the existing body of research regarding the link between a caregiver's own experiences of attachment and their antenatal attachment to the foetus, which has produced mixed findings (Huth-Bocks, Levendosky, Bogat, & von Eye, 2004; van Bussel, Spitz & Demyttenaere, 2010; Priel and Besser, 2000).

There are several possible reasons for why only the maternal care subscale was shown to correlate with the MAAS. Firstly, it is possible that recall and social desirability biases (see section 5.4.3) significantly affected scores for this subscale more than others, with participants responding to societal expectations that mothers should show high levels of care. Another explanation is that the PBI does not measure those aspects of early

attachment experiences which affect the development of antenatal attachment (Mhyr et al, 2004). A further explanation is that these early attachment experiences do not have as large an effect on the caregiver-foetus or caregiver-infant relationship as is thought. In line with this, although in the introduction it was argued that there was a strong intergenerational impact of caregiving, some studies had found support for an alternative view. For example a meta-analytic study by van IJzendoorn (1995) found that caregiver's own history of attachment explained only 12% of their sensitive responsiveness. This suggests either that other mechanisms affect the intergenerational transmission of attachment, or that other factors are affecting the development of attachment more significantly than is realised. Other variables that have been found to impact on antenatal attachment include poverty (Shonkoff & Phillips, 2000), the caregiving presence of other family members or teachers in childhood, and life-changing events. It is possible that these factors have a more significant effect on antenatal attachment, or that they mediate the relationship between the two factors measured in this study. There are many other factors which may have an effect, but have not been considered in this study, such as the impact of other internal psychological processes. This is a recognised limitation of this study.

4.2 Additional Findings

4.2.1 Changes in Antenatal Attachment over Time

Results showed that over the course of the study, mean scores for the MAAS increased from 78.32 to 82.17. This occurred in both the control and intervention groups, which suggests that this result is unrelated to the intervention. The increase in antenatal attachment over time fits the theory proposed by Winnicott (1958) that women become increasingly emotionally dedicated to the foetus as it develops. The findings also add support to pre-existing research findings which have found similar results (Armstrong, 2002; Caccia et al., 1991). It does not support the theory posited by Stern (1995) that over the last 2 months of pregnancy attachment does not increase, as positive internal representations of the foetus are withdrawn to prevent a future contradiction between the representations of the baby and the real baby.

4.2.2 Sociodemographic Determinants

The results showed no significant relationship between any of the demographic information and the total MAAS score. Other studies have found that age has been related to antenatal attachment scores (Damato 2004; Siddiqui et al. 1999), with older women reporting lower scores. Van Bussel, Spitz & Demyttenaere (2010) also found that women with higher education levels had lower preoccupation scores on the MAAS. They suggested that this could mean that older or more educated women are less worried about the life changes they will experience, or do not place as much value on the pregnancy in relation to role fulfilment (Damato, 2004). However, in conversations during the Baby World classes many of the female participants in the older age ranges spoke about having wanted a baby for a long period of time and therefore feeling very invested in their pregnancy. This suggests that it is not the specific variable such as age that affects attachment, but the context in which the pregnancy has occurred. As a very crude example, if an older participant had been unsuccessfully trying to have a child for many years, and had now become pregnant, they may feel particularly attached to this infant and invested in the pregnancy. If however, a participant of a similar age had not been planning on becoming pregnant but had done so, they may feel less attached. As each further demographic factor is included, the context changes further. Therefore it perhaps appears too simplistic to assume that simple measurements of demographic factors would correlated strongly with antenatal attachment scores.

There was also no difference in sociodemographic variables between those who left the study and those who completed it. It would have been of interest to explore differences in cultural, religious and ethnic groups. However, the sample size was too small for these analyses to be conducted.

4.2.3 Mental Health and Antenatal Attachment

There was a significant negative correlation between depression scores on the HADS and scores on the quality subscale of the MAAS, as well as the total MAAS score. There was a small and non-significant negative correlation between anxiety scores on the HADS and the total MAAS score. This shows that participants with higher depression scores on the HADS showed lower scores specifically on the quality of self-reported antenatal attachment. This is in keeping with previous studies which have

similarly shown that low mood impacts on quality of the attachment but does not seem to relate to the intensity of the attachment (Van Bussel, Spitz & Demyttenaere, 2010; Hart & McMahon, 2006). Hart & McMahon (2006) suggest that this may be because the intensity of the attachment may be determined more by external factors such as employment, whilst the quality of the attachment may be more directly affected by low mood. This finding fits with postnatal findings discussed in the introduction, for example that mothers with chronic depression are more likely to show insecure-disorganised attachment relationships than those without chronic depression (Teit, 1995). There are many theories which provide an explanation for why this might be, including that mothers have less energy to invest in others when suffering themselves and are therefore less likely to form a bond with their infant. This fits with the observation that many people with a diagnosis of depression withdraw socially from those they are connected to.

A further finding relating to mental health and antenatal attachment was that anxiety was found to significantly decrease over the course of the study. This supports the findings of a previous study using a large UK community sample (Heron, O'Connor, Evans et al., 2004) which found that there was a mean decrease in both anxiety and depression scores during pregnancy. Following baseline data collection it was expected that mean depression scores would not significantly reduce over the course of the study, as the initial mean depression score was 4, which was already very low.

4.2.4 Attrition

4.2.4.1 Female Participants

Just under half of female participants who agreed to take part in the study completed the second questionnaire, and just over half completed the final one. A slightly higher proportion of the intervention group stayed in the study. It is important to consider reasons for attrition in order to consider if the sample could have become systematically biased (Breakwell, 2006) and to consider how to improve sample commitment in further studies.

Results showed that there were no significant differences between those who dropped out and those who remained, in relation to the variables measured in the study. However, several people who attended the Baby World class mentioned that they had

found some of the questions in the MAAS and PBI quite distressing and abrupt. It is possible that this led some participants to drop out of the study after completing the questionnaires once. Some participants informed the researcher at the third time point that they were unable to complete the questionnaire because they had given birth earlier than expected. Others who were contacted several times explained that they had been extremely busy leaving their places of employment and preparing their homes and that they had forgotten or not had time to complete the questionnaires. These anecdotal comments suggest that the design of the questionnaires, motivation to be a part of the study and lifestyle may all have affected attrition rates for female participants. In the future the study could be conducted a few weeks earlier in the pregnancy to reduce the likelihood of attrition due to early births and practical life-changes, which occur towards the end of the pregnancy.

4.2.4.2 Male Participants

Only 26 partners consented to participate in the study. This difference between the initial numbers of female and male participants may be due to recruitment differences. Female participants were recruited through their midwives, whilst the contact details of potential male participants were only given if their partners asked them to be a part of the study and they agreed to this. This meant that their participation relied on female participants, who may have not asked partners to participate for a variety of reasons, or may have presented the study in a less appealing way than researchers. Furthermore, if potential female participants had any concerns or worries when initially contacted, they were able to ask the researcher. If any potential male participants had any concerns or worries they were *not* able to immediately ask the researcher. They would then probably have been less motivated to take part in the study, making them less likely to consent to being contacted by the researcher.

It is also possible that fewer males participated because of traditional stereotypes regarding the less-involved role of the father, which the approach of the midwife service and recruitment methodology may have perpetuated. As discussed in the introduction, it has been asserted that fathers are marginalised during pregnancy. Only contacting female participants directly may have implied that their involvement was more important. However, the midwife service only had contact information for expectant mothers, and this limited the researcher's ability to contact expectant fathers directly.

Regarding commitment to the study, only approximately a third of male participants completed the study. Reasons for this might be similar to those given above for female participants; for example males might have found the questionnaires insensitive or upsetting and therefore only completed them at the first time point, or early births might have made them ineligible for completing the questionnaires. This may also relate again to the cultural stereotypes about fatherhood, leaving male participants feeling less invested or motivated to stay in the study.

An interesting observation regarding male participants is that at the first time point a difference in attrition rates between groups was apparent. Whereas only just over half of the control participants completed the first set of questionnaires, all of those who were planning to attend the intervention group completed them. This apparent difference is partly because 5 of the intervention participants had not completed their set of questionnaires when they arrived at the class, so were asked to do it then in a quiet and private area. However, even taking this into account a difference is still present. This difference in attrition rates between the two groups continued throughout the study.

There are several explanations for this difference. Firstly, some studies have found that participants can drop out because they are unhappy with their allocation to a control group (e.g. Kerr et al 2006; Burns et al 2007). It is unlikely that this is the case as participants were not aware which group they were in. An explanation for the initial difference in dropout is that those who knew they were attending the Baby World class felt more pressure to complete the questionnaires as they knew they would be meeting the researchers face-to-face, whereas the control participants felt less pressure and were therefore less likely to complete them. It is possible that following attendance at the Baby World class participants felt more involved in the study and therefore more motivated to complete future questionnaires. In conjunction with this, several studies have noted the positive impact of contact with the researchers on decreasing attrition rates (Jepson et al, 2000). For example, in their study, Dias et al. (2005) found that approximately 90% of participants gave this as their reason for continuing participation in a study, in addition to the standard of care they were receiving.

4.3 Theoretical and Clinical Implications

The conclusions from this study have several implications for current theories and clinical practice. Firstly they strengthen existing findings regarding the increase in antenatal attachment over time, and the relationship between depression and antenatal attachment. They also challenge the link that has been previously suggested between early experiences of caregiving and antenatal attachment, and suggest that other factors may play a mediating role in the relationship.

The findings relating to the first hypothesis also impact on current theories. As discussed in the literature, there is a lack of consensus amongst researchers regarding what constitutes antenatal attachment, with a variety of different measures having been produced as a result. They do not appear to explicitly measure constructs such as mentalization and maternal sensitivity, which are considered to be part of the construct of attachment or very closely related. However, this study suggests there may be an existence of these constructs in the antenatal period, an idea which needs further consideration. Current models of antenatal attachment could possibly be expanded to include clear antenatal definitions of these constructs which could be operationalised through developing new measures. This would enable researchers to explore the links between these constructs antenatally and their impact on the future caregiver-infant relationship, as well as infant development.

There are several clinical implications of this study. The qualitative findings of this study suggest that attendance at the Baby World class may impact on the caregiver-foetus relationship. Attendance may also impact on the caregiver-infant relationship, either by affecting how a caregiver interacts with their infant or by impacting on caregiver well-being or confidence. This will be explored in future studies. As with any pilot study, further research would need to be conducted to provide further support for any of the implications discussed below. As yet these are possible implications based on the mixed findings of this study.

As discussed in the introduction, despite methodological shortcomings many studies have found a relationship between the caregiver-foetus and the caregiver-infant relationships. In turn the caregiver-infant relationship has been found to have a significant effect on development and well-being across the lifespan (Shonkoff & Philips, 2000), as well as having societal and economic implications. The qualitative findings of

this study provide initial support for the argument that services such as the Baby World class could be provided for expectant caregivers. However, before rolling out the Baby World class to a wider audience, further studies exploring the impact of the class would need to be conducted, as the overall results here were mixed. If further studies showed positive outcomes, the class could be considered for wider use. Such services could then be provided as a universal preventative and promotional approach, or specifically to families at higher risk of developing a difficult relationship. Employing a service such as the Baby World class as a universal approach could also provide staff with a useful opportunity to identify caregivers who are at higher risk, so they can work with them more intensively.

In relation to this last point, there are various suggestions as to how the Baby World class could be effectively used. This study used a mainly low-risk sample in order to promote the future caregiver-infant relationship. It is possible that it could have a positive effect if used with known higher-risk groups, such as younger expectant parents, or those with a minimal support network, including people who have recently immigrated to the UK. Anecdotal evidence supports these groups being involved, as the midwife team that collaborated in this study spoke particularly about these two cohorts as being in need of further antenatal support. A small number of studies have explored the difficulties for new immigrants of becoming a new parent in a western society (e.g. Davies and Bath, 2001; Stewart and Jambunathan, 1996). Barclay and Kent (1998) note that non-English speaking first-time parents face several challenges. However, they emphasise the importance of providing cultural and social support services rather than labelling the response to these challenges as mental health difficulties, which could increase stigmatisation. The qualitative findings of this study suggested that the Baby World class provides a positive and empowering experience, which could support non-English speaking participants to feel more supported with their pregnancy and future roles as caregivers. However, it is also possible that the intervention would have a different effect on higher-risk groups, a possibility that future studies could investigate.

If further research found positive outcomes and the Baby World class were to be used for specific populations, it might need some adaptation. Indeed it has been argued that early intervention services must be tailored to the client population (Fonagy, 1998). For example, Berlin et al (1998) found that higher-risk mothers were more responsive to a curriculum that focused on mental health, whilst lower-risk mothers were responsive to a

more education-focused curriculum. Therefore, if the class was given for these groups it is possible that the content of the class would need to be changed accordingly. For example, one useful addition to an adolescent class could be the inclusion of young mothers who could talk about their experience and promote discussion around the specific concerns of this group.

In addition to the content of the class, it is important to consider how the class could be integrated into current clinical service structures. Firstly, the qualitative comments regarding both the standard antenatal classes and the Baby World class suggested that they had different but useful outcomes for the participants. The latter focused on the pregnancy and birth, more of a short-term preparation, and the latter about the baby and the relationship. Therefore in order to provide both short-term and longer-term support for expectant parents, the Baby World class could be combined with standard classes, and form a package.

If the class were to be integrated into midwife services, one important aspect of the service that should be considered is the timing of the classes. Several participants at the Baby World class suggested that the class should take place over a few dates so that participants could have more time to get to know each other and form connections. By either combining the class with standard classes, or adding more dates to the Baby World intervention, this development of a social group could be supported. In particular, many participants at the Baby World classes said that they would have liked some post-natal classes so that they could continue to think about the topics that had been shared antenatally and continue to meet as a group. This might also increase the effectiveness of the intervention, as Barnes and Freude-Lagevardi (2003) found in their review that the most effective interventions were those that began antenatally and continued into the postnatal period. They argued that this develops resiliency and undermines the development of maladaptive coping strategies.

To take the integration of the class into existing services one step further, many psychologists, economists and sociologists have argued that however effective such interventions are, they cannot have the same effect as a more holistic approach. Doctors, Gebhard, Jones and Wat (2008) write about the need for entire systems of support which include psychoeducational classes but also include relevant policies, positive economic strategies and strong links between services. Balbernie (2001) argued that poverty in particular is a vital risk factor that must be responded to, as it

increases the impact of all other risk factors affecting the caregiver-infant relationship. He goes further to argue that even if such therapeutic interventions do improve the caregiver-infant relationship, “results cannot be sustained in a vacuum” and refers to a recent review of interventions which found that *none* ‘made any difference to the income, housing conditions, or employment of the parents involved, despite the fact that the families were often chosen because they had extremely low incomes’ (Farran, 2000, p525, cited in Balbernie, 2001). Therefore, it is important that if the Baby World class were combined with standard antenatal classes, that they form only one part of a support system. An important note of caution is that as with any new intervention being integrated into services, its impact on participants relies on it being appropriately funded and staffed (Balbernie, 2001), which may be an important difficulty in the current financial and political climate.

A final implication of the study refers to the use of an antenatal relationship scale as a screening tool. Many midwife services already use a depression screening tool early in the pregnancy. The findings of this study support this practise, both for caregiver mental health and for the impact it can have on the caregiver-infant relationship, infant development and mental health across the lifespan. However, no measure of antenatal relationship is currently used, despite an increasing body of research which suggests that the antenatal relationship correlates with the postnatal relationship. Further research could therefore explore the impact of including a measure into a basic screening for expectant parents at their initial midwife meeting. Those whose scores suggest they are at risk of developing a poor relationship could be identified and referred to a parent-infant psychology service or a similar service for further support. This could be particularly useful for services which are financially unable to provide positive preventative interventions to their whole population.

4.4 Strengths and Limitations of the Study

There were a number of strengths and limitations in this study which may influence the credence given to the findings.

4.4.1 Contributing to Existing Theory and Research

In the introduction, reference was made to very limited and inconsistent evidence in the area (Gagnon and Sandall, 2000; Salisbury et al, 2003), despite its potential importance.

Therefore, recommendations were made that further research be conducted. In particular, it was recommended that studies should explore if and how antenatal interventions can promote the growth of the caregiver-foetus relationship during and after pregnancy (Schneider, 2002). By developing and exploring the impact of a new antenatal intervention, this study has added to the pool of existing research, and has shown qualitatively that an antenatal intervention may have an impact on aspects of the caregiver-foetus relationship. However, a key limitation of this study is that due to time limits, postnatal outcomes have not yet been collected. Consequently, the impact of the intervention on parenting and the caregiver-infant relationship has not been closely explored. A further study will use caregiver-infant video observations to explore the impact of the intervention and results will be reported elsewhere.

Recommendations for further research in the area have also been made because the operational definition of antenatal attachment is considered inadequate (Salisbury et al, 2003). This study attempted to use the operational definition by Condon (1993) and the measure that relates to this (the MAAS). This study will therefore add to the body of research that has used this definition and the related measures, thus increasing consistency across research. However, as discussed earlier, findings suggested that the definition of antenatal attachment by Condon (1993) is too limited, and further detail needs to be included to increase the clarity of the definition. The findings of this study support the need for a more satisfactory operational definition.

4.4.2 The Population Sample

One strength of the study is that the majority of previous studies in antenatal attachment have only been conducted in the United States with American women (Cannella, 2005). By conducting the study in the UK, the study has widened the population which has been studied, possibly allowing for an exploration of cultural differences in the caregiver-foetal relationship.

4.4.2.1 Gender and Sample Size

One recommendation for future studies discussed earlier was that larger sample sizes should be used (Salisbury et al, 2003), which are more heterogeneous and allow for consideration of cultural issues. This study aimed to have at least 25 participants per group as calculated in section 2.2.3. However, due to difficulties in recruitment and a

fairly high attrition rate, the final sample size did not meet this goal. For the female participants, this meant that aspects of the planned data analysis could not be conducted and changes had to be made. A larger sample size would have allowed for more detailed analysis and increased sensitivity in assessing significance.

Despite attempts to include expectant fathers as participants in all aspects of the study, there was an insufficient final sample for completing statistical analyses. Therefore quantitative findings are only reported in relation to the female participants and thus cannot be generalised to males. This is a significant limitation of the study, as research into fathers and antenatal services has often focused on a failure to include fathers (The Fatherhood Institute, 2008), which this study appears to have perpetuated. As discussed earlier, the indirect recruitment methods for expectant fathers in this study could have led to the low numbers recruited. The decision to use this recruitment method was not sufficiently thoughtful and is representative of a culture where the emphasis antenatally is on females and motherhood. If further research were to be conducted, more robust and equal methods of recruitment should be employed, and reasons for not participating should be explored, to identify if any pre-existing ambivalence, cultural expectations or norms are impacting on the decision. More qualitative investigation of this area may lead to helpful findings regarding the lack of involvement of fathers.

There are several limitations that are associated with the generally small sample size of the study. In particular it had a negative effect on the reliability of the findings and in turn an effect on the generalisability of the findings. Analyses can be found to be non-significant due to the smaller sample size, and distributions may also have been affected.

4.4.2.2 Age, Ethnicity, Employment and Education

Very few participants were aged under 25 years or over 40 years. Furthermore, although almost a quarter were from other ethnic backgrounds (more than in many previous studies), the majority of participants were white. Due to the limited sample size and distributions it was difficult to identify if there were any differences related to age or ethnicity. As a result, findings can only be generalised with caution to those from non-white ethnic backgrounds and those outside the 26 – 40 year age range. It is also very

difficult to explore if the Baby World or standard antenatal classes and the measures are valid across cultures.

The findings show that the study appears to have captured a well-educated and generally employed sample of the population. Approximately three quarters of the sample were in full-time employment and had a qualification from a university. The majority were in a serious relationship. Future research would need to carefully consider recruitment methods to recruit and retain a more representative sample of the population. In particular, the powerful impact of poverty on the caregiver-foetus relationship was discussed earlier (Brooks-Gunn et al., 2000). Although the intervention does not attempt to change the economic status of participants, by not successfully recruiting participants on a low income it is further marginalising this cohort and privileging others.

4.4.2.3 Excluded Cohorts

By not having interpreters available, an entire cohort of potential participants was excluded. Though this was a known limitation of the study, it means that the findings for this cohort were not explored. Consequently, the population sample was not fully representative of the local population. The inclusion of this cohort would also have enabled exploration of the impact of different cultural and religious norms on the caregiver-foetus relationship.

Another cohort that was excluded, this time due to the use of the midwife service for recruitment, was expectant mothers who were not in contact with midwives at all or did not attend appointments. This cohort is potentially at higher risk of having difficulties or needing more support (Rhodes, Ebert & Meyers, 1993). This suggests that the sample was not representative of the local population and reflects the difficulties that NHS services have in providing support to those who are more vulnerable in society. For example, the midwifery service that provided the sample are currently developing services to increase the number of single expectant parents who are under 21 years, as they argue that insufficient numbers of this cohort are accessing their service. Although it is not known how this sample would have responded, the study is more limited because they were not recruited, and generalisability is more restricted.

4.4.2.4 Impact on Validity

The impact of the aforementioned strengths and limitations of the sample relates to the internal and external validity of the study. External validity is the extent to which research findings can be generalised from a sample in order to make predictions about the population, and relates to the sample, the setting and the procedure. By recruiting participants from a local NHS setting and having wide inclusion criteria, external validity was increased. Findings could thus be generalised to other expectant mothers in London. However, as discussed above, limitations around demographic variables such as age, ethnicity and economic status, limit the generalisability of the study. Furthermore, given the high mean and median initial scores of antenatal attachment, it is possible that the study was biased at baseline. This would have negatively impacted on the possible size of the effect of the intervention. This bias could have been due to the characteristics of the initial population. It is also possible that those who dropped out of the study before baseline were more likely to have low levels of attachment and therefore be less interested in taking part in a study about parenting preparation. Thus the generalisability of the findings are limited to those with higher levels of self-reported antenatal attachment.

Internal validity is the extent to which findings can reflect a relationship between the independent and dependent variables. By using a randomised controlled trial (RCT) design, the potential for selection bias and allocation bias was reduced. By randomly allocating participants to groups, they were kept as similar as possible at baseline, meaning that any changes in scores would have a higher likelihood of being due to the independent variables. Other studies have been criticised for not assessing or reporting baseline characteristics (Gagnon & Sandall, 2000), which means that they are open to significant unknown biases. A strength of this study is that baseline characteristics were included and addressed in relation to their possible effect on outcomes. All of these factors increase the internal validity of the study.

4.4.3 Strengths and Limitations of Measures

Recommendations have been made for research in the area to move away from single time-point data collection towards more correlational and longitudinal studies. A strength of this study is that it responded to this recommendation by attempting to

measure change over three time points. Findings could therefore be analysed for change over time and the impact of the Baby World class. Although conducting repeated measurements is important, the choice of the measures is also very relevant.

4.4.3.1 Choice of Measures

The choice of measures in this study is both a strength and a limitation. As discussed in section 2.4, this study solely utilised self-report measures. This limits the study as although they are considered to be validated and reliable measures, it is difficult to know the extent of a possible reporting bias, which may have affected results. The use of a control group prevented the bias from having a very strong effect, but could have led to skewed data at the various time points and across measures.

Some relevant variables were not included in the study. These may have confounded results or mediated relationships between measured variables. These variables include peer relationships, experience of poverty, perceived social support, current attachment style, and social class. The latter factor has been shown to correlate with maternal care scores in the PBI (Parker et al, 1979), so may have further explained findings. Although no study can account for all possible variables, these have been found to have an impact in previous studies and could have been included. Choosing questionnaires can be difficult, as the inclusion of relevant variables must be balanced against overburdening participants with too many measures which may increase attrition. In this study, the variables which were considered most important were chosen. However, if the study was to be repeated, a measure of current attachment style might be substituted for the measure of recalled caregiving (the PBI), as some argue that this is more closely related to antenatal attachment than representations of past caregiving (Ruble et al. 1990). This limitation highlights the difficulty of choosing what to measure in explorative studies.

Other biases may have been introduced to the study with the use of the self-report questionnaires. Regarding the measurement of mental health, the scores on the HADS are based on mood only in the previous week, which could lead to unreliable reports of depression and anxiety. Although it may be a useful screening tool, in this study it was used more to identify longer-term mental health needs, which may have been an inappropriate use of the questionnaire. Furthermore participants may have been

concerned about the consequences of scoring themselves as very low or anxious and thus adapted their scores accordingly.

4.4.3.2 Measuring Antenatal Attachment

The use of any self-report antenatal attachment measure rests on the fundamental assumption that it can capture the unconscious processes which affect the formation of an attachment style. This assumption, whilst accepted in this study, is the subject of some controversy and could be identified as a limitation of the study.

For this study the MAAS and PAAS were chosen as the measure of antenatal attachment. Previous research has repeatedly demonstrated the validity and reliability of the MAAS and PAAS as measures of antenatal attachment. It is also easy to administer as a screening tool and to establish baseline scores for evaluation over time (Van Bussel, Spitz, & Demyttenaere, 2010), and has shown changes in antenatal attachment in previous studies assessing interventions.

A strength of these two measures is that the scores are not categorised, thus small changes in scores can be easily identified. However, this can also be a limitation as it is more difficult to know what a meaningful change in scores is, and how this might translate to postnatal attachment.

All self-report measures are potentially subject to a social desirability bias. This is particularly the case with the area of bonding and parenthood due to a strong social pressure to be a 'good parent'. This pressure has affected the use of other self-report questionnaires in the area, including the Edinburgh Postnatal Depression Scale (EPDS, Cox, Holden, & Sagovsky, 1987). This means that any self-report measures of antenatal attachment such as the MAAS or PAAS are likely to be affected by approval dependency and defensiveness (Sjögren et al. 2004). Van Bussel, Spitz and Demyttenaere (2009) found support for this effect on the MAAS in their study, finding that those with higher scores on the MAAS were also more reluctant to admit to having unfavourable beliefs or behaviours. This may provide some explanation for the generally high scores on the MAAS.

The qualitative findings of this study suggest that although the MAAS has demonstrated reliability, it may not have sufficiently captured all aspects of antenatal attachment.

Possibly a measure of reflective functioning would have been more appropriate as many of the qualitative comments imply that there was a change in this aspect of the caregiver-foetus relationship. Alternatively, it is perhaps more appropriate for use with cohorts who are likely to show initially low quality and intensity of antenatal attachment, which is what the MAAS is purported to measure (Laxton-Kane & Slade, 2002).

Several participants noted that the MAAS in particular asked some insensitive or uncomfortable questions, which may have affected the attrition rate. In the future a more detailed explanation could be given regarding why these questions are being asked before expecting participants to answer them.

4.4.3.3 Measuring Parental Bonding

The PBI asks participants to recall the parenting they received in childhood, and was used to identify the impact of past caregiver relationships on the caregiver-foetus relationship. By using a retrospective measure, this factor could be measured without needing a longitudinal study that spanned both childhood and adulthood, which time restraints would not allow for. However, there are several limitations of using a retrospective measure such as the PBI. For example, research into this form of measurement has shown that they are affected by recall bias because of how participants reconstruct memories (Walker, Skowronski & Thompson, 2003).

In relation to this, as the age range of the study was primarily 26 – 40 years this means that there was significant variance between participants for the length of time that had elapsed between their childhood years and the present day. This difference in amount of elapsed time may have affected how participants remembered or judged the behaviour of their parents. It is also possible that aside from time, other factors over the years affected how the participant remembered their parenting, which reduces the validity of their recollection of parenting. At an extreme, some researchers would claim that recall bias renders the results of retrospective measures both unreliable and invalid (Hardt & Rutter, 2004).

Other factors relating to the PBI provide further strengths and limitations of the study. Scoring the measure provides four separate categories of parental bonding, which allows for clear statistical analyses and meaningful distinctions between participants.

However, it also means that results can be misleading; as a result of using cut-off scores, 2 participants with only slightly different scores on the measure could be placed in different categories. For example, a participant who scores their mother's parental style with a care score of 28 and a protection score of 14 will be in the quadrant entitled "affectionate constraint", whilst another with a care score of 26 and a protection score of 13 will be in the quadrant entitled "neglectful parenting". By conducting correlational analyses it was possible to provide a more detailed understanding of the link between parental bonding and antenatal attachment. If there had been a larger sample size the categories could have been separated into those with borderline scores and those who had more extreme scores, which would have led to a more accurate representation of findings.

4.5 Suggestions for Further Research

As discussed in the introduction to this study, there was a strong rationale for conducting research into the impact of antenatal interventions on the caregiver-foetus and caregiver-infant relationships. This study has added to the evidence base, and there are a wide variety of additional studies that could further advance understanding of how to support and improve these relationships. If further studies were to be conducted they should have larger and more heterogeneous samples. This would allow for results to be generalised to a wider population. It would also mean that the MAAS or a similar measure could be used as a screening tool to split participants into low and high antenatal attachment, and the differential effect on these groups could then be explored.

Barnes and Freude-Lagevardi (2003) suggest that interventions would have more of an impact if they were focused on communities with high levels of adolescent expectant parents and higher rates of poverty. Therefore, as well as increasing sample size, it would be of interest to repeat the study with different groups of participants; such as adolescents and those who have recently moved to the UK. This would show if the intervention is effective for particular groups and also identify if various cohorts had different needs or preferences for antenatal interventions. Continuing to use both qualitative and quantitative methodology with these samples would also provide the opportunity to explore how culturally relevant the existing concept of antenatal attachment is.

Other future studies could include postnatal aspects, such as adapting the current intervention to cover the whole perinatal period and exploring the impact of this. This suggestion is supported both by findings which suggest that perinatal interventions are the most effective (MacLeod & Nelson, 2000), and by the requests of several participants in this study. Alternatively, the intervention could remain as an antenatal class but postnatal measurement could be used to explore the impact of the intervention and the relationship between antenatal and postnatal attachment. In relation to this, if further studies were conducted it would be important to identify any longitudinal impact as much as is feasible. Measuring the impact over months or years would enable cost-benefit analyses to be undertaken which would potentially increase the uptake of such services by government bodies. It would also be important to include the interventions as part of a wider network of services, to highlight the importance of services working together and focusing on a range of issues rather than only one.

Furthermore, the inclusion of other measures mentioned in the discussion earlier, such as a measure of current attachment, would be valuable. In addition, future research could look to develop a more detailed assessment of antenatal attachment or the variables that impact on antenatal attachment, such as including a measurement of antenatal reflective functioning. The study could then explore if the intervention impacts on these variables. The inclusion of post-natal measurements could show if these antenatal constructs map on to the postnatal version of the constructs. The inclusion of more relevant variables would allow for a more detailed and comprehensive exploration of the relationship between variables, and a greater understanding of what variables the Baby World intervention affected.

Any further studies should seriously consider how to recruit participants so that the sample is representative of the population. Furthermore, attention should be paid to how expectant fathers or partners are recruited so that they have an equal chance of participating in the study. In conjunction with this, classes could be adapted to include gender-specific slots, which previous research shows participants have valued (Schmied, Myers, Wills, & Cooke, 2002).

4.6 Conclusion

This study has attempted to contribute to the body of research into the caregiver-foetus relationship. The aim was to develop and explore the impact of a new antenatal psychoeducational group intervention using a combination of quantitative and qualitative analyses. Qualitative results of the study provided some support for the idea that the intervention developed for this study had an impact on the caregiver-foetus relationship, though quantitative findings did not support this. Further research is needed to extend these findings. Existing research suggests that this relationship has the potential to impact on development and well-being across the lifespan. If further research found that the Baby World class had an impact on the relationship, it could be used as a community intervention for early promotion of a strong caregiver-infant relationship, and possibly as a specific intervention to those at risk. However, this would be dependent on the findings of future studies. Suggestions for further research have been proposed above, particularly for at-risk cohorts or combined with other services.

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6 Appendices

Appendix 1: Information Sheet



Information Sheet 1/12/10

Title of Research Study: The Impact of the Antenatal Class “Baby World” on the Parent-Infant Relationship

Name of Researchers: Laura Casale and Dr Tejinder Kondel

We would like to ask you to take part in a research study. This information sheet will tell you about the study so please read it carefully. Take as much time as you need to decide whether or not you wish to take part. Please feel free to ask questions.

What is the purpose of the study?

Research suggests that the relationship between parents and their babies has an impact on the baby’s psychological well-being, social skills and academic abilities. Studies that have been carried out so far suggest that interventions aimed at supporting parents with this relationship have a positive impact both in the short and long-term. These interventions can even take place during the antenatal stage.

However, there is a lack of research into the impact of antenatal group interventions in the UK. As a result of this, it has been recommended that further intervention studies should be conducted in order to examine the impact of antenatal groups that focus on this relationship.

The aim of this study is to explore how attending a particular antenatal group which focuses on this relationship in addition to routine antenatal classes affects the parent-infant relationship.

Why have I been chosen?

We are asking people in your region to take part in the study, as it is supported by your midwives and their teams.

Do I have to take part?

You do not have to take part in this study. If you would prefer not to take part, you do not have to give a reason. Your care from the NHS will not be affected in any way at all.

If you do decide to take part we will ask you to read and keep this information sheet. You will also be asked to read and sign a consent form to show that you understand what is involved in this study. You are free to stop taking part at any time and you do not have to give a reason.

What will happen if I take part?

If you decide to take part you may be invited to attend an antenatal group on one occasion in addition to your routine antenatal classes. This group will take place locally to you and at a time that is convenient for you to attend. The group will last less than 3 hours including breaks. During this group you will have a chance to meet other expectant parents and learn practical skills for bonding with your baby and understanding its needs, which will add to the skills you already have. There will be several opportunities to ask questions and discuss your thoughts with others in the group. It is thought that this intervention may have a positive impact on your baby's development in the postnatal stage.

If you are not asked to attend this extra group you will simply attend the antenatal classes which you have already signed up for through your midwife.

Before attending your antenatal classes for the first time you will be asked to complete some questionnaires which ask you particularly about your feelings regarding your baby. You will be asked to fill in the questionnaires again on one or two more occasions. At the end of one class you may also be asked briefly for your verbal feedback on your experience of the class. However, you will not have to give verbal feedback if you do not wish to.

Once you have had your baby you may be asked if you would like to take part in a further part of the study, however again you will not have to take part if you do not wish. We will speak to your midwife before contacting you at this stage.

Will my information be kept confidential?

Your information will be fully confidential and will only be seen by the research team. The only exception to this is if there is a cause for concern about the well-being of yourself or others. At this time relevant information will be shared with appropriate services in order to address this. You will be informed if this occurs.

Any Questions?

If you have any questions please do not hesitate to ask one of the researchers using the contact details below:

Laura Casale
Department of Clinical Psychology
University of Hertfordshire
College Lane
Hatfield
Herts
AL10 9AB

Tejinder Kondel
Department of Clinical Psychology
University of Hertfordshire
College Lane
Hatfield
Herts
AL10 9AB

e-mail: l.casale1@herts.ac.uk

e-mail: t.kondel@herts.ac.uk

Further Support

If at any time during this study you need any additional emotional support with your pregnancy, you can contact:

Dr Tejinder Kondel
Parent Infant Psychological Therapies Service (PIPS)
Haringey TPCT
St Ann's Hospital
St Ann's Road
London N15 3TH

Tel: 0208 442 6413

Thank you for reading this information sheet.

Appendix 2: Consent Form

Participant Consent Form

Title of Research Study: The Impact of the Antenatal Class “Baby World” on the Parent-Infant Relationship

Name of Researchers: Laura Casale and Dr Tejinder Kondel

Please put your initials in each box when you have read and agreed with the statement:

1) I confirm that I have read and understood the information sheet dated 1/12/10 for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2) I understand that my participation is voluntary and that I am free to leave the study at any time without giving any reason.

3) I agree to take part in the above study

_____	_____	_____
Name of participant	Date	Signature
_____	_____	_____
Name of researcher taking consent	Date	Signature

Appendix 3: Demographic Questionnaire

1. Please enter your code number below as given to you in the e-mail:

2. Please mark if this is the first, second or third time you have completed this questionnaire.

First Second Third

Other (*please specify*):

3. Sex:

Female Male

4. Age:

15 - 20 21 - 25 26 - 30 31 - 35 36 - 40 40 +

5. Is English your first language?

Yes No

If you answered NO, are you a fluent English speaker?

Yes No

6. How would you describe your ethnicity (e.g. mixed - White and Black African, White British, Indian)?

7. Religion - Do you consider yourself to be part of a faith-based community or organisation?

Yes No

8. Please choose your highest level of education:

- Left school before any qualifications
- O-Levels/GCSE's
- A-Levels
- University Degree
- Postgraduate Qualification
- Other (*please specify*):

9. Please choose the answer which best describes your current employment:

- Full time homemaker
- Full time (at least 35 hours per week)
- Part time (less than 35 hours per week)
- Contract work/variable hours
- Unable to work due to injury/disability
- Currently unemployed
- Student
- Other (*please specify*):

10. If you are employed, what is your occupation?

11. What is your current status:

- Single
- Living with partner/married
- Separated/divorced

Widowed

Other (*please specify*):

12. Have you ever been diagnosed with any mental health difficulties (such as depression, addictions, self-harm or anxiety):

None

Minor Difficulties (*please specify below*)

Major Difficulties (*please specify below*)

Other (*please specify*):

13. Was this a planned pregnancy?

Yes No

14. How have you felt during this pregnancy (*please choose the number that best describes how you have felt: 1 = Unwell much of the time, 5 = Well much of the time*):

1 2 3 4 5

15. Have you experienced any miscarriages in the past?

Yes No

16. Is there anything in particular you would like to know more about or have the chance to discuss before your baby is due?

17. Have you attended any antenatal classes outside of the NHS (e.g. NCT)?

Yes No

Other (*please specify*):

Appendix 4: Maternal Antenatal Attachment Scale

MATERNAL ANTENATAL ATTACHMENT SCALE

These questions are about your thoughts and feelings about the developing baby.
Please tick one box only in answer to each question.

- 1) Over the past two weeks I have thought about, or been preoccupied with the baby inside me:

- Almost all the time
- Very frequently
- Frequently
- Occasionally
- Not at all

- 2) Over the past two weeks when I have spoken about, or thought about the baby inside me I got emotional feelings which were:

- Very weak or non-existent
- Fairly weak
- In between strong and weak
- Fairly strong
- Very strong

- 3) Over the past two weeks my feelings about the baby inside me have been:

- Very positive
- Mainly positive
- Mixed positive and negative
- Mainly negative
- Very negative

4) Over the past two weeks I have had the desire to read about or get information about the developing baby. This desire is:

- Very weak or non-existent
- Fairly weak
- Neither strong nor weak
- Moderately strong
- Very strong

5) Over the past two weeks I have been trying to picture in my mind what the developing baby actually looks like in my womb:

- Almost all the time
- Very frequently
- Frequently
- Occasionally
- Not at all

6) Over the past two weeks I think of the developing baby mostly as:

- A real little person with special characteristics
- A baby like any other baby
- A human being
- A living thing
- A thing not yet really alive

7. Over the past two weeks I have felt that the baby inside me is dependent on me for its well-being:

- Totally
- A great deal
- Moderately
- Slightly
- Not at all

8) Over the past two weeks I have found myself talking to my baby when I am alone

- Not at all
- Occasionally
- Frequently
- Very frequently
- Almost all the time I am alone

9. Over the past two weeks when I think about (or talk to) my baby inside me, my thoughts:

- Are always tender and loving
- Are mostly tender and loving
- Are a mixture of both tenderness and irritation
- Contain a fair bit of irritation
- Contain a lot of irritation

10. The picture in my mind of what the baby at this stage actually looks like inside the womb is:

- Very clear
- Fairly clear
- Fairly vague
- Very vague
- I have no idea at all

11. Over the past two weeks when I think about the baby inside me I get feelings which are:

- Very sad
- Moderately sad
- A mixture of happiness and sadness
- Moderately happy
- Very happy

12. Some pregnant women sometimes get so irritated by the baby inside them that they feel like they want to hurt it or punish it:

- I couldn't imagine I would ever feel like this
- I could imagine I might sometimes feel like this, but I never actually have
- I have felt like this once or twice myself
- I have occasionally felt like this myself
- I have often felt like this myself

13. Over the past two weeks I have felt:

- Very emotionally distant from my baby
- Moderately emotionally distant from my baby
- Not particularly emotionally close to my baby
- Moderately close emotionally to my baby
- Very close emotionally to my baby

14. Over the past two weeks I have taken care with what I eat to make sure the baby gets a good diet:

- Not at all
- Once or twice when I ate
- Occasionally when I ate
- Quite often when I ate
- Every time I ate

15. When I first see my baby after the birth I expect I will feel:

- Intense affection
- Mostly affection
- Dislike about one or two aspects of the baby
- Dislike about quite a few aspects of the baby
- Mostly dislike

16. When my baby is born I would like to hold the baby:

- Immediately
- After it has been wrapped in a blanket
- After it has been washed
- After a few hours for things to settle down
- The next day

17. Over the past two weeks I have had dreams about the pregnancy or baby:

- Not at all
- Occasionally
- Frequently
- Very frequently
- Almost every night

18. Over the past two weeks I have found myself feeling, or rubbing with my hand, the outside of my stomach where the baby is:

- A lot of times each day
- At least once per day
- Occasionally
- Once only
- Not at all

19. If the pregnancy was lost at this time (due to miscarriage or other accidental event) without any pain or injury to myself, I expect I would feel:

- Very pleased
- Moderately pleased
- Neutral (ie neither sad nor pleased; or mixed feelings)
- Moderately sad
- Very sad

Scoring and Scales

Quality of attachment:

(3) (6) (9) (10) 11 (12) 13 (15) (16) 19

Time spent in attachment mode (or intensity of preoccupation):

(1) 2 4 (5) 8 14 17 (18)

Item 7 does not load on either factor strongly enough for inclusion on subscales. We usually include it in the global attachment score, and **it should be reversed**.

Items in brackets are reversed scored. Scoring is 1-5, with 5 high attachment

Appendix 5: Paternal Antenatal Attachment Scale

PATERNAL ANTENATAL ATTACHMENT

These questions are about your thoughts and feelings about the developing baby. Please tick one box only in answer to each question.

- 1) Over the past two weeks I have thought about, or been preoccupied with the developing baby:

- almost all the time
- very frequently
- Frequently
- Occasionally
- not at all

- 2) Over the past two weeks when I have spoken about, or thought about the developing baby I got emotional feelings which were:

- very weak or non-existent
- fairly weak
- in between strong and weak
- fairly strong
- very strong

- 3) Over the past two weeks my feelings about the developing baby have been:

- very positive
- mainly positive
- mixed positive and negative
- mainly negative
- very negative

4) Over the past two weeks I have had the desire to read about or get information about the developing baby. This desire is:

- very weak or non-existent
- fairly weak
- neither strong nor weak
- moderately strong
- very strong

5) Over the past two weeks I have been trying to picture in my mind what the developing baby actually looks like in my partner's womb:

- almost all the time
- very frequently
- frequently
- occasionally
- not at all

6) Over the past two weeks I think of the developing baby mostly as:

- a real little person with special characteristics
- a baby like any other baby
- a human being
- a living thing
- a thing not yet really alive

7) Over the past two weeks when I think about the developing baby my thoughts:

- are always tender and loving
- are mostly tender and loving
- are a mixture of both tenderness and irritation
- contain a fair bit of irritation
- contain a lot of irritation

8) Over the past two weeks my ideas about possible names for the baby have been:

- very clear
- fairly clear
- fairly vague
- very vague
- I have no idea at all

9) Over the past two weeks when I think about the developing baby I get feelings which are:

- very sad
- moderately sad
- a mixture of happiness and sadness
- moderately happy
- very happy

10) Over the past two weeks I have been thinking about what kind of child the baby will grow into:

- not at all
- occasionally
- frequently
- very frequently
- almost all the time

11) Over the past two weeks I have felt:

- very emotionally distant from the baby
- moderately emotionally distant from the baby
- not particularly emotionally close to the baby
- moderately close emotionally to the baby
- very close emotionally to the baby

12) When I first see the baby after the birth I expect I will feel:

- intense affection
- mostly affection
- affection, but I expect there may be a few aspects of the baby I will dislike
- I expect there may be quite a few aspects of the baby I will dislike
- I expect I might feel mostly dislike

13) When the baby is born I would like to hold the baby:

- immediately
- after it has been wrapped in a blanket
- after it has been washed
- after a few hours for things to settle down
- the next day

14) Over the past two weeks I have had dreams about the pregnancy or baby:

- not at all
- occasionally
- frequently
- very frequently
- almost every night

15) Over the past two weeks I have found myself feeling, or rubbing with my hand, the outside of my partner's stomach where the baby is:

a lot of times each day

at least once per day

occasionally

once only

not at all

16) If the pregnancy was lost at this time (due to miscarriage or other accidental event) without any pain or injury to my partner, I expect I would feel:

very pleased

moderately pleased

neutral (ie neither sad nor pleased; or mixed feelings)

moderately sad

very sad

Factor structure

() denotes reverse scoring. Scoring is 1 (low attachment) to 5 (high attachment)

Quality of attachment:

(1) 2 (3) (7) 9 11 12 16

Time spent in attachment mode:

4 (5) (8) 10 14 (15)
(or intensity of preoccupation)

Items 6 and 13 do not load on either factor strongly enough for inclusion on subscales

Appendix 6: Parental Bonding Instrument

NB. Participants given one form for their mother and one for their father, with wording made appropriate for that parent.

This questionnaire lists various attitudes and behaviours of parents. As you remember your MOTHER/FATHER in your first 16 years would you place a tick in the most appropriate box next to each question.

My mother/father:

	Very like	Moderately like	Moderately unlike	Very unlike
a. Spoke to me in a warm and friendly voice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Did not help me as much as I needed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Let me do those things I liked doing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Seemed emotionally cold to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Appeared to understand my problems and worries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Was affectionate to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Liked me to make my own decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Did not want me to grow up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Tried to control everything I did	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Invaded my privacy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Enjoyed talking things over with me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Frequently smiled at me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

m. Tended to baby me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. Did not seem to understand what I needed or wanted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o. Let me decide things for myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
p. Made me feel I wasn't wanted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
q. Could make me feel better when I was upset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
r. Did not talk with me very much	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
s. Tried to make me feel dependent on her/him	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
t. Felt I could not look after myself unless she/he was around	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
u. Gave me as much freedom as I wanted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
v. Let me go out as often as I wanted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
w. Was overprotective of me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
x. Did not praise me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
y. Let me dress in any way I pleased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix 7: Hospital Anxiety and Depression Scale

Read each item and tick the box which comes closest to how you have been feeling IN THE PAST WEEK. Don't take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought out response.

39. I feel tense or 'wound up':

- Most of the time
- A lot of the time
- Time to time, occasionally
- Not at all

40. I still enjoy the things I used to enjoy:

- Definitely as much
- Not quite so much
- Only a little
- Not at all

41. I get a sort of frightened feeling like something awful is about to happen:

- Very definitely and quite badly
- Yes, but not too badly
- A little, but it doesn't worry me
- Not at all

42. I can 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

43. Worrying thoughts go through my mind:

- A great deal of the time
- A lot of the time
- From time to time but not too often
- Only occasionally

44. I feel cheerful:

- Not at all
- Not often
- Sometimes
- Most of the time

45. I can sit at ease and feel relaxed:

- Definitely
- Usually
- Not often
- Not at all

46. I feel as if I am slowed down:

- Nearly all of the time
- Very often
- Sometimes
- Not at all

47. I get a sort of frightened feeling like 'butterflies in the stomach':

- Not at all
- Occasionally
- Quite often
- Very often

48. I have lost interest in my appearance:

- Definitely
- I don't take as much care as I should
- I may not take quite as much care
- I take just as much care as ever

49. I feel restless as if I have to be on the move:

- Very much indeed
- Quite a lot
- Not very much
- Not at all

50. I look 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

51. I get sudden feelings of panic:

- Very often indeed
- Quite often
- Not very often
- Not at all

52. I can enjoy a good book or radio or TV programme:

- Often
- Sometimes
- Not often
- Very seldom

Appendix 8: Qualitative Measure

Participants were asked the following two questions in their questionnaire:

1) If you attended the class called Baby World please write a little about its impact on you, your thoughts about your baby or any other feedback you feel may be useful.

2) Please write a little about the impact of your standard antenatal classes on you, your thoughts about your baby or any other feedback you feel may be useful, including what you were left feeling about your baby following the classes.

Appendix 9: Descriptive Statistics for HADS Scores at Baseline

Descriptive statistics for the HADS subscales and total score. Minimum values (Min), maximum values (Max), means (M), standard deviations (SD), medians (Md), skewness and kurtosis.

	Subscale	Min.	Max.	<i>M</i>	<i>Mdn</i>	<i>SD</i>	Skewness	Kurtosis
Control	Anxiety	0	14	6.91	7	3.40	-0.27	0.26
	Depression	0	11	3.96	3	2.88	1.00	0.33
Intervention	Anxiety	1	15	7.47	8	3.74	0.02	-0.45
	Depression	0	13	4.06	3	2.94	1.09	1.00
Total	Anxiety	0	15	7.25	8	3.59	-0.51	-0.26
	Depression	0	13	4.02	3	2.89	1.031	0.59

Frequencies and percentages of the HADS scores of the sample.

	Subscale		Normal	Mild.	Moderate	Severe	Total
Control	Anxiety	Frequency	12	8	3	0	23
		Percentage	52.2%	34.8%	13.0%	0%	100%
	Depression	Frequency	20	2	1	0	23
		Percentage	87.0%	8.7%	4.3%	0%	100%
Intervention	Anxiety	Frequency	15	137	4	2	34
		Percentage	44.1	38.2	11.8	5.9	100%
	Depression	Frequency	28	5	1	0	34
		Percentage	82.4%	14.7%	2.9%	0%	100%
Total	Anxiety	Frequency	27	21	7	2	57
		Percentage	47.4%	36.8%	12.3%	3.5%	100%
	Depression	Frequency	48	7	2	0	57
		Percentage	84.2%	12.3%	3.5%	0%	100%

Appendix 10: Descriptive Statistics for MAAS Scores at Baseline

Descriptive statistics for the MAAS subscales and total score at T1, T2 and T3. Minimum values (Min), maximum values (Max), means (M), standard deviations (SD), medians (Md), skewness and kurtosis of the MAAS subscales and total score.

Time	Group	Subscale	Min.	Max.	<i>M</i>	<i>Mdn</i>	<i>SD</i>	Skewness	Kurtosis
T1	Control (n = 23)	Quality	37	49	45.26	47	3.39	-1.037	-0.038
		Intensity	21	37	28.26	29	4.545	-0.091	-1.148
		Total	63	90	78.09	79	7.897	-0.489	-0.797
	Intervention (n = 27)	Quality	34	50	45.00	47	4.114	-0.945	-0.038
		Intensity	23	36	28.41	30	3.343	-0.171	-0.887
		Total	61	89	77.81	80	7.071	-0.569	-0.450
	Total (n = 50)	Quality	34	50	45.12	47	3.761	-0.977	0.253
		Intensity	21	37	28.34	29	3.900	-0.011	-0.914
		Total	61	90	77.94	80	7.386	-0.505	-0.680
T2	Control (n = 20)	Quality	40	50	46.9	47.5	2.732	-1.002	0.577
		Intensity	23	37	29.95	30	4.371	-0.026	-0.508
		Total	66	91	81.4	82.5	7.089	-0.609	-0.149
	Intervention (n = 23)	Quality	39	50	46.09	47	3.161	-0.626	-0.456
		Intensity	23	36	29.74	30	3.208	0.015	-0.377
		Total	70	91	80.26	82	6.069	-0.05	-1.049
	Total (n = 43)	Quality	39	50	46.47	47	2.963	-0.778	-0.185
		Intensity	23	37	29.84	30	3.748	0.014	-0.331
		Total	66	91	80.79	82	6.508	-0.318	-0.652
T3	Control (n = 20)	Quality	39	50	47.25	47.5	3.007	-1.313	1.562
		Intensity	24	39	30.85	31	4.614	-0.357	-0.929
		Total	69	94	82.70	83	7.406	-0.159	-0.870
	Intervention (n = 23)	Quality	40	50	46.43	47	2.809	-0.598	1.562
		Intensity	25	35	30.35	31	2.673	-0.331	-0.376
		Total	73	90	81.30	81	5.121	-0.035	-1.343
	Total (n = 43)	Quality	39	50	46.81	47	2.897	-0.872	0.169
		Intensity	24	39	30.58	31	3.666	0.349	-0.185
		Total	69	94	81.95	82	6.249	0.001	-0.751

Appendix 11: ANCOVA Results for Covariates at Time 2 and Time 3

Tests of Between-Subjects Effects at T2

Dependent Variable:T2MAASTotal

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1335.778 ^a	5	267.156	23.144	.000
Intercept	84.134	1	84.134	7.289	.011
EthnicityCode	1.412	1	1.412	.122	.729
d					
MentalHealth	.906	1	.906	.078	.781
PlannedPreg	4.574	1	4.574	.396	.533
T1MAASTotal	1287.944	1	1287.944	111.576	.000
GroupCode	8.356	1	8.356	.724	.401
Error	415.555	36	11.543		
Total	275050.000	42			
Corrected Total	1751.333	41			

a. R Squared = .763 (Adjusted R Squared = .730)

Tests of Between-Subjects Effects at T3

Dependent Variable:T3MAASTotal

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1126.904 ^a	5	225.381	18.904	.000
Intercept	131.735	1	131.735	11.049	.002
EthnicityCode	4.483	1	4.483	.376	.544
d					
MentalHealth	16.040	1	16.040	1.345	.254
PlannedPreg	4.353	1	4.353	.365	.549
T1MAASTotal	1089.282	1	1089.282	91.362	.000
GroupCode	1.956	1	1.956	.164	.688
Error	429.215	36	11.923		
Total	282163.000	42			
Corrected Total	1556.119	41			

a. R Squared = .724 (Adjusted R Squared = .686)

Appendix 12: Ethical Approval Document



National Research Ethics Service

Central London REC 4
Research Ethics Committee Offices
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Telephone: 020 7794 0500 x34836

08 October 2010

Miss Laura Casale
Trainee Clinical Psychologist
Cambridgeshire and Peterborough
NHS Mental Health Trust
DClinPsy Prog, School of Psychology
University of Hertfordshire
Hatfield, Herts
AL10 9AB

Dear Miss Casale

Study Title: An Exploratory Study Examining the Impact of a
Psychoeducational Group about Attachment on the
Caregiver-Infant Relationship
REC reference number: 10/H0715/52

Thank you for your letter of 25 September 2010, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered by a sub-committee of the REC at a meeting held on 08TH October 2010. A list of the sub-committee members is attached.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

This Research Ethics Committee is an advisory committee to the London Strategic Health Authority
The National Research Ethics Service (NRES) represents the NRES Directorate within
the National Patient Safety Agency and Research Ethics Committees in England

For NHS research sites only, management permission for research ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>.

Where the only involvement of the NHS organisation is as a Participant Identification Centre (PIC), management permission for research is not required but the R&D office should be notified of the study and agree to the organisation's involvement. Guidance on procedures for PICs is available in IRAS. Further advice should be sought from the R&D office where necessary.

Sponsors are not required to notify the Committee of approvals from host organisations.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Investigator CV		12 August 2010
Protocol		19 July 2010
CV: Dr Tejinder K Kondel-Laws		12 August 2010
REC application		11 August 2010
Letter from Sponsor		
Questionnaire: Maternal Antenatal Attachment Scale (MAAS) Condon, 1993		
Questionnaire: Maternal Postnatal Attachment Scale (MPAS) Condon, Corkindale & Boyce, 1998		
GP/Consultant Information Sheets	1	17 September 2010
Participant Information Sheet	2	18 September 2010
Response to Request for Further Information		25 September 2010
Participant Consent Form	1	11 August 2010
Questionnaire: Paternal Antenatal Attachment Scale (PAAS) Condon, 1993		
Questionnaire: Parental Bonding Instrument (PBI) Parker et al, 1979		
Questionnaire: Hospital Anxiety and Depression Scale (HADS) Zigmond&Snaith, 1983		
Questionnaire: Paternal Postnatal Attachment Scale (PPAS) Condon, Corkindale&Boyce, 2008		
Questionnaire: Mothers' Object Relations Scales (MORS) Oates&Gervai, 2003		
Evidence of insurance or indemnity		01 August 2010

Statement of compliance

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

After ethical review

Now that you have completed the application process please visit the National Research Ethics Service website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Progress and safety reports
- Notifying the end of the study

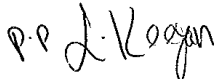
The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email referencegroup@nres.npsa.nhs.uk.

10/H0715/52

Please quote this number on all correspondence

Yours sincerely



**Professor David Katz
Chair**

Email: Laura.Keegan@royalfree.nhs.uk

Enclosures: List of names and professions of members who were present at the meeting

"After ethical review – guidance for researchers"

Central London REC 4

Attendance at Sub-Committee of the REC meeting on 08 October 2010

Committee Members:

<i>Name</i>	<i>Profession</i>	<i>Present</i>	<i>Notes</i>
Professor David Katz	Professor of Immunopathology	Yes	
Mrs Michelle McPhail	Lay member	Yes	

Also in attendance:

<i>Name</i>	<i>Position (or reason for attending)</i>
Miss Laura Keegan	REC Co-ordinator

