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The Relationship with the Unborn Baby: Why it Matters

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Pregnancy is an important opportunity for parents to develop a relationship with the unborn baby, and two ways of assessing this have been developed over the past few decades. The first focuses on the intensity and quality of the mother's emotional reactions (i.e. known as maternal-foetal attachment – MFA) and the second focuses on her images of the baby (i.e. known as maternal representations). This BPG will summarise the findings of research examining the impact of this developing relationship with the unborn baby, in terms of both parent-infant interaction and the baby's attachment status in the postnatal period. It will describe the potential pathways by which such representations exert their influence, and conclude by examining the implications for practice.

INTRODUCTION

During the past two decades, there has been an increase in recognition of the importance of the developing relationship with the unborn baby in terms of both health behaviours in pregnancy and parenting in the postnatal period. Two parallel ways of thinking about the mother's relationship with the fetus have developed during this time, which on the whole continue to be researched separately using different methods.

The first of these approaches evaluates the parent's emotional feelings toward the unborn baby, using measures that assess what has been described as the maternal foetal attachment (MFA) (or paternal foetal attachment – PFA) (see below for further discussion about this term). A second stream of research has focused at a more cognitive level on what are described as 'maternal representations', which refers to the mother's conscious and unconscious mental images and thoughts about her baby. Pregnancy is recognized to be a unique period in the sense that representations of self and others are reactivated and reorganized in response to the developing relationship with the unborn baby, and research has focused on the mother's representations of her baby; herself as a mother; and her relationship with her own mother. The representations that mothers develop of their children, both pre and post-birth represent internal subjective experiences of the relationship with the baby/child, and provide information about the 'meaning' a child already has to his or her mother (Vreeswijk, Maas, van Bakel, 2012).

There is interest in the parent's relationship with the baby during pregnancy because a number of studies have suggested that this relationship predicts the quality of the parent-infant interaction in the postnatal period (e.g. Benoit et al., 1997), and the infant's attachment at 1 year (e.g. Theran et al., 2005). This is important because parent-infant interaction has been shown to be an important predictor of infant attachment security (DeWoolf, 1997), and attachment security is associated with better outcomes in childhood across all developmental domains (Sroufe, 2005), while an insecure or disorganised attachment is associated with later developmental problems and psychopathology (e.g. Fearon et al., 2010; Steele & Siever, 2010; Van Ijzendoorn, Schuengel, Bakermans-Kranenburg,1999).

This BPG summarises what the research tells us about the relationship between all measures of the parental fetal relationship in pregnancy,

and later outcomes postnatally, with a specific focus on parent-infant interaction and infant attachment security at 1 year (it does not include other measures of outcome such as cognitive development etc). It begins by summarising some of the definitional issues that have beset the study of this relationship, and the key methods by which the PFR has been measured. It goes on to examine what the research tells us about the stability of this relationship over time, some of the risk or protective factors in terms of its development, and the relationship between measures of this relationship with the baby in pregnancy, and later outcomes. The BPG concludes by examining the implications for practice in terms of key groups of practitioners working with pregnant women.

DEFINITIONAL ISSUES

The concept of 'fetal attachment' originated inpart from the attachment research of Bowlby (1962), and early observations that pregnant women show both increasing feelings of protectiveness towards the fetus over the three trimesters of pregnancy and signs of significant grief following a stillbirth (See Brandon, 2010, for an overview). The relationship that is developing with the unborn baby has behavioural, emotional and cognitive components. So, for example, pregnant women engage in behaviours that are protective of the unborn baby such as changing what they are eating and stopping risky behaviours such as smoking and drinking alcohol. In terms of emotions, pregnant women often talk about feelings of love and connection to the unborn baby, and in terms of cognitions, as the pregnancy progresses, they begin to articulate their thoughts about what this baby will be like in terms of his or her characteristics. The tools that have been designed to measure this relationship capture some of these different components.

However, the use of the term 'attachment' to refer to the mother's feelings of closeness to the infant is confusing because it is not the mother's 'attachment system' that is involved in these changes, but her 'caregiving system'. The attachment system is triggered in both children and adults at time of stress, and our attachment status (i.e. Secure, Insecure or Disorganised) influences the strategy that we adopt in the face of such stress. As has been argued by others (Brandon, 2010; Walsh, 2010), it is not as such accurate to refer to the parents' feelings towards the unborn baby as being part of their attachment system, because the feelings of protectiveness and love towards the fetus that develop over the course of the pregnancy, and that get stronger during the third trimester, do not reflect the search for comfort that is part of the attachment system, but a desire to protect the unborn baby which is part of the parental 'caregiving' system' (Bowlby, 1982). As such, the development of the term 'prenatal attachment' and corresponding naming of such tools (e.g. Maternal Fetal Attachment Scale - MFAS), are misleading. The parents' developing feelings toward the unborn/newborn baby are more accurately referred to as bonding. The term parental fetal relationship (PFR) will be used throughout the remainder of this BPG to refer to all aspects of the relationship with the unborn baby.

ASSESSMENT OF THE PARENTAL FETAL RELATIONSHIP (PFR)

As was suggested above, there have been two streams of research that have measured the relationship with the unborn baby. The first of these involves the use of brief self-report questionnaires to assess the so called parental fetal attachment (e.g. emotions), an approach that belongs within the personality/social psychology field, while the second stream involves the use of interview schedules (although more recently, a number of self-report tools have been developed as well) focusing on maternal representations (cognitions) about the unborn baby, that have emerged from the field of developmental/clinical psychology (see Brandon, 2010, for more detail).

MATERNAL/PATERNAL FETAL ATTACHMENT

TOOLS TO ASSESS PRENATAL FETAL ATTACHMENT

The three most used parent-report tools to assess the level of attachment that a parent feels to the unborn baby are:

- The Maternal-Fetal Attachment Scale (MFAS) / Paternal Fetal Attachment scale (PFAS)
- The Prenatal Attachment Inventory (PAI)
- The Maternal Antenatal Attachment Scale (MAAS) and Paternal Antenatal Attachment Scale (PAAS)

A systematic review found that at least three parent-report tools have been developed to assess the level of attachment that the parent feels toward the unborn baby (Perrelli et al., 2014). These tools were developed sequentially, with later models building on the perceived inadequacies of the former versions (Brandon, 2009). So, for example, while the first tool to be developed focused primarily on behaviour (e.g. MFA - see below for further detail), the next tool to be developed focused more on the emotional aspects of the relationship (e.g. the PAI) with the most recent of these tools (e.g. MAAS) remedying the deficiencies of earlier versions in being multi-dimensional and aiming to capture both quality and intensity of the relationship (ibid).

The first tool to be developed was the Maternal-Fetal Attachment Scale (MFAS) and the PFAS for fathers, and is based on 23 questions that comprise 5 domains – a) self-differentiation and differentiation of the fetus, b) interaction with the fetus, c) attributing characteristics to the fetus, d) donating oneself and e) taking

responsibility (Cranley, 1981). This was followed by the Prenatal Attachment Inventory (PAI), which comprises 21 items and is designed to measure the overall feelings of affection between a mother and her fetus (Muller, 1993). However, unlike the other measures it has only one domain. While this tool remedied the deficiencies of the MFAS in terms of focusing on the emotional relationship, it treated the relationship as being uni-dimensional. In an attempt to remedy both of these deficiencies, Condon (1993) developed the Antenatal Attachment Scale, which is also available in two versions; the maternal version (MAAS) comprises 19 items, and the paternal version (PAAS) 16 items, which consist of two domains measuring the 'quality' of the mother's affective experiences with the unborn baby (e.g. closeness/distance; tenderness/irritation; positive/negative; joyful/unpleasant; vivid/vague) and the 'intensity' in terms of the amount of time spent thinking about the baby (e.g. talking to the baby; dreaming about or interacting with him/her). The two continuums are then mapped in terms of four types of MFA style – a) Strong/healthy attachment; b; Positive quality of attachment but low preoccupation due to distraction or avoidance; c) Uninvolved or ambivalently involved with low preoccupation, and d) Anxious, ambivalent or affectless preoccupation (See Brandon et al., 2009:210). These 'styles' of attachment to the baby correspond to the scores produced by assessments of an adult's attachment style as measured using the Adult Attachment Inventory (i.e. Secure; Anxious-preoccupied; Dismissive-avoidant; Fearful-avoidant) (Hazen & Shaver, 1987).

PRENATAL REPRESENTATIONS

A range of tools have been developed to examine the mother's mental representations of her unborn baby. Most tools include interview-based techniques such as the Working Model of the Child Interview (WMCI) (Zeanah et al.,1986); Pregnancy Interview (PI) (Slade, 2007; Slade, Grunebaum, Huganir, & Reeves, 1987), and Interview of Maternal Representations (IRMAG) (Ammaniti, Tambelli & Perucchini 1998; Ammaniti et al., 1992). Parent-report measures include the Child Concept Questionnaire (CCQ) (Gloger-Tippelt, 1983).

The Working Model of the Child Interview (WMCI), which is the most frequently used measure, is a semi-structured interview comprising 28 initial probes to examine the parent's representations or working model of their relationship to a particular child either pre or post birth. It identifies three categories of relationship - 'Balanced', 'Disengaged' or 'Distorted'. Women who are described as 'Balanced', for example, can provide rich and detailed information about their experiences of their pregnancies, and these narratives are on the whole highly coherent. These pregnant women talk fluidly not only about their positive thoughts and feelings about their unborn baby but also their negative feelings. Women who are 'Disengaged', however, appear to be uninterested in the unborn baby or their relationship with him or her. They also show little interest in what their babies' future traits and behaviours might look like, or in themselves as mothers. Women described as 'Distorted' tend to express intrusive or tangential thoughts about their own experiences as children, and these women also often view their unborn baby primarily as an extension of themselves or their partner (Levendosky, 2011:11). More recently, a further category - 'Disrupted' - has been added, aimed at capturing the aspects of parental behaviour that are associated with disorganized attachment in the child (Crawford et al., 2009).

The Pregnancy Interview (PI) is a semi-structured clinical interview with 39 questions and probes, developed to assess the quality of a mother's representation of her relationship with her unborn child. The interview, which is administered during the third trimester, assesses a variety of aspects of the mother's views about her emotional experience with pregnancy and her expectations and fantasies regarding her future relationship with her child. The mother is asked to describe her current relationship to the fetus as well as what she imagines her baby will be like. In addition, the interview aims to capture the mother's pre-natal representations of herself as a caregiver, focusing in particular on the mother's capacity to identify with, respond to, and anticipate the needs of her fetus at present and her newborn in the near future. In contrast to the WMCI (with classifications as Balanced, Disengaged or Distorted), the PI produces an overall reflective functioning (RF) score ranging from 1 to 9 with scores of less than five suggesting low RF.

The IRMAG (Ammaniti, Tambelli & Perucchini, 1998; Ammaniti et al., 1992) consists of 47 semi-structured questions, aimed at examining parents' narrative organization in terms of seven domains (i.e. Richness of perceptions, Openness to change, Affective engagement, Coherence, Differentiation, Social referencing and Emergence of fantasies), with regard to the unborn baby, and allows for the identification of three types of parental mental representation: Integrated/Balanced, Restricted/Disinvested, and Not Integrated/Ambivalent. IRMAG – R is a slightly shorter (i.e. 41 items) version of the IRMAG (Ammaniti & Tambelli, 2010; Ammaniti et al 1999).

The Child Concept Questionnaire (CCQ) (Gloger-Tippelt, 1983) is a parent-report measure comprising 29 items that produce 5 subscales – Desirability of the unborn child; Anxiety about the child's health; Body concept of the unborn child; Relationship with the unborn child; and the Child as an individual after birth. This self-complete questionnaire is aimed at identifying both cognitive and emotional aspects of the mother's mental representations of her current and future baby.

TOOLS TO ASSESS PRENATAL REPRESENTATIONS OF THE BABY

The most commonly used tools to measure parental representations of the baby in pregnancy are as follows:

- The Working Model of the Child Interview (WMCI)
- The Pregnancy Interview (PI)
- The Interview of Maternal Representations (IRMAG)
- The Child Concept Questionnaire (CCQ)

STABILITY

Research shows a high level of stability in terms of the maternal fetal relationship as assessed in terms of its representations. For example, a recent systematic review of the Working Model of the Child Interview (WMCI) (Vreeswijk et al., 2015) found a significant association between prenatal and postnatal representations, but also found significant differences in the distributions of mothers' prenatal and postnatal classifications, with mothers having more Balanced representations and less Disengaged representations in the postnatal period than they did in the prenatal period (Vreeswijk et al., 2015). This suggests that some women change classification over this period, possibly as a consequence of life events such as a traumatic birth in the case women who move from a Balanced to an Unbalanced representation. However, Theran et al. (2005) found that women who were classified as 'Balanced' prenatal and 'Unbalanced' postnatal had better interactions with their baby than those who were classified as 'Unbalanced' at both time-points, suggesting a buffering impact for such representations in pregnancy even if they are not maintained.

PROTECTIVE AND RISK FACTORS

A number of studies have examined the factors that are associated with both measures of parental fetal attachment and parental representations of the baby. For example, a recent review examined a range of potential individual (e.g. personality, age etc.), relational (e.g. marital relationship, family alliance etc.), and contextual factors (e.g. prenatal screening, treatment, IVF etc); it found that factors such as disordered eating behaviours and depression, detachment and ambivalence about the pregnancy, smoking during pregnancy and lack of social support were negatively associated with MFA. Factors that appeared to be positively associated with MFA included attitude to childbearing and awareness of the fetus, psychological maturity, marital satisfaction, perception of support from partner, and a secure attachment style with partner (Cataudella et al., 2016). For fathers, ambivalence about the pregnancy and detachment were negatively associated with attachment to the fetus, while psychological maturity and marital satisfaction were positively associated with attachment.

An earlier meta-analysis of 14 potential predictors found that gestational age had a moderate to large impact, and that anxiety, self-esteem, depression, whether the pregnancy was planned, age, parity, ethnicity, marital status, income and education had small or no effects (Yarcheski et al., 2009).

Similarly, maternal representations of the baby have also been found to be influenced by a range of factors including the presence of two to three children under 7 years in the household and planning of the current pregnancy; childhood maltreatment; domestic violence; prenatal health behaviours; maternal personality traits (e.g. openness and agreeableness; conscientiousness; extraversion); object relational experiences of self and other marital adaptation; maternal education, social support and substance use. Recently Vreeswijk et al. (2015) found that mothers having more risk factors during pregnancy were more likely to have Distorted than Balanced or Disengaged prenatal representations.

WHAT IS THE RELATIONSHIP BETWEEN ATTACHMENT/REPRESENTATIONS AND LATER PARENTAL FUNCTIONING?

The next section of this BPG presents the findings of a number of longitudinal studies that have examined the relationship between these measures in pregnancy and later outcomes in the postnatal period.

MATERNAL FETAL ATTACHMENT (MFA) IN PREGNANCY AND LATER OUTCOMES

Only a few studies have examined the relationship between MFA, using the instruments referred to above, and parent-infant interactions postnatally, and there have been no studies of the association between MFA and infant attachment security (see reviews by Alhusen, 2008; Cannelli, 2005).

The most recent rigorous studies have measured the association between maternal-fetal attachment in the third trimester of pregnancy and the association with sensitive caregiving of the infant in the first year of life, using objective measures of outcomes (i.e. videotapes of the interaction that are then coded using a standardised tool). One study found an association between the MAAS and two out of three aspects of sensitivity (measured using the National Institute of Child Health and Development (NICHD) Global Rating Scale) - sensitivity in free play and caregiving, but not face-to-face play (Maas et al., 2016). Similarly, Alvarenga et al. (2013) found an association between the MFAS and sensitivity (using independent observation of the interaction) at 8 months postnatal. A third study measured the association between maternal fetal attachment and maternal mind-mindedness (an objective assessment of the ability of the parents to understand the infant's emotions and to respond appropriately), and showed a significant

association between MFA and mind-mindedness at both the 7th and 19th months postnatally.

These findings contribute to a body of earlier research, some of which involved small samples and no independent observations of outcome, but that also found an association between MFA and caretaking (Bloom,1995); sensitivity and involvement at 3 months (Siddique & Hagloff, 2000); mother-infant attachment at 1-2 months (Damato 2004; Muller, 1996); maternal infant attachment in both low- and high-risk women, immediately postpartum but not at 8 months (Mercer & Ferketich, 1990); maternal-infant interaction immediately postpartum in low-risk women (Fuller 1990); and maternal sensitivity, self-identify and identification with baby at 1-6 weeks (Shin et al., 2006).

MATERNAL REPRESENTATIONS OF THE BABY IN PREGNANCY AND LATER OUTCOMES

A number of studies have examined the association between maternal representations of the baby in pregnancy and parent-infant interaction, and infant attachment security.

a) Infant attachment

At least eight studies have examined the association between maternal representations in pregnancy and infant attachment security at 12 – 14 months as measured by the Strange Situation Procedure (SSP: Ainsworth, 1971). Six of these studies used the WMCI to classify maternal prenatal representations with one study (Crawford et al., 2009) adding a further 'Disrupted' category and another (Atkinson et al., 2009) an 'Irrational fear' category, to the existing 'Balanced', 'Disengaged' and 'Distorted' categories. The additional categories are aimed at capturing the type of representations that are associated with caregiver behaviours that are linked with Disorganized attachment, and that are captured using the Atypical Maternal Behaviour Instrument for Assessment and Classification or AMBIANCE (Bronfman, 1992 - 2009). The studies by Atkinson et al. (2009) and Crawford et al. (2009) showed that both of these additional categories were significantly associated with a Disorganized classification

Five studies that used the standard WMCI classifications (Madigan, 2015; Huth-Bocks, 2011; 2004; Atkinson et al., 2009; Benoit, 1997) showed strong associations between a 'Balanced' WMCI and 'Secure' attachment classification postnatally, although one study showed a borderline significant association between the overall WMCI and Strange Situation (SS) classifications (Atkinson et al., 2009) and another showed no relationship unless the four attachment classifications were collapsed (i.e. into Secure and Insecure only), due to a range of contextual risk factors, including maternal depression and infant behaviours (Hugh-Bocks et al., 2011). Huth-Bocks et al. (2004) found a strong association between intimate partner violence (IPV) and mothers' prenatal representations of their infants in a sample of 206 women of whom 44% reported some domestic abuse. However, Dayton et al. (2010) found that the strong association between prenatal representations and parenting behaviour at 1 year postpartum was not mediated by exposure to IPV either pre- or postnatally, suggesting thereby that prenatal representations influence postnatal parenting behaviour for both abused and non-abused women.

THE IMPORTANCE OF PRENATAL REPRESENTATIONS

The research supports the suggestion that maternal representations in pregnancy are an important predictor of infant attachment security, and parent-infant interaction

b) Parent-infant interaction

A number of studies have examined the association between maternal representations in pregnancy using the interview and self-report tools referred to above, and parent-infant interaction postnatally. A range of standardised measures were used to assess the quality of such interaction (e.g. Emotional Availability Scale; AMBIANCE; Munich Communication Diagnostic Scale; Still Face). Some of the samples included in these studies were high-risk in the sense of including women who had been exposed to intimate partner violence (Theran et al., 2005), who were drug-using (Flykt et al., 2012), or at depressive, psychosocial or cumulative risk (Tambelli et al., 2014).

The results of this diverse set of studies suggest that there is a strong association between representations in pregnancy and parent-infant interaction postnatally. For example, the findings of the two studies that used the WMCI (Theran et al., 2005) or WMCI-D (Crawford et al., 2009) suggest that while 'Balanced' representations are associated with more optimal interaction, a 'Disengaged' classification (indicative of affective or emotional deactivation in pregnancy) is on the whole associated with more controlling interactions; while a 'Distorted' classification (indicative of affective or emotional over-activation) is associated with more hostile interactions; and unresolved trauma as indicated by a 'Disrupted' classification is associated with frightened and frightening interactions with the infant.

PATHWAYS – THE INTERGENERATIONAL TRANSMISSION OF ATTACHMENT

The above research suggests that the mother's emotional/cognitive relationship with the baby in pregnancy is associated with both parent-infant interaction in the postnatal period, and with attachment, with more optimal ratings of the relationship in pregnancy being associated with better interaction and more secure attachment.

Possibly one of the most significant factors

affecting the mother's relationship with the baby in pregnancy is the mother's own attachment status, and a number of studies have measured maternal representations of the mother's attachment (i.e. her Internal Working Models) using the Adult Attachment Inventory (AAI) and its association with infant attachment in the postnatal period (e.g. Madigan et al., 2015; Shah et al., 2010; Fonagy, Steele & Steele, 1991). The results show a strong association between maternal attachment and infant attachment at 12 months (ibid). For example, one study showed that 75% of the time, the mother's attachment predicted infant attachment at 1 year (Fonagy, Steele & Steele, 1991). This phenomenon is known as the 'intergenerational transmission of attachment, and the research presented suggests that maternal representations in pregnancy may play a significant role in this intergenerational transmission process.

Perhaps most importantly, a recent study (Madigan et al., 2015), found that it is maternal representations in pregnancy that mediate the mother and the infant's attachment. So, this study, found that there was a high level of correspondence between mothers' Adult Attachment Inventory (AAI) and infant attachment security at 12 months (i.e. mothers who were insecure had insecure infants), and that this result was accounted for by the mother's prenatal representations about the baby. This means that the mother's attachment status influences her prenatal representations, which influence her caregiving, and thereby the baby's attachment status.

Implications for Practice

This research has a number of important implications for practice. First, it points to the potential importance of assessing the parental relationship with the unborn baby in the third trimester of pregnancy, with the aim of identifying and intervening with those women who are struggling to feel a strong sense of bonding with the baby. This could involve simple questions to the mother or father-to-be about how she or he is feeling about the baby, or through the use of some of the simple screening questionnaires that have been referred to earlier, or new measures such as the prenatal Parental Reflective Functioning Questionnaire (P-RFQ: Pajulo et al., 2015), which is a brief (i.e. 14 items), self-report tool. All of these tools could be implemented by universal health care practitioners such as midwives, health visitors, and public health nurses, as part of the Antenatal Promotional Interview at 28 weeks, or at other opportunities.

These findings also point to the need to develop and evaluate brief methods of supporting women who present with problems. This could range from the use of simple public health type approaches that involve sharing information with pregnant women about the importance of the developing relationship with the unborn baby (see for example the website – Getting to Know Your Baby - http://www.your-baby.org.uk), to the use of more intensive methods of working with women who have very significant problems in terms of this relationship and may be presenting with mental health problems and/or substance dependency. In these circumstances, mentalisation-based programmes such as Minding the Baby (Sadler et al., 2013), that begin in pregnancy and continue into the postnatal period, may be needed.

KEY PRACTITIONER POINTS

- Pregnancy is an important period in terms of the developing relationship between the parent and baby, although most of the research to date focuses on the mother-baby relationship;
- This relationship is measured using tools that assess the parent's feelings or thoughts about the baby;
- There is a significant association between the relationship that is developed in pregnancy with both parent-infant interaction and infant attachment postnatally;
- The relationship with the developing baby should be assessed in pregnancy to identify women in need of additional support.

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