

**Exploring the salience of anger for new mothers, their partners, and their young
offspring**

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of the requirement for the degree of
DOCTOR OF PHILOSOPHY

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DECLARATION

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DEDICATION

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SUMMARY

The corpus of research contained within this thesis concerns the presence and prediction of mothers' and fathers' anger over the transition to parenthood, and their associations with anger manifested in their offspring as infants and toddlers. These topics were addressed in the context of a prospective longitudinal study of first-time parents and their infants in Wales, the Cardiff Child Development Study (CCDS). Attention was first paid to mothers' experience of anger during their pregnancies and the postnatal period, detailing predictors of anger and the modest increase in anger across time (Chapter 3). Secondly, the significance of anger in the context of antenatal and postnatal depression was established (Chapter 4). Mothers and mothers-to-be who had experienced a depressive episode described greater frequencies of anger than mothers who were well, with levels of anger in pregnancy also predicting the onset of postpartum depression. Thirdly, the investigation into anger was extended to include fathers and the parental relationship, revealing that women reported more anger than men at both time points. Again, a modest increase in anger expressed within the relationship across the transition to parenthood was found, and a number of variables of interest were established in the prediction postpartum interparental anger (Chapter 5). In the final empirical chapter, the relevance of parents' anger before entering parenthood and their expression of anger in the home were considered as predictors of anger in their offspring as infants and toddlers. By toddlerhood, clear associations between the generations were noted, with interparental anger established as the most salient predictor of toddler anger in this sample (Chapter 6). Together, these findings suggest anger is a salient emotion across the transition to parenthood, both for parents and their offspring.

CHAPTER 1.

INTRODUCTION

1.1 Aims of the Thesis

There are two overarching themes to this thesis. Firstly, I aim to investigate the experience of anger in first-time parents over the transition to parenthood, exploring how psychological and situational aspects may predict levels of maternal anger, maternal depression and interparental anger in the postpartum months specifically. The second aim of the thesis is to explore the relevance of maternal anger in the prediction of infant and toddler anger. Both aims will be addressed in the context of a prospective longitudinal study of first-time parents and their infants in Wales, the Cardiff Child Development Study (CCDS).

1.2 The Importance of Studying Anger

Research exploring the transition to parenthood has rarely considered the emotion of anger. Studies of perinatal depression and anxiety are more common, and there is some attention focussed on marital conflict and satisfaction over the transition to parenthood. Indeed, the potential salience of anger as an experienced emotion across this transition is seldom recognised. Likewise, research concerning anger as a developing emotion in the early years is far from thorough, with anger often considered within other developing behaviours.

Research charting the prediction of child outcomes has largely concentrated on the prediction of aggression and violence across the life span, with anger subsumed within those factors, rather than concentrating on the emotion of anger in its own right. To this end, this thesis aims to explore anger in two overarching themes: (1) the nature of anger over the transition to parenthood for first-time parents, and (2) the association between parental anger and infant and toddler anger.

The transition to parenthood is widely considered to be a challenging process, within which significant cognitive, emotional, and social restructuring occurs (Breen, 1975). It has often been referred to as a point of crisis (LeMasters, 1957; Dyer, 1963), although not all agree with the severity of this description (Palkovitz & Sussman, 2002). However, it is agreed that the transition to parenthood presents challenges that parents must cope with, and a successful adaptation to the addition of a child to the family requires both assimilation and accommodation—the incorporation of new information and the adjustment to it. At the very least, the transition to parenthood is a process of change, and the addition of a baby to an individual’s lifestyle is likely to be one of the most significant changes a person can face, even when it is a positive and expected experience (Cowan & Cowan, 1995; Osofsky & Osofsky, 1984). A new baby places demands upon parents that uproot previous lifestyles, particularly for women (or the main caregiver). Changes in sleep patterns, work patterns, and the physical pain from delivery are just a few of the stressors that can and often do occur. Psychiatric illness is not uncommon in the postpartum period, and postpartum depression is one of the most commonly studied with respect to its causes and consequences. Depressive symptoms and diagnoses are also at least as common during pregnancy (Bennett, Einarson, Taddio, Koren, & Einarson, 2004; Evans, Heron, Francomb, Oke, & Golding, 2001), suggesting the transition to parenthood is a particularly salient time point in which to study wellbeing. For intact couples, the parental relationship is also affected by the birth of a child,

and such changes are known to manifest a decrease in relationship satisfaction or an increase in interparental conflict (e.g., Belsky & Rovine, 1990). In essence, the entrance into parenthood places significant demands upon many aspects of life, both on a practical and psychological level. Although the word ‘crisis’ may present an overestimation of the effects of the entry into parenthood for many, for some families there is a measurable impact that can be negative and unpleasant.

Men and women will enter parenthood with certain predispositions and expectations that likely affect their adaptation to parenthood. The transition is a dynamic and complex process, with many factors influencing its quality and success. The individual’s emotional style, expectations, attribution biases, and mental health history are likely determinants. Likewise, situational influences will undoubtedly play a role in predicting an individual’s coping to new parenthood, such as their age, educational attainment, social class, whether the pregnancy is planned or unexpected, the quality of the parental relationship, or the social support available to them.

This thesis considers, primarily, the experience of anger across the transition to parenthood. The emotion of anger may be a particularly relevant emotion to observe over the transition to parenthood as anger may be associated with a number of topics that are already under wider attention in the literature into parenthood. Firstly, attention is paid to the course of maternally reported anger between pregnancy and six months postpartum. The strains that accompany parenthood may lead to feelings of anger, such as sleep disturbances, conflict between partners, and uncomfortable changes to lifestyle (Pearlin & Turner, 1987).

Perinatal depression, the most widely studied perinatal psychiatric illness, may also be associated with anger during the transition period. Outside the realm of parenthood, anger has found to be heightened in individuals with depression both at the time of an episode when

compared to non-depressed individuals (Goldman & Haaga, 1995; Riley, Treiber, & Woods, 1989; Sperberg & Stabb, 1998; Thomas, 1989) and in those who have subsequently recovered as compared to those who were never depressed (Brody, Haaga, Kirk, & Solomon, 1999; Ingram, Trenary, Odom, Berry, & Nelson, 2007). In the postpartum period, mothers with depression report that feelings of anger can fill their day to day interactions (Beck, 1996).

Given that anger is a social emotion, its expression may well be triggered and manifested within the parental relationship. Indeed, research has shown an increase in conflict between parents when comparing across the transition (Belsky & Kelly, 1994). Conflict that is affectively charged can be the most destructive to relationships (Cummings, Ballard, El Sheikh, & Lake, 1991). Furthermore, such conflict influences the development of externalizing behaviours most significantly when compared to other types of conflict (Cummings, Kouros, & Papp, 2007). Thus, consideration for the course of interparental anger across the transition the parenthood may be a particularly pertinent topic for both parents and their children.

In light of these three areas, this thesis will firstly concentrate on charting the expression of anger in mothers across the transition to parenthood, whilst considering whether frequencies of anger previous to the birth of the first child predict the course of anger between pregnancy and the postpartum period. Secondly, the association between maternal anger and perinatal depression will be considered; namely, whether mothers with perinatal depression have heightened anger, and whether mothers with heightened anger in pregnancy have a higher risk of postpartum depression. Thirdly, the frequency of anger expressed between parents will be considered. Together, these three topics each reveal whether anger is indeed a salient emotion for new parents.

Charting the course of anger in new parents is a significant endeavour when considering its effects on parental wellbeing alone. However, the presence of anger in the home may also be salient for the emotional development of their infants. The process of socialising emotion in children begins from an early age. Indeed, infants as young as three-months old respond differentially to anger and other emotions in their mothers (Haviland & Lelwica, 1987), and five-month olds are able to respond differentially to vocalizations of negative emotion, even in unfamiliar languages (Fernald, 1993). Parents socialize their children's anger by regulating, or not regulating, their exposure to anger in the home. Indeed, increased exposure to adults' anger may sensitize children to the emotion of anger, thereby lowering their threshold to express anger (Cummings, 1994).

Anger is a central component of antisocial behaviour (Lemerise & Dodge, 1993), with affective biases such as a readiness to anger sitting at the core of psychopathologies such as antisocial behaviour, conduct disorder and oppositional defiant disorder (Jenkins & Oatley, 2000; Malatesta & Wilson, 1988). Furthermore, research shows that some behaviours that resemble symptoms of conduct disorder, antisocial behaviour, and ODD can be charted from the preschool years. Excessive anger at two years of age predicts an increased risk for psychopathology at age 5 (Radke-Yarrow & Kochanska, 1990). Indeed, those children with early onset antisocial behaviours are more likely to have poor social, academic and health outcomes later in life (Brame, Nagin, & Tremblay, 2001; Loeber & Stouthamer-Loeber, 1998) than those who develop such symptoms later in adolescence. Predicting anger in the infant and toddler years may offer further insight into the prediction of these problem behaviours from a time point where behaviour is just beginning to develop and is perhaps at its most malleable to the surrounding environment. Furthermore, few studies isolate anger proneness in children from negative emotionality or general irritability.

Thus, this thesis will also consider the prediction of levels of reported anger in infants and toddlers from maternal anger and the frequency of anger expressed between parents in the postpartum period. In exploring the associations between anger in parents and their young offspring, the salience of anger for the developing child in these formative years can be explored.

1.3 Defining Anger

Although anger has been studied by many across a variety of contexts, is considered to be a basic and primary emotion, and on the surface appears simple to conceptualise, remarkably, the working definitions across the literature have differed substantially. Indeed, comparisons across studies of anger are made complex due to their varying choice of operational definitions (Siegel, 1986). The issues that complicate the definition of anger span both the adult and child literature. Thus, it is essential to note the differences between previous research studies and reviews with respect to the conceptualisation of anger, and to set forth a definition for the purpose of this thesis.

An emotion is a felt state of short duration, associated with distinctive physiological sensations, behaviours, facial expressions, and vocal expressions. Sensations that accompany the emotion of anger include increased heart rate, quickened breath and increased temperature. According to Darwin (1872), behaviours that signal anger may include those that communicate defiance, such as stiffness in the arms, clenched fists and feet that are planted firmly on the ground. Physical changes that create a perceived expansion of size, such as an expanded chest, may also occur. Darwin posits that a frown in the brow is “almost always” present, whilst the wings of the nostrils may be flared. Vocally, an angry tone of voice is typically faster and/or louder, or can be classed as shouting. Depending on the

intensity of the emotion, anger can also manifest as speech that is under the breath or of lowered tone.

Anger is commonly thought to be caused by the blocking of a desired goal. The goal may be directly observable and measurable, or more abstract. Some posit that cognitive and perceptual distortions and deficiencies cause anger (Kassinove, 1995), whilst others suggest perceived wrongs (Potegal & Stemmler, 2010), or threats to autonomy, authority or reputation, are at its root. A violation of rules or norms may induce anger or perhaps a sense of injustice on someone else's behalf (Bies & Tripp, 1996). Essentially, anger may occur when there is a mismatch between what is expected and what occurs.

Particular emotions are often thought to be the product of particular appraisals. When an individual evaluates that an event is relevant to their meeting a certain goal, or not meeting it, emotion can occur. Negative emotions occur when that goal is impeded in some way, whilst a positive emotion would result from the meeting of the goal. For example, a toddler may wish to play with a particular toy (the goal), but the toy is out of reach. When this positive event is prevented, anger may occur. Indeed, its adaptive function in this example would be to promote action in the toddler to reach for the toy, or to communicate convincingly to a parent that the toy is wanted, and mobilize the required action in the parent or caregiver.

When a positive event is desired but not gained, sadness can also occur. Edmund Rolls (1999) presents a clear description of how sadness and anger may be similar by conceptualising emotion as a consequence of certain reinforcement contingencies (see Figure 1). Both anger and sadness result from the omission or termination of a positive event or reinforcer. When the positive reinforcer is deemed unavailable, and no action is possible, or such action is passive, sadness may occur. Conversely, anger instils motivation; when the

positive reinforcer is deemed available, and some action will allow the desired to be obtained, anger motivates such action. Presumably, the determinants of anger and sadness, or approach and withdrawal, may be situational (whether or not action is feasible or possible) and/or internally driven (by learnt behaviour or predispositions to certain appraisals and biases). Furthermore, anger and sadness can blend and are often referred to as distress (Potegal & Qui, 2010).

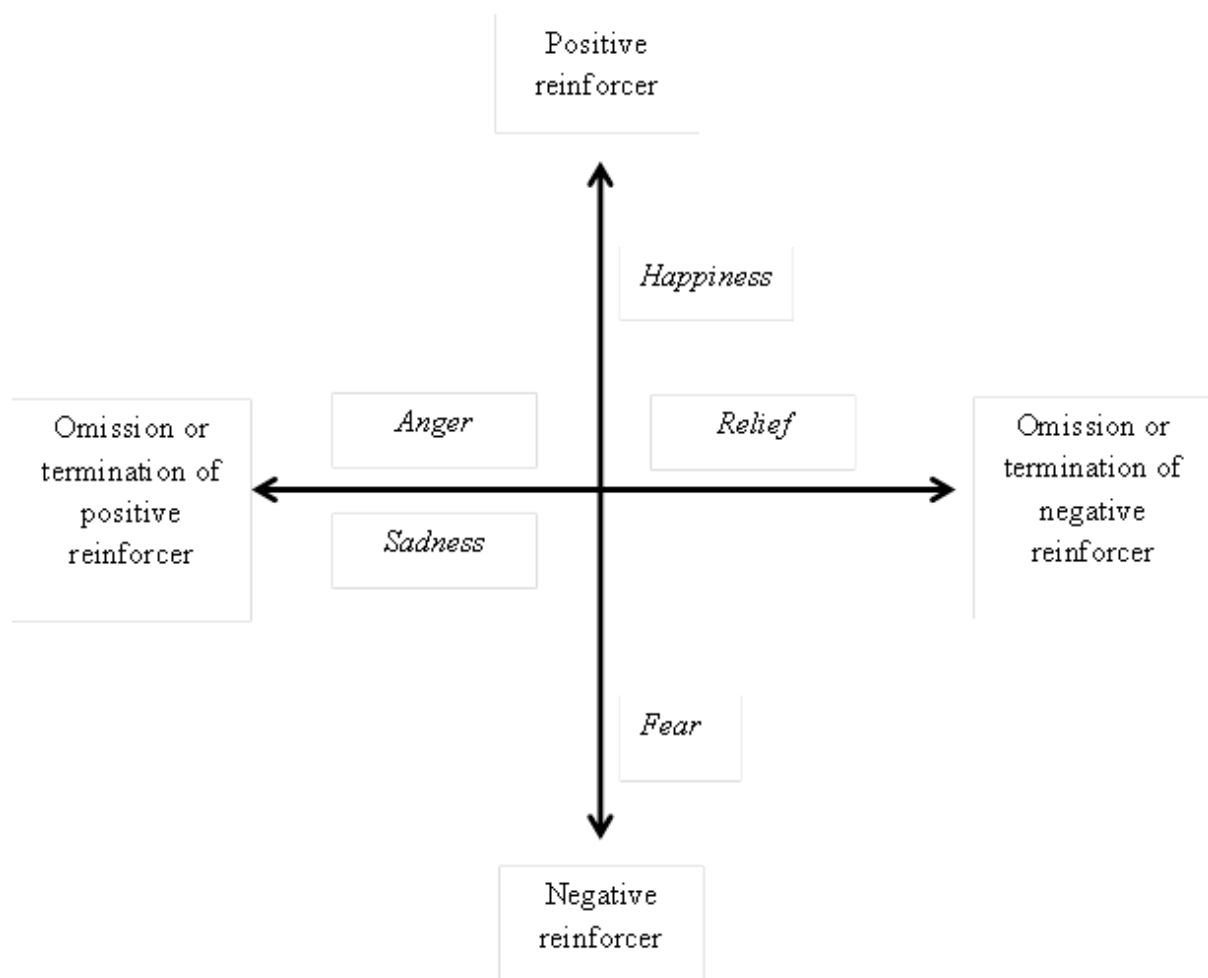


Figure 1.1. Emotions classified by reinforcer contingency. Adapted from Rolls (1999), p. 63.

The intensity of anger is thought to range from irritation or annoyance to fury and rage (Lazarus, 1991; 1994) although some argue that rage should be classed as a separate emotion (Lewis, 2010). The intensity of anger may be rooted in many factors, such as an individual's predisposition to anger, the 'distance' between the expected goal the reality the individual is faced with, age, power, blame, context, impulsivity, and attribution biases.

Anger is often subsumed within definitions of aggression, hostility, and irritability (see Figure 1.2). Anger is, at the very least, highly related to these concepts. However, the conceptualisation of anger, a transient and primary emotion, differs considerably from each. Whilst anger is a primary emotion, aggression is a measurable behaviour. Often defined within the developmental literature as an action made with intent to harm, aggression has a different quality than anger. Aggression is often caused by anger, but not always. Likewise, anger can lead to aggression, but more often does not.

The concept of hostility is often applied interchangeably with anger. Hostility is not an emotion; people do not often describe themselves as 'feeling hostile'. Rather, hostility is a characteristic that is best described as a state or tendency to make negative attributions, to assume the need to defend oneself from threat, or to store ill feelings. Anger, on the other hand, is a more transient experience. In that sense, a hostile individual may be more prone to anger, as anger can result from a negative attribution, a response to threat, or occur following frustration or rumination. A person who is prone to hostility may be more likely to express anger, but both constructs are temporally and qualitatively different.

Like hostility, irritability is a tendency rather than an emotion which may predispose one to anger. Defined by Snaith, Constantoplous, Jardine and McGuffin (1978) irritability is a 'temporary psychological state characterised by impatience, intolerance and poorly controlled anger... expressed outwardly towards each other or directed inwardly towards oneself.' An individual with high irritability could be described as petulant, easily aroused to negativity, or

fussy. It could be considered as a threshold for negative emotional arousal, with anger one potential consequence of such arousal. Whilst an irritable individual may be more prone to anger, anger is most certainly possible in a less irritable person.

Emotions are a distinctly important factor in human behaviour in the social world; how we feel guides how others feel, and vice versa. Crucially, how we feel guides how we act, making emotion perhaps the primary motivational system in human behaviour. In fact, emotions are both adaptive and critical to an individuals' functioning in the social world. This conceptualisation extends to anger. The American Psychological Association (2009) defines anger as a healthy emotion that has the capacity to become destructive when out of control. This view echoes that of Aristotle in his work *Nicomachean Ethics* (Aristotle, 1953), in which he states:

‘Anyone can get angry – that is easy. But to do this to the right person, to the right extent, at the right time, with the right motive, and in the right way, that is not for everyone nor is it easy; wherefore goodness is both rare and laudable and noble.’

Anger serves to enhance motivation (Darwin, 1872), and the outcome of such motivation can be positive. It can increase courage and self-assertion (Izard, 1977) and can be energizing and optimism-mobilizing (Litvak, Lerner, Tiedens, & Shork, 2010). When anger serves to correct the perceived wrong, and does so successfully, that too is a positive outcome (Averill, 1993). Indeed, Averill (1982) claims that the outcomes of angry episodes are more often positive than not. Anger can promote a problem-solving strategy (Lewis, 2010); it can instantly mobilize, creating time-saving efficiency in bypassing deliberation and rumination (Fessler, 2010), directing an individual straight to action. Indeed, Harmon-Jones et al., (2010) suggest that the same neural circuitry is involved in the arousal of anger and in general goal-directed actions, suggesting the function of anger may be to motivate action. In these examples, if

using Aristotle's thesis as a framework, anger can be positive when it is directed correctly, not unnecessarily intense, in the right context, with the correct intention, and is justified.

The majority of researchers, however, concentrate on the risk that anger can convey. Indeed, as Aristotle posited, a positive consequence of anger is rare. We mostly consider anger to be a negative and uncomfortable emotion, both to witness and experience in ourselves. Anger can lead to aggression, can cloud judgement and cognition and lead to unwanted action, and can be repellent to others. Furthermore, its repeated expression and suppression is associated with the development of cardiovascular disease (Smith, Glazer, Ruiz & Gallo, 2004). Despite these negative associations, when studying anger, it may be relevant to note that the consequence of anger may not always be negative, and the emotion itself may be justified. Indeed, healthy infants and adults will experience and express anger. Rather, it is the frequency of such expression that is of primary concern.

Given the conceptual issues introduced above, defining anger in a clear way is a crucial task to fulfil before embarking on its study. With the issues above in mind, this thesis will concentrate on the measurement and prediction of anger specifically, purposefully avoiding the measurement of hostility, irritability, and aggression. Anger is studied under the premise that it is an emotional response to a blocked goal that results from a conflict of sorts, serves to motivate, but can be and often is negative. However, it is also a common emotion and can be a natural reaction to challenges, obstacles and interfered plans. With the knowledge that the birth of the first child is one of the most challenging events in ones' life, anger is expected to occur alongside the transition to parenthood. Likewise, infants' and toddlers' anger can occur in response to the barriers and obstacles that face them daily.

In this thesis, I concentrate on anger that is observable and expressed outward, rather than on suppressed anger, or 'anger-in'. Measuring anger that is visible has a number of advantages. Firstly, anger that is expressed may be the most relevant to the developing infant.

Although suppressed anger may affect a mother's behaviour indirectly, the effect of observable expressions of anger is likely to be most salient to the infant in the first instance. Secondly, expressed anger is measureable by an observer, albeit an investigator, partner or parent. In order to maintain reliability in the measures of anger used in this thesis, behaviours that are observable are pivotal to create useable operational definitions. A self-rating of suppressed anger may be more difficult to quantify and validate. Thirdly, although suppressed or unexpressed anger is undoubtedly related to expressed anger, the two types may be associated with different outcomes. Whilst suppressed anger is undoubtedly an interesting topic, deserving of attention across the transition to parenthood and as a predictor of child outcome, it is beyond the scope of this thesis. For these reasons, this thesis is concerned with anger that is visible, measurable, and outwardly expressed.

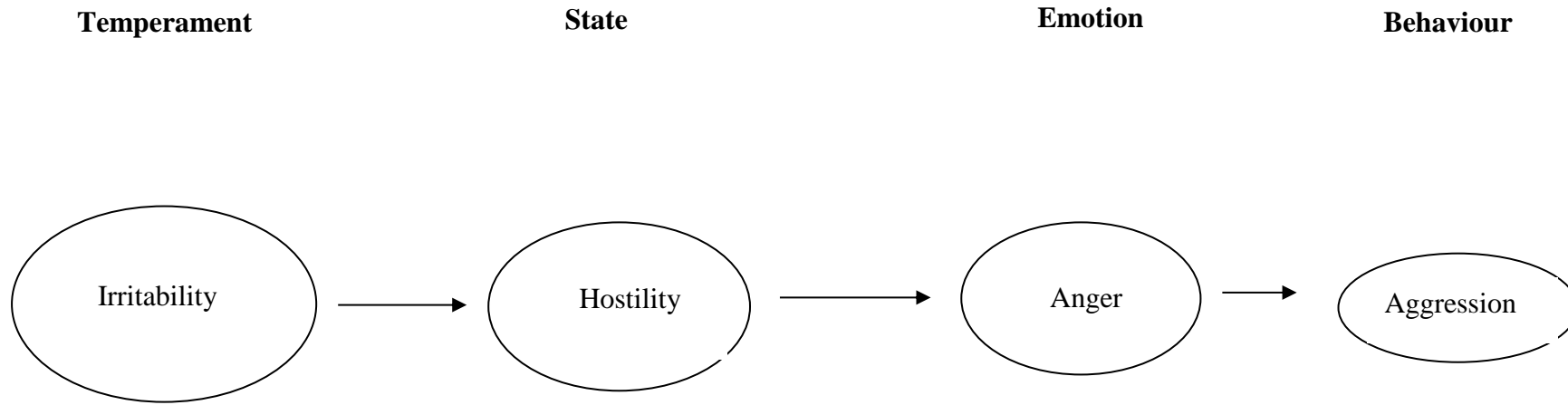


Figure 1.2. Conceptualising irritability, hostility, anger and aggression.

1.4 Glossary of Terms Used in the Thesis

Consistency and clarity in defining constructs is a necessity in successful psychological research and is particularly lacking in the literature on anger. The list below serves as a glossary for the terms related to anger that are referred to, and created in, this thesis. The precise structure of novel constructs will be described in their appropriate empirical chapters.

1.2.3.1. Maternal and paternal pre-childbirth anger. This variable is a composite measure of the frequency with which the individual expressed anger over time. Measured both contemporaneously and retrospectively, it is summary variable of the frequency of anger reported at various points in life (childhood, adulthood, and during pregnancy) prior to the birth of the first child. It is simply a descriptive measure of an individual's frequency of expressed anger over time. This measure was used to capture both mothers' and fathers' tendencies to anger before the birth of the child. Analyses regarding the structure of this construct are presented in Chapter 3 in the case of mothers and Chapter 5 for fathers.

1.2.3.3. Contemporaneously measured mothers' anger during pregnancy and postpartum. In Chapters 3 and 4, identical measures of anger taken at two contemporaneous time points (pregnancy and six months postpartum) will be considered. These measures each represent a time-limited frequency of anger expression, incorporating loss of temper, rage and loss of control. These two measures are used in analyses when the timing of the anger is of importance.

1.2.3.3. Interparental anger. Interparental anger refers to anger displayed by both parents in the context of their relationship. Both mothers and fathers provide a rating of their own anger directed at their partner (self-rating of interparental anger), whilst also rating their partner's anger directed at them (the other-rating). The interparental anger measures are

concerned with *observable* expressions of anger that are expressed to and witnessed by each partner. The properties and construction of this measure are presented in Chapter 5. Mothers' and fathers' expressions of interparental anger are analysed separately for each partner when differences in gender are of consideration, but combined to create a joint interparental anger score when used in Chapter 6 to predict infant outcome.

1.2.3.4. Infant and toddler anger. These measures assess the informant-rated expression of anger by the child in infancy and toddlerhood. The child's expression of anger is rated by mothers, fathers and a third person who knows the child well, such as a family friend, child-minder or grandparent. The measures of child anger are taken from the Cardiff Infant Contentiousness Scale (CICS; Hay, Perra, et al., 2010). The CICS comprises a set of items measuring infants' use of physical force against people and displays of anger (*angry moods, temper tantrums, hits and bites*). The items of anger and aggression are subsumed within a list of age appropriate developmental milestones, such as "*is able to drink from a cup*", with the aim to reduce social desirability bias. The CICS scale has been validated by its association with experimenter-observed infant expressions of anger and physical aggression. For the purpose of this thesis, only those items measuring anger ('angry moods' and 'temper tantrums') were used to measure the child's expression of anger. Although consisting of a brief two items, the validity of the resulting measure was demonstrated by its association with the child's observed behaviour. The details of this analysis are contained within Chapter 6.

1.5 Structure of the Thesis

Chapter 2 provides a general overview of the methods used in the Cardiff Child Development Study, the dataset used to investigate all research questions contained in this thesis. The remaining chapters of the thesis reflect its two overarching themes. Firstly, I aim to investigate the experience of anger in first-time parents over the transition to parenthood.

Chapter 3 details the change in women's anger between pregnancy and six months postpartum. Chapter 4 considers the association between women's anger and their experience of antenatal and postpartum depression. The aim in Chapter 5 is to document the course of interparental anger, that is, anger expressed by both mother and father within their relationship, across the same life transition. Chapter 6 addresses the second overarching aim of the thesis, the prediction of anger in infancy and toddlerhood. Within this chapter, the contribution of each element discussed in Chapters 3 to 5 to the prediction of infant anger will be assessed. Chapter 7 provides a general discussion of the findings, detailing the strengths and limitations of the research, the implications of the findings, and ideas for further research concerning anger in parents and children.

CHAPTER 2.

THE CARDIFF CHILD DEVELOPMENT STUDY SAMPLE AND PROCEDURE

2.1 Aims of the Chapter

This chapter outlines the methodology of the Cardiff Child Development Study (CCDS) as a whole, describing the subsamples used in each chapter, and the procedures used throughout the thesis.

2.2 General Method

2.2.1 Design

The CCDS is a longitudinal project investigating the early prediction of aggression and prosocial behaviour in infancy and early childhood, with specific interests in the biological, cognitive and social risk factors for children's emotional and behavioural problems. The CCDS follows families from pregnancy through to three years, over five time points. All families entered the study as expectant first-time parents. The project is funded by the Medical Research Council, whilst all procedures were approved by the Cardiff University School of Psychology Research Ethics Committee and the NHS Multi-Centre Research Ethics Committee.

2.2.2 Participants

2.2.2.1. Recruitment. Three-hundred and thirty two primiparous women were recruited between 1st November 2005 to 31st July 2007 from antenatal clinics in hospitals and general practice clinics in South Wales, UK. To increase the representativeness of the sample, midwifery teams also allowed researcher access to antenatal clinics for specialist medical problems, and to outreach services for vulnerably housed individuals. The majority of the recruitment took place within hospitals as GP surgeries tended to serve multiparous women rather than first-time parents.

Expectant mothers and their accompanying family members were approached by researchers in the hospital or clinics, whilst receptionists gave guidance as to who may be expecting their first child and was therefore suitable for the study. Families were given a brief explanation as to the nature of the CCDS and what their enrolment would entail. A DVD was available to show those families who showed an interest in the study, and a leaflet with further details was provided for them to take home. If the families expressed an interest they were asked to provide contact details so that an administrator could contact them one or two weeks later. During this follow-up call, the administrator arranged an appointment with those families who had decided to take part in the CCDS. This appointment was made for the third trimester of pregnancy and became wave 1 of the CCDS.

2.2.2.2. Construction of subsamples. Due to the differing nature of the research questions at each chapter of this thesis, the samples used to test the hypotheses differ between chapters. For example, because Chapters 3 and 4 concern the salience of anger in new mothers over the transition to parenthood, data regarding anger at both time points was necessary. In the remaining two empirical chapters, anger between partners is added as a further focus; therefore only intact parental relationships were appropriate for analysis. Therefore, the samples used in different chapters in this thesis differ in demographic

characteristics. The caveats resulting from this change in sample size and demographic characteristics are highlighted in the general discussion. Rationales for the choice of participants for each subsample are provided in the chapters that follow and are highlighted in Figure 2.1.

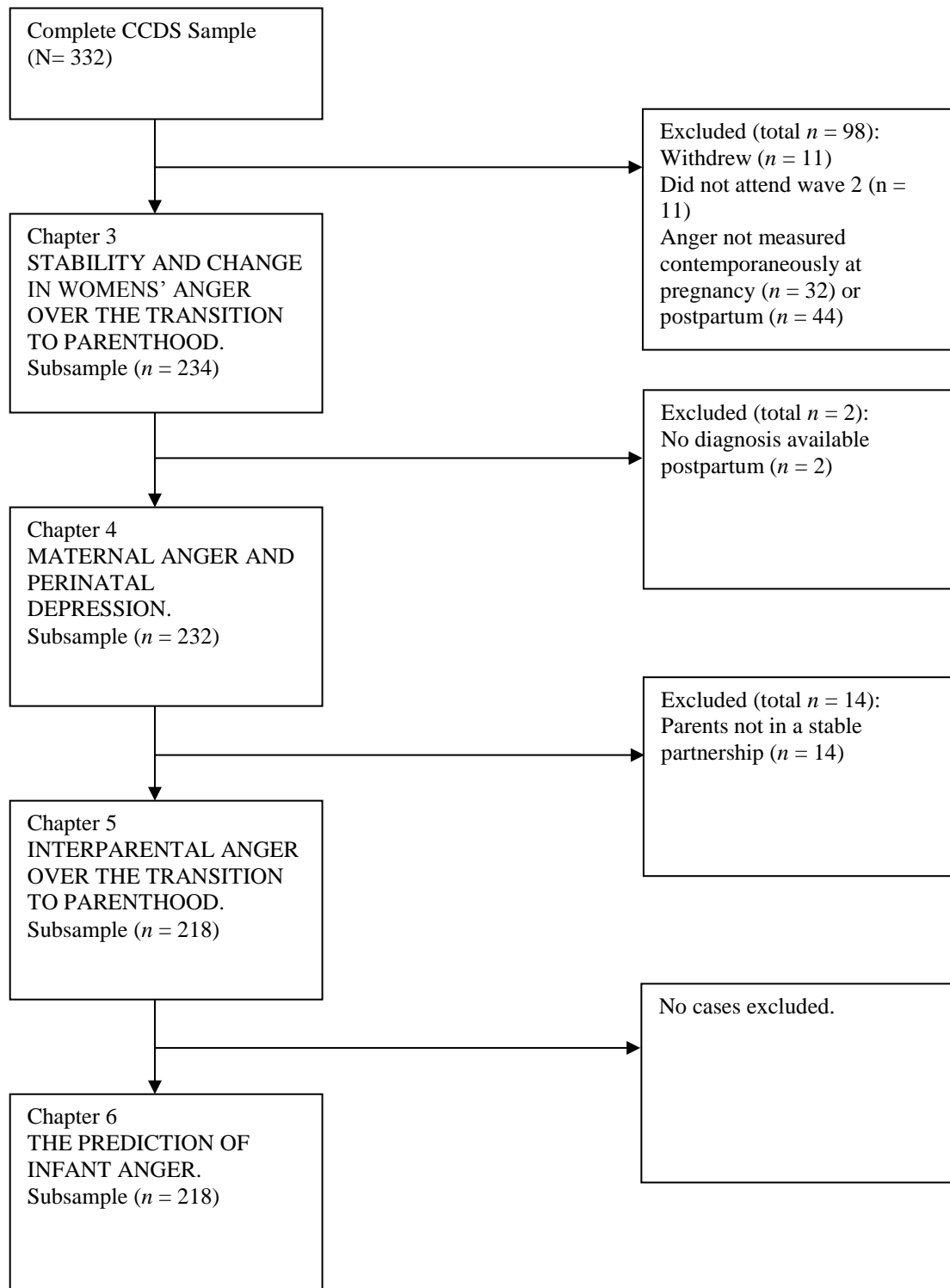


Figure 2.1 Subsamples included in each empirical chapter in the thesis.

2.2.2.2. Demographic Characteristics. The necessary demographic characteristics for each family were provided by questionnaire or interview at the antenatal assessment, with the exception of maternal and paternal age of first birth which was calculated from the infant's date of birth. Age, ethnicity and marital status are self-explanatory. Educational achievement was dichotomised according to the basic expected achievement by individuals in the UK. To achieve basic qualifications, individuals must gain 5 or more G.C.S.E.s, usually at age 16. Education was therefore dichotomised to fewer than basic educational qualifications (fewer than 5 G.C.S.E.s) or basic or more (5 or more G.C.S.E.s). Social class was derived according to the Standard Occupational Classification 2000 (SOC 2000; Elias, McKnight & Kinshott, 1999), based on mothers' and fathers' highest scoring occupation of the past or present. Middle class was defined as an occupation of (1) manager or senior official, (2) professional or (3) associate professional or technical position. Working class was defined as an occupation considered (4) administration or secretarial, (5) skilled trade, (6) personal service, (7) sales or customer service, (8) process, plant or machine operative, or (9) elementary occupations.

The 332 families that comprise the CCDS sample were representative of the UK average in all demographic factors. There were no significant statistical differences between the two main samples that comprise this thesis (234 and 218 respectively); however, in comparison with the full CCDS sample there are some pertinent differences. When comparing the 332 and 234 mothers who completed the necessary contemporaneous questionnaire measures of anger across pregnancy and the postpartum period, mothers in the subsample were slightly older and significantly better educated. Mothers were also more likely to be in a stable partnership with the father of the child. Specifically, more were married. They were also significantly more likely to be from a middle class background.

Table 2.1

Demographic Characteristics of the Full CCDS Sample and the Subsamples Contained within this Thesis.

Variable	The nationally representative full CCDS sample <i>N</i> = 332	Chapters 3 & 4: Maternal anger and perinatal depression <i>N</i> = 234	Chapters 5 & 6: Interparental anger and infant/toddler anger <i>N</i> = 218
Mother's age at birth (mean)	28.15	29.60	30.04
Stable partnerships (% stable)	90.3%	94.0%	100%
Marital status (% married)	50.3%	59.8%	64.2%
Ethnicity (% British or Irish)	92.7%	93.0%	93.6%
Social Class (% middle class)	50.9%	60.3%	63.3%
Mother's Education (% ≥ basic qualifications)	79.3%	84.0%	86.7%
Child sex (% female)	42.8%	44.4%	45.0%

2.2.3 Procedure

All study procedures were approved by the Multi-Centre Research Ethics Committee for Wales which serves the NHS. At each of the five waves, a mixture of interview, questionnaire and observational methods were employed. Waves 1, 2 and 4 were conducted at the participants' home, whilst families were invited to the purpose-designed laboratory at the university at Waves 3 and 5. Specific procedural details for each wave will now be explained.

2.2.3.1. Wave 1: Antenatal assessment. Wave 1 appointments were made by the CCDS administrative staff to occur within the third trimester of pregnancy. At the appointment, two research assistant visited the family at home. A complete description of the study was provided, and written informed consent was gained before beginning. Further informed consent was gained for the audio recording of interviews conducted at the visit. Research assistants conducted interviews with mothers and fathers, each in separate rooms. If the biological father was not in a relationship with the mother, attempts were made to interview the father separately where appropriate. The interview included questions regarding psychopathology (current and past problems), any family history of mental health problems, employment, socio-demographic information, and social support. Following completion of the interview, mothers and fathers were asked to complete a packet of questionnaires and return them to the university as soon as possible. A stamp addressed envelope was provided for convenience. These questionnaires provided information on general health, lifestyle, life events, relationship quality, fertility history, behavioural history, and substance use. At the end of the visit, a small remuneration in the form of a £20 gift voucher was provided to the family.

2.2.3.2. Wave 2: The early infancy (six months) assessment. Approximately one month before the time window for Wave 2, a researcher would contact the family by phone,

post, or sometimes in person. One or two researchers visited the families at home at approximately 6 months of age ($M = 6.55$ months, $SD = 0.82$ months). Informed consent was obtained before the interview or observation began. The two-hour assessment consisted of three elements: (1) an interview with the mother, (2) behavioural observation of the infant and mother (or father on occasion), and (3) a questionnaire battery. The interview comprised of the same SCAN interview administered at Wave 1, although the screening system was implemented at Wave 2. Mothers' experience of psychopathology between the time of the last interview and the timing of Wave 2 was investigated. Mothers were also asked about changes in their relationship, education, living environment, together with their experience of labour, obstetric complications, and current social support. Following the interview, a set of tasks were then conducted with the infant and mother (or primary carer), including measures of imitation, reaction to novelty, frustration in response to restraint in a car seat, and parent-infant interaction. These tasks were filmed by the experimenter for later independent observation and coding. Finally, questionnaires for mothers, fathers, and a third informant (a family friend or relative) were given prior to the visit, to be collected on the day. If the families had not yet completed all questionnaires, stamped addressed envelopes were provided for convenience. At the end of the visit, a small remuneration in the form of a £20 gift voucher was provided to the family.

2.2.3.3. Wave 3: The late infancy (twelve months) assessment. At Wave 3, the families were invited to a simulated birthday party at the School of Psychology, Cardiff University. Ideally, three families from the study were invited to the lab for an afternoon. First, individual cognitive assessment with each infant and their accompanying parent(s) or guardian(s) were conducted in separate rooms. The three families were then observed together during a simulated birthday party, featuring a 'teddy bear's picnic' scenario, which entailed a series of socioemotional challenges presented to the infant. The three families were

then asked to remain in the testing room for 20 minutes to allow observation of free play. The accompanying parents/guardians were asked to complete questionnaires whilst at the University. No data from Wave 3 are used in this thesis.

2.2.3.4. Wave 4: The early toddler (20 months) assessment. The early toddler assessment involved a further two-hour visit to the family's home. This visit took place when toddlers were approximately 20 months old ($M = 20.40$ months, $SD = 2.11$ months). A shorter catch up interview began the session, after which a two-task observation of parent-toddler interaction was filmed. For the second hour, parents were asked to invite a friend of the child to their home, to allow the observation of the child's natural play with a familiar peer. A 45-minute session of peer interaction was filmed, followed by a lucky-dip present for each child. Questionnaires were sent at the time of booking, ideally for collection during the visit. If they were not completed, a stamped addressed envelope was provided for convenience. For the purpose of this thesis, a questionnaire-measured rating of toddler anger was used, completed by the mothers, father, and third person who knew the toddler well, such as a grandparent or family friend.

2.2.3.5. Wave 5: The late toddler (35 months) assessment. This assessment took place at approximately thirty-five months of age ($M = 34.94$, $SD = 5.85$ months). The procedure at Wave 5 was identical in design to that at Wave 3; however, the nature of the cognitive tasks in the individual assessments were aimed at the appropriately advanced cognitive level for the older toddler. The 'birthday party' portion of the assessment remained identical to that at Wave 3. For the purpose of this thesis, a questionnaire rating of toddler anger was used, completed by the mother, father and a third person who knew the toddler well, such as a grandparent or family friend. The questionnaire rated toddler anger was averaged between Waves 4 and 5 to include the maximal number of participants in the sample.

CHAPTER 3.
STABILITY AND CHANGE IN WOMEN'S ANGER OVER THE TRANSITION TO
PARENTHOOD

3.1 Introduction

Investigations into the normative presence of anger in mothers are lacking, with the majority of research in this area concentrating on either extreme pathological anger, anger within depression, or anger in the context and prediction of child abuse. Similarly, little is known about the normative experience of anger in women over the transition to motherhood. It has been established that the transition to parenthood can lead to issues such as sleep disturbances, relationship strains, feelings of loss of controllability, economic hardship, child-care difficulties, and loss of resources (Averill, 1983; Ross & Van Willigen, 1996; Wells, Hobfoll, & Lavin, 1999). Subsequently, the strains that accompany parenthood may lead to feelings of anger (Pearlin & Turner, 1987); functioning on a lack of sleep may be frustrating, disagreements about child care may lead to arguments between parents, and changes to lifestyle may not always be wholly welcome (see Chapter 5 for further discussion on this topic). As discussed in the introductory chapter, despite the negative connotations that prevail in past research into anger, the emotion of anger is, in fact, a normative experience

that is not necessarily disruptive, can be potentially adaptive, and does not always precede aggression. In fact, the difficulties and changes that accompany parenthood listed above may promote anger as an adaptive tool to overcoming such challenges (Cohan & Brabury, 1997). It is also been shown that the majority of these challenges place a greater burden on women than men (Belsky & Pensky, 1988) as the former more often fulfil the role of primary caregiver (Bianchi, Robinson, & Milkie, 2006; Bird, 1999; Fuma, 2005).

The first aim of the current chapter is to present a clear case for the study of anger in first-time mothers. Historically, anger was regarded as a 'masculine' emotion, and its expression was considered 'inappropriate' in women (see Frost & Averill, 1982 for review). Assumptions that men experience anger more than women have been made erroneously for two related reasons. As men tend to display more aggression than women (Bettencourt & Miller, 1996) and items pertaining to aggression are often included in measures of anger, the conclusion that men also display more anger has been made due to methodological flaws. Indeed, evidence to the contrary reveals either little difference in anger between genders (Deffenbacher et al., 1996), or higher frequencies of anger in women as compared to men (Frost & Averill, 1982), and indeed mothers have been found to show more anger than fathers (Barry & Kochanska, 2010). Furthermore, and of direct relevance to the current chapter, mothers have been found to show more anger in comparison to women without children (Ross & Van Willigen, 1996), and more anger postpartum when compared to their own levels before birth (Galambos & Krahn, 2008; Graham, Lobel, & DeLuca, 2002). However, thorough investigations into the normative variation and change in anger levels in mothers over the transition to parenthood in representative samples are lacking.

3.1.1 Anger and the Transition to Motherhood

To date, research investigating the effect of motherhood on levels of anger is sparse, inconsistently defined, and presents discordant conclusions. The studies in question are summarised in Table 1, which highlights the fundamental difference in methodology that make comparisons between these studies problematic. When comparing parents with non-parents in a cross-sectional design, Ross and van Willigen (1996) observed mothers and

Table 3.1

Previous Literature Investigating the Course of Anger over the Transition to Parenthood.

Author	Sample characteristics	Parity	N	Change in anger	Variables associated with postpartum anger levels
Ross et al., 1996	Broadly representative of US population. Comparing parents to non-parents. None < age 18.	Multiparous, although number of children accounted for.	2,031	Women's anger increases after birth, moreso with the addition of each new child.	Economic hardship; child-care difficulties.
Galambos & Krahn, 2008	All university graduates, age 19 - 29.	Not accounted for.	577	Increased anger when entering parenthood, especially so for mothers.	Educational attainment
Graham et al., 2002	Mostly white middle to upper class. > age 18. Excluded planned cesarean deliveries.	23% multiparous	163	No increase in anger. However, 43% of women reporting high postpartum anger reported low prepartum anger.	Older mothers, childcare stress, having no religious beliefs.
Wells et al., 1999	Largely well-educated, middle-income, European	57% multiparous	71	Change not tested - postpartum measure only.	Resource loss (objects, employment, optimism, energy).
Behringer et al., 2011	Representative ages and income, but slightly higher education than population.	All but one mother primiparous.	77	No general increase. Only for those mothers secure in their representation of past attachment relationships.	Past secure attachment, childcare problems, shorter relationships, father working less hours.
Monk et al., 1996	At least age 18, stable relationships only, well educated, low risk sample.	First time and experienced parents compared.	37	A decrease in anger for women, and increase in anger for men.	First time fatherhood, decreased time spent alone as a couple.

fathers to have higher levels of anger than non-parents. Similarly, when measuring individual change in anger using longitudinal within-subjects analysis, Galambos and Krahn (2008) found that expressions of anger increased after having a child. Indeed, for both samples the effect was more marked for women than men. In contrast, Graham, Lobel, and DeLuca (2002), did not find an increase in anger when measured between pregnancy and the postpartum period in another study of within-subject change over time. Others, on the contrary, have observed a decrease in anger after birth, followed by an increase to baseline by twelve-months postpartum (Monk et al., 1996). The contrasting outcomes of this research may, in part, be due to inconsistencies in methodology, an issue that is common within the study of anger more generally, and will be described below.

Although the expression of anger varies on a continuum from mild irritation to intense fury (Spielberger, 1999), past research has often failed to appreciate this dynamic nature of anger, and in doing so has referred to all aspects from ‘feeling annoyed’ and ‘screaming’ collectively as ‘anger’. Subsequently, one researcher may define anger differently to the next, whilst both by default claim to measure anger synonymously. Similarly, the validity of the measure may be a further issue; labelling a construct as anger does not necessarily mean it accurately measures anger. Indeed, even minor and subtle changes in the items that comprise the anger measures can lead to considerable differences between findings. Whilst this issue is not always of primary concern, when contrasting and collating the findings between studies one must be sure that the resemblance of the measurement is considered. The research described in Table 1 measures anger in a variety of ways, and the nature of the items comprising each construct of anger differ in both their indication of anger intensity, and the specificity of their definition. For example, Ross and van Willigen (1996) used a 3-item measure of anger (how often in the last seven days have you felt annoyed with things or people, felt angry or yelled at someone), and noted an increase in anger after birth. In

contrast, Behringer, Reiner, and Spangler (2011) employed a measurement of anger taken from the Differential Emotions Scale (Izard, 1977) that asks “in your daily life, how often do you: *feel like screaming at someone or banging on something; feel angry, irritated or annoyed; feel mad at somebody*” and conclude no general increase anger postpartum. By the inclusion of a physical manifestation of anger, the latter measure seems to be measuring a more intense experience of anger, or perhaps even aggression. Given the measures are not identical, a tenuous hypothesis to draw when comparing both studies is that varying intensities of anger follow different courses across the transition to parenthood.

A further concern within the literature on anger is the specificity of the items that comprise its measurement. Whilst some measures employed in the literature described above apply precise definitions of anger, other measures use rather more vague indicators. For example, the Derogatis Affect Balance Scale (Derogatis, 1975) was designed to measure, amongst other factors, hostility. The four items that comprise this construct are: feeling angry, irritable, annoyed, and resentful. However, Graham and colleagues (2002) have re-labelled this scale as anger in their study, adopting the rationale that “face validity suggests that they are appropriate indicators of state anger” (p.226). Although the resulting Cronbach’s alpha score suggests consistency between items ($\alpha = .74$), labelling the scale as a measure of anger may not necessarily be appropriate. Consequently, the conclusion that Graham and colleagues (2002) present – that anger does not increase over the transition to parenthood – is somewhat unsubstantiated in this case. Indeed, as discussed in section 1.3, whilst anger is a primary emotion with its expression is limited to specific points in time (although varying in length and intensity), hostility represents a constant inclination to negative appraisals.

The first consideration in the measurement of anger for the purposes of this chapter, therefore, is to ensure validity in measurement. That is, items comprising a measure of anger

must be anger-specific, whilst analyses should be appreciative of the dynamic nature of anger in terms of its intensity.

A further methodological issue noticeable in the literature presented in Table 1, specific to the measure of anger over the transition to parenthood, is the lack of discrimination between primiparous and multiparous parents. Investigating first-time parents offers a unique opportunity to measure responses to parenthood that are uncontaminated by previous experience. A change in anger may not occur in the same degree, direction, or at all, in individuals who are already practised in overcoming the challenges that accompany the addition of a child to the family. Consequently, first-time parents are a somewhat unique group. The majority of the aforementioned studies used samples with a varied number of - previous children, although there were two exceptions. Behringer and colleagues (2011) chose mothers who were yet to have a child with their current partner, and by chance only one mother (and two fathers) had an older child from a previous relationship. The pattern of results remained identical after excluding these cases. Secondly, although Ross and Van Willigen (1996) did not exclude primiparous parents, they did find that women's anger increased significantly with the addition of each child to the family, a pattern explained by the increased burden of child-care difficulties.

The second methodological decision pertaining to the measurement of anger over the transition to parenthood, therefore, was to limit the sample to first time mothers, for whom measurement is uncontaminated by previous experience.

Consideration for the demographic characteristics when comparing results across research is also an essential task, especially as anger is known to be associated with such variables. Age is known to be associated with anger generally, with higher levels observed in younger adults when measured both by cross-sectional design (Spielberger, 1999) and longitudinally (Galambos & Krahn, 2008). Consideration for the age of participants and the

representativeness of the sample in question are therefore of particular importance in the study of anger. Graham et al. (2002) excluded teenage mothers (and mothers from a working class background), thereby limiting their conclusion of no increase in anger to a low risk sample. It is possible that younger mothers are more likely to respond to parenthood with increased anger due to their increased risk for co-occurring factors, which also relate to anger, such as unstable relationships (Baldwin, 1993) and poorer educational attainment (Hofferth & Moore, 1979). However, this relationship is not a simple one. Graham and colleagues (2002) observed the opposing trend in their sample, with older mothers reporting more anger than younger mothers – a finding not mediated by any other relevant social and demographic variables. Indeed, a further study measuring postpartum anger in mothers aged between 22 and 40 found no association between age and anger (Wells et al., 1999). Certainly, consideration for the association between age and anger by thorough study of representative samples must be made before assuming any conclusions regarding anger over the transition to parenthood.

The third consideration, therefore, is to ensure a representative sample that allows for an appreciation and control of the relevant sociodemographic variables in the study of anger and parenthood.

3.1.2 Stability in Anger over the Life Course

In contrast to some earlier research, the current study examines change in women's anger over the transition to parenthood in the context of their earlier tendencies to express anger. Logic suggests that women who experience greater levels of anger as mothers, and/or experience increased anger after becoming a mother, may score more highly on measures of anger before having a baby. Indeed, in the studies that observed changing levels of anger between pregnancy and the postpartum period, there remains continuity as measured by

correlation (i.e. $r = .46$ in Wells et al., 1999). To date, however, no research has investigated whether women's general propensity to anger may predict who may react to parenthood with anger. Specifically, given the understanding within the literature that there is stability in the frequency of anger expression over time - like a trait, temperament or disposition - it seems highly relevant to consider how an individual's general propensity to anger may factor in her anger response within the specific context of the entrance to parenthood.

Measures of general propensity to anger, like those measuring anger contemporaneously, similarly suffer from flaws in methodology. Perhaps the most widely used measure of anger propensity for research purposes is the State-Trait Anger Expression Inventory (STAXI), constructed by Spielberger and colleagues (i.e. Spielberger et al., 1999). Derived from state-trait personality theory, the STAXI measures two related but distinct constructs, state- and trait-anger. State anger is defined as the momentary and transitory experience of anger, including subjective feelings and physiological arousal, and varies on a continuum from mild irritation to the intense experience of fury. Trait anger, on the other hand, is defined as the stable propensity for an individual to experience state anger over various situations and time points. As such, the self-rated items that comprise each construct differ in their temporal reference, with state-anger items referring to the present (I am angry), and trait-anger items referring to more enduring characteristics (I am a hot-headed person). A critical review of questionnaire measures of anger concluded that the STAXI is one of the strongest measures of anger available to researchers (Eckhardt, Norlander, & Deffenbacher, 2004).

Complete confidence that STAXI-measured Trait Anger is an indicator of one's stable propensity to anger *over time* is questionable. Although a degree of variation in anger over time would be expected, given changes to an individual's environment and their general maturation, finding maintenance in continuity over time should be key evidence in arguing

that a trait exists. Similarly, capturing such continuity is pivotal in ensuring confidence in the validity of the measurement of a characteristic trait. Despite this key aspect to the definition, no studies to date have been conducted to confirm any longitudinal stability or test-retest reliability in Trait Anger beyond two weeks (Bishop & Quah, 1998). Indeed, other measures of anger have shown more successful longitudinal test-retest reliability, such as Buss and Plomin's (1984) Emotionality, Activity and Sociability Scale (EAS). The anger factor within this measure has been shown to be reliably similar between two time points three years apart (Naerde, Roysamb, & Tambs, 2004), displaying a correlation of $r = .71$ in a sample of adult women.

Interestingly, a somewhat unrelated study has so far appeared more fruitful in ensuring stability in anger when measured across a substantial period of time, although its aim was to measure longitudinal change. In a study using brief self-report measures longitudinally across early adulthood (Galambos, Barker, & Krahn, 2006), researchers observed individual consistency in expressed anger at points as far as seven years apart (age 18 – 25; *Mdn* $r = .44$). The investigators asked participants to rate how often in the past month they had '*felt angry, lost your temper, yelled at people, and got into physical fights or arguments*'. At the core of any definition of a temperament, trait, or disposition is an agreement that an individual's score on the dimension of interest will predict their 'behaviour, thoughts and feelings observed across situations and over time' (McAdams & Olson, 2010). To this end, the longitudinal continuity in anger as measured by Galambos and colleagues provides the most compelling evidence for the stability of anger expression across time. However, the inclusion of an item measuring aggression (physical fights) may explain this continuation over time, given that aggression is a stable trait (Hay, Castle, & Davies, 2000; Olweus, 1979). Indeed, an amalgamation of scores on items limited to anger, omitting

those measuring aggression, at different measurement points would provide the most accurate estimation of anger propensity across time.

3.1.3 Aims of the Chapter

The first aim of the current chapter is to examine the pattern in women's experience of anger over the transition to parenthood. For these analyses, comparisons between self-reported anger in pregnancy and the postpartum period will be made to measure change. Attention will be paid to changes in anger at the item level, with a view to determining which specific elements of anger expression, if any, may change in frequency after childbirth. Mothers' own judgements of whether they have experienced more anger after childbirth will also be examined.

The second aim is to examine continuities in women's anger prior to childbirth. To this end, associations between retrospectively measured levels of anger in childhood and contemporaneous measures of anger during pregnancy will be calculated. This will enable the creation of a summary measure of women's pre-childbirth anger, which will be explored as a predictor of the frequency of maternal anger postpartum.

3.2 Method

The analyses in the current chapter are conducted using a sample of mothers participating in the Cardiff Child Development Study (CCDS), the details of which are described in full in Chapter 2. The elements of the study specific to the current chapter are explained below. The analyses are divided into two main sections; (1) the change in anger over the transition to parenthood, and (2) continuities in women's anger prior to childbirth.

3.2.1 Subsample of Participants in Chapter Three

For the initial set of analyses, the study of women's anger over the transition to parenthood, it was fundamental that anger be measured in a contemporaneous fashion at both the antenatal and postnatal assessment. Due to the overall requirements of the CCDS, a contemporaneous measure was not always obtained; a briefer retrospective 'catch-up' questionnaire was completed when participants had initially declined to do their questionnaires, and was administered in a later wave of the study. Of the full sample, 234 provided the necessary data at both waves 1 and 2 for the comparison of contemporaneously measured anger over time; 11 (3%) requested to withdraw from the study between Waves 1 and 2, a further 8 (2%) had moved house after birth and could not be traced in time, and 3 (1%) were unable to take part in Wave 2 due to difficult family circumstances. A further 32 (10%) mothers did not provide a contemporaneous measure of anger during their pregnancy. Of the remaining 278 families retained at wave 2, a further 44 (14%) mothers did not provide data within the time window at Wave 2 necessary to provide a contemporaneous measure of anger at 6 months post-partum. The decision was made to exclude those from the analyses to ensure the appropriately limited time frame of six months postpartum was held as invariable as possible.

The mothers in the current sample of 234 had an average age of 29.56 (SD = 5.68), ranging from 17 to 41 years. Eighty-four percent (196) had at least the basic level of

educational qualifications, 94% (218) were in stable partnerships (defined as either married, cohabiting, or in stable relationships but not living together), 60.3% (141) were considered middle class, and 93% (217) classified themselves as British or Irish.

3.2.2 Procedure

The full details regarding the CCDS procedure are described in Chapter 3; therefore aspects that are salient for only the present Chapter 3 analyses are described below.

3.2.2.1. Antenatal assessment. Following recruitment, mothers were contacted in the latter half of their pregnancy to arrange a home visit. Two researchers visited the families during the third trimester of pregnancy to conduct a two hour long interview. Mothers were then given questionnaires to return to the university in a stamped addressed envelope. The key items used in the current analyses were the retrospective and contemporaneous anger items contained within the questionnaire battery.

3.2.2.2. Postnatal assessment. The first contact with families following the birth of their infants was made approximately one month before the time window for Wave 2 (5-8 months). For this visit, research assistants visited the family at home for two hours. First, the mothers' ratings of her current anger were measured from items embedded in the Adult Wellbeing Scale (Snaith et al., 1978), a section of the questionnaire battery given to the mothers either before or at the home visit for later receipt. Second, mothers were asked about their experience of anger since having their baby within the SCAN interview, forming a part of the 1-hour interview at the beginning of the visit. Third, a two-minute episode of mother-infant interaction involving an activity board toy was recorded. This allowed for the subsequent observation of maternal anger/frustration by trained coders.

3.2.3 Measures

3.2.3.1. Anger before age sixteen. Within a questionnaire administered at Wave 1, mothers were asked to report whether they *got angry and lost my temper* before the age of sixteen, rated on a scale from 0 (not true) to 2 (certainly true). This item was embedded in a general questionnaire regarding childhood behaviour.

3.2.3.2. Anger in the past five years. Again, within a personality questionnaire administered at Wave 1, mothers were asked to report whether they had *had tantrums or angry outbursts* in the last five years. This item was rated as 0 (not true), 1 (somewhat true) or 2 (certainly true).

3.2.3.3. Contemporaneously measured anger during the perinatal period. Mothers completed the Adult Wellbeing Scale (Snaith et al., 1978) within the battery of questionnaires at both Waves 1 and 2. The AWB measures four constructs: outward irritability, inward irritability, depression, and anxiety. For the present analysis, three items were taken from the construct of outward irritability: ‘*I lose my temper and shout and snap at others*’, ‘*I feel I might lose control and hit or hurt someone*’, and ‘*people upset me so that I feel like slamming doors or banging about*’. These items were chosen specifically to indicate anger. Participants rated the behaviour as true either ‘definitely’, ‘sometimes’, ‘not often’, or ‘no not at all’. A higher score represented evidence of more anger. A mean of the three items was calculated at Waves 1 and 2, representing a composite score of contemporaneous anger at the third trimester of pregnancy, and at six months post partum.

3.2.3.4. Self-reported increase in anger after childbirth. During the semi-structured interview at the postpartum visit, mothers were asked a question regarding any experienced increase in impatience and/or irritability since the birth of their baby. If the mother reported any increase, further prompts followed to establish the nature of the change, such as ‘*How*

has that shown itself?, ‘*Do you tend to keep it to yourself or raise your voice or flare up without reason?*’, and/or ‘*Have you ever really lost your temper or your control?*’. Mothers’ responses to this item were transcribed verbatim, and any evidence of *increased expressed anger* post birth was later coded. Increased expressed anger was defined as any outward expression of anger that was greater than had been shown before birth, such as *shouting, having arguments, raising the voice, loss of temper, loss of control or flare ups for no reason*. Importantly, the increased expressed anger was coded regardless of the amount of baseline anger. Mothers were merely reporting if they had observed, in themselves, more anger than they tended to show before having their first baby.

3.2.3.5. Demographic characteristics. Details about measures were provided in Chapter 2. Relationship status was dichotomised to represent parents who were either in stable or unstable partnerships (married, cohabiting, in a relationship but not living together versus single or in an on/off relationship). Based on the measure of social class (SOC2000; Elias, McKnight & Kinshott, 1999), families were considered either middle (0) or working class (1). Mothers who had not obtained the basic qualifications of 5 G.C.S.E.s (scored as 1) were considered in comparison to those who had attained the basic level or higher (scored 0). Finally, mothers’ age at first birth was also considered, calculated using their age and gestation at wave 1, and the infants’ date of birth collected at Wave 2.

3.2.4 Data Analysis

For the first set of analyses, the continuity and change in anger across the transition to parenthood, transformation did not improve the distribution of all variables, and so non-parametric tests were conducted in all cases to ensure homogeneous power. The data were screened for violations of the assumptions regarding parametric tests, and the correct statistical tests were used in each case. For the second set of analyses, focusing on continuities in anger prior to childbirth, measures of anger were not normally distributed.

However, logarithmic transformation improved the normality to allow for parametric correlation analyses, and more confidence in the generalization of any factors derived from the Principal Components Analysis (Field, 2009). Finally, to assess the contribution of maternal pre-childbirth anger towards mother's increased expressed anger postpartum, whilst controlling for relevant sociodemographic variables, a binary logistic regression was conducted using a categorical outcome variable, and both continuous and categorical predictors.

3.3 Results

3.3.1 Change in Anger over the Transition to Parenthood

The first set of analyses summarises evidence for change in women's expression of anger between pregnancy and the assessment at six months postpartum.

3.3.1.1. Proportion of women who report anger before and after childbirth. The hypothesis that the frequency of women's anger may change between pregnancy and the postpartum period was tested by comparing scores for self-reported anger (the mean of three AWB items: *loss of temper*, *loss of control*, and *feelings of rage*) across the antenatal and postnatal assessment, in the same fashion as previous studies. Descriptive statistics for the separate items and composite score of anger are presented in Table 3. 1. Figure 1 presents the percentages of mothers who reported any evidence of each of the three anger items at pregnancy and six months postpartum. At both time points, loss of control is the rarest behaviour, reported by 15% and 12% of mothers at pregnancy and postpartum respectively. Rage is also a behaviour experienced by fewer women, with 43% and 44% reporting any evidence of this behaviour at each point in time. Loss of temper is a much more common behaviour, experienced by 64% of women during pregnancy and 75% of women at the postpartum assessment.

Table 3.2

Descriptive Statistics for Contemporaneously Measured Anger

Variable	Mean	Median	SD	Potential range	Actual range
Pregnancy					
Loss of temper	0.90	1.00	0.80	0 - 3	0 - 3
Feelings of rage	0.58	0.00	0.77	0 - 3	0 - 3
Loss of control	0.19	0.00	0.49	0 - 3	0 - 3
Composite anger	0.56	0.33	0.53	0 - 3	0 - 2.66
Postpartum					
Loss of temper	1.75	1.00	0.79	0 - 3	0 - 3
Feelings of rage	0.55	0.00	0.70	0 - 3	0 - 3
Loss of control	0.55	0.00	0.44	0 - 3	0 - 3
Composite anger	0.58	0.55	0.50	0 - 3	0 - 2.66

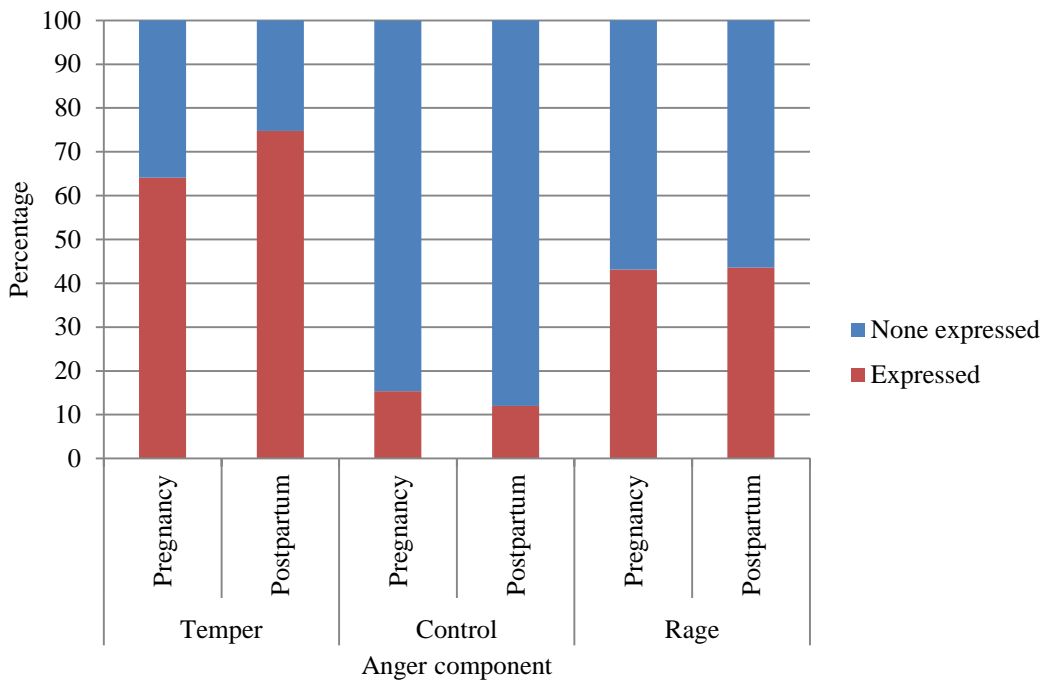


Figure 3.1. Percentages of mothers who do and do not report any evidence of loss of temper (temper), loss of control (control), or feelings of rage (rage) at pregnancy and postpartum.

3.3.1.2. Change in composite anger measure between pregnancy and six months postpartum. A Wilcoxon signed-rank test was conducted to assess within-subject difference over time. There was no significant difference between pregnancy ($Mdn = 0.33$) and postpartum ($Mdn = 0.50$) measured composite anger, $T = 5567$, ns (see Figure 1).

3.3.1.3. Change in individual items. As the general composite measure of anger showed no change over the transition to parenthood, the items that comprise the composite measure were analysed separately to determine any unique change over time for each element of anger. Non-parametric Wilcoxon Signed Ranks Tests were conducted to assess individual change between loss of temper, loss of control and feelings of rage. When analysed separately, loss of temper was the only element of anger that changed significantly in frequency; mothers reported losing their tempers more often after the birth ($Mdn = 1.00$) than before ($Mdn = 1.00$), $T = 3004.50$, $p < .01$, $z = -2.64$, $r = -.17$, although the effect was small. There was no significant change in frequency of loss of control ($T = 506.50$, ns , $r = .07$), or feelings of rage ($T = 2039.00$, ns , $r = .04$) between pregnancy the postpartum period (see figure 1).

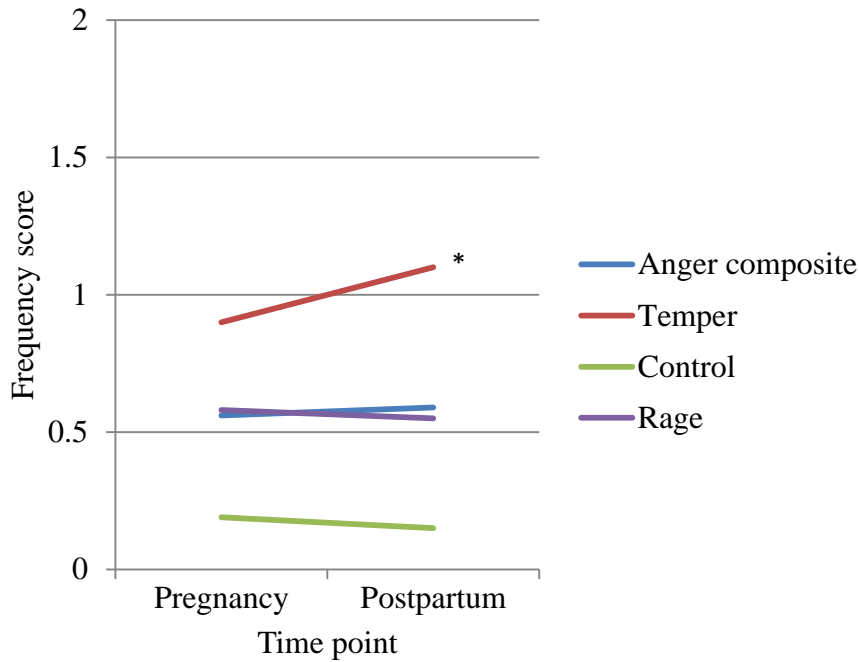


Figure 3.2. Mean frequency of loss of temper (temper), loss of control (control), feelings of rage (rage), and composite anger (mean of temper, control and rage) at pregnancy and six months postpartum. *Note.* * = a statistically significant change in frequency between pregnancy and six months postpartum.

3.3.1.4. Women’s perceptions of increases in anger after childbirth. Of the 234 mothers, 228 provided the necessary data to indicate whether they perceived an increase in anger since the birth of their baby in the semi-structured interview at six-months postpartum (3 mothers did not complete an interview, whilst in 3 cases the necessary questions were not answered).

The majority of mothers reported no increase in anger following birth (81.6%). However, 18.4% reported an increase in their expressions of anger following the birth of their baby. Importantly, the group who reported an increase by interview were more likely to have reported an increase when measured by questionnaire, $r_{pb}(228) = .14, p = .03$, suggesting some accuracy in this self-evaluation measure. Comparisons between the two groups

(mothers who report an increase versus those who do not) on demographic aspects were conducted. Mothers who did and did not report increased anger after the birth of their infants did not differ in age, social class, relationship status, or with respect to the gender of their child. However, there was a significant association between educational attainment and increased anger after birth, $\chi^2(1) = 8.21, p < .004, OR = 3.03, 95\% CI [1.38, 6.62]$. The standardized residuals revealed that mothers without basic qualifications were more likely to report increased expressed anger since the birth than would be expected.

3.3.2 Continuities in Women's Anger across the Lifetime

The following analyses examine anger in the postpartum period, in light of women's experience of anger at earlier periods in their lives.

3.3.2.1. Continuity in anger over the transition to parenthood. There was continuity in self-reported anger from pregnancy to six months postpartum. A bivariate correlation between levels of anger at Waves 1 and 2 revealed continuity in reported anger over time, $\rho(234) = .52, p < .001$. Bivariate correlations revealed a similar pattern of continuity within each individual item over time; loss of temper ($\rho[234] = .40, p < .001$), control ($\rho[234] = .33, p < .001$), and rage ($\rho[234] = .43, p < .001$).

3.3.3.2. Associations between retrospective and contemporaneous anger measures in pregnancy. Measurements of anger were significantly associated across each time point (see Table 3). There was a significant positive correlation between anger expressed in childhood and the past five years, $r(234) = .41, p < .001$. Anger in the past five years was significantly associated with anger measured at pregnancy, $r(234) = .50, p < .001$. Anger in childhood and pregnancy, the two furthest apart in timing, also showed a significant correlation, $r(234) = .29, p < .001$. These correlations are displayed in Table 3.

Table 3. 3

Interrcorrelations, Means, and Standard Deviations for Maternal Pre-Childbirth Anger Items

Measure	2	3	M	SD	Range
1. Anger before age 16	.41*	.29*	0.46	0.64	0 - 2
2. Anger in the last five years		.50*	0.43	0.60	0 - 2
3. Anger in pregnancy		-	0.56	0.53	0 - 2.7

Note. Means and standard deviations are reported using raw scores. Intercorrelations are reported using transformed scores. N= 234.

* $p < .001$

3.3.3.3. Construction of a composite measure of pre-childbirth anger. A principal components analysis (PCA) with oblique rotation (direct oblimin) was conducted on the three items measuring anger at different time points: anger before age 16, anger in the last five years, and anger in pregnancy. The Kaiser-Meyer-Olkin measure verified the sampling adequacy, $KMO = .62$, whilst Bartlett's test of sphericity showed that items were correlated sufficiently to allow PCA, $\chi^2(3) = 136.16, p < .000$. The analysis revealed one factor with an eigenvalue above 1 (1.81), which explained 60% of the variance. This suggests continuities in frequencies of anger across the points of retrospective and contemporaneous measurement. Individual scores resulting from the PCA were used to create a new summary variable, *pre-childbirth anger*, which provides a robust indication of women's anger before the birth of their first child. The variable pre-childbirth anger displayed the necessary normality to allow parametric analyses.

3.3.3.4. Associations between the pre-childbirth anger factor score and demographic characteristics. To determine associations between pre-childbirth anger and pertinent demographic characteristics, parametric correlation analyses and group comparisons

were conducted where appropriate. Women with fewer than the basic expected qualifications at age 16 reported more pre-childbirth anger than those with basic qualifications or more ($M = 0.62, SD = 1.07$ vs. $M = -0.12, SD = 0.95$), $t(232) = -4.25, p < .001$. Women who were in stable partnerships in pregnancy (married, cohabiting, or in a relationship but not living together) did not show a significant difference in pre-childbirth anger ($M = -0.04, SD = 0.97$) to those mothers not in stable partnerships ($M = 0.41, SD = 1.26$), $t(22.38) = 1.58, p = .13$. Women categorized as middle class scored lower on pre-childbirth anger ($M = -0.24, SD = 0.88$) than those of a working class background ($M = 0.35, SD = 1.07$), $t(170.43) = -4.41, p < .001$. Age showed an inverse correlation with pre-childbirth anger. Women who became mothers at a younger age scored higher in pre-childbirth anger than older women, $r(234) = -.37, p < .001$.

3.3.3.5. Pre-childbirth anger predicts self-perceived increases in anger after childbirth. There was a significant difference in pre-childbirth anger between the mothers who reported an increase in anger following birth with those who did not, $t(226) = -3.17, p = .002$. Specifically, mothers who experienced an increase in their expressions of anger after the birth of their baby had reported higher pre-childbirth anger ($M = .45, SD = .1.06$) than those who reported no increase in expressions of anger ($M = -.08, SD = -.08$).

Finally, a binary logistic regression was conducted to assess the unique contributions of pre-childbirth anger and other demographic characteristics to the prediction of mothers' anger following the birth of their first child. As shown in Table 4, pre-childbirth anger was revealed to be the only significant predictor ($\chi^2[1] = 1.85, CI = 1.25 - 2.74$). Indeed, mothers' education was no longer a significant predictor when pre-childbirth anger was taken into account. The odds ratio revealed mothers with higher pre-childbirth anger were 1.85 times more likely to experience an increase in anger following the birth of their first child.

Table 3.4

Logistic Regression Predicting Self-perceived Anger Increase

Variable	<i>B</i>	<i>SE</i>	χ^2	<i>eβ</i>	95% CI for OR
Constant	-2.20	1.08	4.20	0.11	
Pre-childbirth anger	0.62**	0.20	9.45	1.85	1.25 - 2.74
Less than basic education	-0.17	0.15	1.22	0.85	0.63 - 1.14
Infant gender	-0.39	0.37	1.12	0.68	0.33 - 1.40
Age at first birth	0.05	0.04	1.65	1.05	0.98 - 1.13
Unstable partnership	-0.16	0.75	0.05	0.85	0.20 - 3.67
Working class	0.20	0.50	0.19	1.22	0.50 - 2.98

Note. $R^2 = .07$ (Homer and Lemeshow), $.08$ (Cox and Snell), $.10$ (Nagelkerke).

** $p < .01$

3.4 Discussion

The first aim of the chapter was to assess the change in anger frequency over the transition to motherhood. Women reported significantly more occasions of losing their temper six-months after the birth as compared to levels during pregnancy. Although significantly different, the small effect size suggests the observed change in temper frequency is not large, and so a conclusion that first time parenthood leads to a dramatic increase in anger would be incorrect. In contrast, the intense manifestations of anger – loss of control and feelings of rage – did not show any change in frequency between the two time points.

However slight the overall increase, when mothers were asked directly by interview if they recognised an increase in anger in themselves since the birth, 18% reported they had more frequently displayed anger. This subset of mothers commented that they more often raised their voice, shouted, argued, flared up, lost their temper or lost their control than before the birth of their first child. For these mothers, the increase in anger was noticeable. For example, one mother commented in response to the question regarding an increase in anger:

“... (I express anger) at my partner mainly. Sort of snappy answers if he asks me something I’m sure he could have worked out for himself. I’m definitely snappier with him. That’s the one thing, the biggest thing I’ve noticed, is the change in my temperament. I used to be easy going with things.”

The second aim of this chapter was to investigate whether women’s expression of anger shows continuity between childhood and adulthood, which would allow for a feasible measure of pre-childbirth anger for use in further analysis. The data in the present study suggest that there are continuities in women’s anger between childhood, adulthood, and the perinatal period. Indeed the results of the PCA lend support to the concept of pre-childbirth anger, and provide a measure of general propensity to anger over time.

Finally, I considered whether women's general propensity to anger, pre-childbirth anger, was related to their experience of an increase in anger post partum. When the mothers who did report an increase in levels of anger were compared to those who did not, pre-childbirth anger differed significantly between groups. This difference remained significant after controlling for maternal education and other demographic characteristics. Indeed, mothers with higher pre-childbirth anger were nearly twice as likely to report an increase in anger in the interview at six months post partum. In summary, we are partially able to predict who may respond to first time parenthood with an increase in anger by their general propensity to anger over time before having their first child.

Following the previous discussion regarding the heterogeneity in previous research methods introduced in this chapter, efforts to address the issues mentioned and thereby clarify the incongruent findings were made in the current analyses. These points underlie the strengths of the data presented in this chapter. The data collected as part of the CCDS improves upon previous literature investigating the course of anger over the transition to parenthood in four previously described ways. Firstly, the previous research has often failed to define anger carefully and, therefore, the compositions of the measures of anger vary in specificity (some include items related to aggression) and intensity (by, for example, treating evidence of rage and mild irritation equally as anger). The current data improves upon this inconsistency by only including items that are specific to the expressed emotion of anger; losing one's temper, losing one's control, and rage.

When a composite score of anger was used, by summing items or averaging across them to create a composite score of anger – as in the fashion of the literature introduced earlier in this chapter – no increase in anger is displayed in the current data. However, when assessing the frequency of each individual item separately, a different conclusion can be drawn. Indeed, rage and loss of control do not increase in frequency by the postpartum

period. However, loss of temper does increase in frequency, and significantly so. These differences are highlighted in Figure 1. Rage and control loss are less frequent behaviours at both time points, experienced by a minority of women, and are unaffected by the addition of a new child in this sample. This finding provides a more detailed description of the course of anger over the transition to parenthood than previously described in the literature introduced earlier in this chapter. Similarly, the lack of appreciation for the dynamic nature of anger, whereby anger can be manifested as feelings of irritation to acute moments of rage, and a spectrum of intensities in between, may be a key factor in the discrepancies between research findings in previous literature.

The CCDS recruited mothers and fathers awaiting their first child. As previously explained, first time parents are unique in that their experience of the transition to parenthood is qualitatively different to mothers and fathers who are already practised in the process. Although this difference is largely ignored in the sample selection in the literature introduced in this chapter, Monk et al. (1996) showed that first-time parents report a variable anger response over the postpartum months, whilst experienced parents report a steady decline in anger. However, in the same study, experienced parents seem to show greater anger pre- and post-partum than first time parents. The potential buffering, or exacerbating, effect that experience has on anger responses may well be complex, and calls for a more thorough investigation. However, for the purposes of the current study, holding the previous motherhood experience of women constant offered the most transparent design for measuring change in anger expression following birth.

The links between age and anger are complex according to previous literature. Longitudinal studies have shown a steady decline in anger expression across adulthood (Galambos, Barker, & Krahn, 2006; Mirowsky & Ross, 1995). However, Graham and colleagues (2002) observed older mothers experience greater anger than younger mothers.

These differences in findings may be due to the heterogeneity in sample characteristics. In the current data, maternal age at first birth was negatively related to pre-childbirth anger; mothers who had given birth at a younger age reported higher levels of pre-childbirth anger than older mothers. This pattern may be apparent for two reasons. Firstly, the data may support previous literature proposing that levels of anger decline across life, (e.g. Mirowsky & Ross, 1995), whereby the decreased anger in older mothers may be a factor of the cohort, which in effect represents a cross-section of ages. Alternatively, mothers who have their first child at a young age may also experience more anger indirectly. Social determinants, such as education or economic hardship, may be indirectly related to their likelihood to have children at younger ages. Interestingly, although maternal age did show a significant association with pre-childbirth anger; mothers who did or did not report an increase in anger did not differ significantly in terms of age. This suggests that responding to a first child with an increase in anger is phenomena experienced by some women irrelevant of their age. Alternatively, young mothers may be less able to recognise emotions in themselves.

Differentially, maternal education was related to pre-childbirth anger, and the only significant demographic factor in discriminating between those mothers who did or did not recognise an increase in anger post partum. Mothers with fewer than basic educational qualifications had significantly higher pre-childbirth anger scores. They were also more likely to experience an increase in anger post partum, but this relationship was no longer significant when pre-childbirth anger was taken into account. Women with less education may by default have fewer means to cope with the challenges of parenthood; perhaps financially, but potentially emotionally – as the current data suggest. Reasons for this relationship warrant further investigation.

Although there are clear attempts to improve upon previous literature regarding anger and the transition to parenthood in the current design, there are further issues that require

clarification, and aspects of the design that could be improved upon. The method with which contemporaneous anger is measured during pregnancy and six-months postpartum may be limiting. Previous studies have used a more transparent measure of frequency, by reporting how many days of the past week the individual expressed anger, for example (e.g. Mirowsky & Ross, 1995). Forcing the participant to count the number of days, rather than make a self-imposed rating, could potentially ensure more accuracy across participants, and perhaps reveal more variation in scores. However, the method used in the current analysis was sufficiently comprehensive for its purpose as it allowed for the detection of individual change over time with respect to the more common behaviour of temper loss.

In measuring differences in anger between pregnancy and postpartum, the data may present an underestimation of the anger increase. Pregnancy itself is a potentially stressful period, with physical and emotional challenges that may also be frustrating. A more comprehensive measure of anger increase over the transition to parenthood would require a baseline measure, pre-pregnancy, using a prospective design. Indeed, some mothers may already be experiencing an increase in anger during pregnancy that is not further affected by the birth, and therefore would not be captured by the current data. A high level of anger in pregnancy is a risk factor for adverse infant outcome (Field, 2002), and pregnancy may, therefore, be a period of time worthy of study with anger in mind. Consideration for the course of anger from before pregnancy and through to the postpartum period is therefore a potential topic for further research.

In summary, the data reveal that anger is a pertinent emotion in the transition to parenthood for first-time mothers, specifically as its manifestation as loss of temper, rather than the higher intensity rage or loss of control. Furthermore, an increase in personal levels of anger following the addition of a first child was perceived by a significant number of women. Women who perceive an increase in their levels of anger over the transition to first time

motherhood report more pre-childbirth anger than those who do not. The following research questions derived from the finding that anger is a salient emotion in early parenthood form the basis for the remainder of this thesis, as follows:

(1) *What is the association between postpartum depression and anger for new mothers?* Postpartum depression is a common complication after childbirth, and depression is often associated with anger (Goldman & Haaga, 1995). Observing the interplay between anger and depression in the perinatal period, therefore, may further the understanding of the clinical difficulties experienced in a number of women following birth.

(2) *Does anger increase over the transition to parenthood within the parents' partner relationship?* Noticing an increase in temper loss with partners was a common complaint made by the mothers in the CCDS in response to the increased anger question within interview. Furthermore, there is ample previous evidence for an increase in conflict generally within marriages during the transition to parenthood (Belsky & Kelly, 1994).

(3) *What relevance does the anger expressed by new parents have for the developing infant?* Infants are able to distinguish between anger and other emotions from within the first year of life (Haviland & Lelwica, 1987) and, therefore, may be affected by their exposure to anger from early in development.

CHAPTER 4.

MATERNAL ANGER AND PERINATAL DEPRESSION

4.1 Introduction

The aim of this chapter is to consider the interplay between maternal anger and perinatal depression. Anger is a relatively understudied topic as compared with depression in the context of motherhood; however a small set of literature has considered the prevalence and salience of anger across the transition to motherhood for some women. These data are largely supported by findings in the previous chapter. Thus, the current chapter will explore whether the emotion of anger is especially salient for new mothers in the context of a clinical mood disorder. Specifically, I will investigate whether mothers with antenatal and postnatal depression, respectively, report higher levels of concurrent anger than mothers who are not depressed. I will also consider the relation between anger and depression across time, specifically, whether levels of anger reported during pregnancy predicts the onset of postpartum depression.

4.1.1 Perinatal Depression

The majority of research examining maternal mental health has concentrated on maternal depression. A relatively common disorder, postpartum depression has an estimated prevalence of 13% (Beck, 2001). Due to its high prevalence rate, and its hypothesised links

to unfavourable child outcomes such as emotional maladjustment (Carter, Garrity-Rokous, Chazan-Cohen, Little, & Briggs-Gowan, 2001) and violent conduct symptoms (Hay, Pawlby, Angold, Harold, & Sharp, 2003), hypothesised causes and risk factors for postpartum depression have been studied extensively. A series of robust risk factors for postpartum depression has been suggested, including single parenthood, socioeconomic status, unplanned/unwanted pregnancy, a history of depression, antenatal depression and infant temperament (Kumar & Robson, 1984).

Approximately 30-50% of postpartum depression cases have an onset during pregnancy (Hobfoll, Ritter, Lavin, Hulsizer, & Cameron, 1995). Point-prevalence estimates from a meta-analysis across many samples suggests approximately 18.4% of mothers experience are depressed during pregnancy (Gavin et al., 2005), although the confidence intervals for the reported incidence are wide. Depression during pregnancy has long been considered a predictor of postpartum depression, but recent research has suggested antenatal depression conveys its own unique risk for the developing child. Indeed, antenatal depression predicts violence in adolescent offspring whilst controlling for depression in the postpartum period (Hay, Pawlby, Waters, Perra, & Sharp, 2010).

As suggested in a less abundant set of studies, and supported in the previous chapter, the birth of a baby is associated with an increase in anger (Ross & van Willigen, 1996), although an accurate documentation of its frequency, causes, and effects are lacking. Indeed, its increase is contradicted by some who report a decrease in anger (Monk et al., 1996). An increase in the expression of anger may not be entirely unexpected when considering the obstacles that a new baby place upon parents' lifestyles. Such a response may be considered quite expectable given the demanding challenge that is becoming a parent. Factors that are associated with the period after childbirth, such as poor sleep quality (Marques et al., 2011) may contribute to feelings of frustration and anger alone. Indeed, given that depression is

documented to affect a significant number of women in the perinatal period, and depression itself has been associated with anger (e.g. Goldman & Haaga, 1995), the rationale for its study in pregnancy and the postpartum is clear.

4.1.2 Depression and Anger

Although relatively little is known about the association between depression and anger in pregnancy and parenthood specifically, their general association at other points in the life course has long been speculated upon (Spiegel, 1967). Freud (1917) first introduced the notion that depression is caused by anger turned inward. Similarly, recent research has postulated that depression occurs when an individual suppresses their anger (Brody et al., 1999; Goldman & Haaga, 1995; Riley et al., 1989; Robbins & Tanck, 1997). Balsamo (2010) suggested that anger and depression are linked by their common association with the tendency to ruminate. In contrast, it has been argued that felt anger may indeed be a sign of recovery from a depressed episode (Weissman, Fox, & Klerman, 1973). In summary, literature suggests the relationship between anger and depression is complex; there is much left to understand.

A consistent finding that emerges from the literature is that individuals with depressed affect, dysphoria or a diagnosis of clinical depression report higher levels of anger on various measures in comparison to those without any evidence of depression. When measured daily, individuals in a sample of non-depressed undergraduates showed an association between self-reported levels of anger and depressed affect (Robbins & Tanck, 1997). Specifically, on the days in which they either inhibited expressions of their felt anger, or attributed the anger to their own actions, individuals were more likely to report depressed affect (Robbins & Tanck, 1997). Using similar methods to measure patterns of dysphoria and anger over four time points within a day, research has shown that the two are often experienced concurrently (Wenze, Gunthert, Forand, & Laurenceau, 2009). Furthermore, those who had higher levels

of anger initially showed a more marked association between their anger and dysphoria. They also showed a slower speed to recovery over the course of the day. These studies suggest anger and depressed affect are closely related in day-to-day measures of depressed and non-depressed individuals. Indeed, they are often experienced in parallel.

In samples of individuals meeting diagnostic criteria for depression, a similar trend between anger and depression has been found. In short, individuals with depression score higher on measures of anger than those without (Goldman & Haaga, 1995; Riley et al., 1989; Sperberg & Stabb, 1998). This comparison remains significant in samples measuring depression in women only (Thomas, 1989).

Depression is also associated with anger in its more acute expression. First reported by Fava, Anderson and Rosenbaum (1990), episodes of Major Depressive Disorder (MDD) can commonly include “anger attacks”. This variation in profile is displayed as sudden spells of anger that are uncharacteristic of the individual and inappropriate to the situation. Such spells of felt anger have been observed as a variant of major depressive disorder in approximately as many as 30-40% of outpatient cases (Fava & Rosenbaum, 1998). Furthermore, they are more commonly found in depression than anxiety. Indeed, twice as many outpatients with depression display anger attacks than those with anxiety disorders (Gould et al., 1996).

As well as documenting cross-sectional associations between anger and depression, research has shown that depression and anger are also linked over time. Indeed, higher levels of anger are observable not only during but following the depressive episode. Indeed, individuals who have been depressed and subsequently recovered (but were at a risk of a future episode due to the common recurrence of depression) reported more anger than individuals who had never been depressed (Brody et al., 1999; Ingram et al., 2007). This pattern has also been reported when measured longitudinally; high depression scores

measured at eighteen years of age were related to heightened anger experienced five years later (Gjerde & Westenberg, 1998). However, this relationship was found only in men.

Given the recurrent nature of depression and its association with anger, it is feasible that anger may also predict the onset of depression. There is evidence to suggest that conduct disorder symptoms in childhood predict depression in adulthood (Hay, Pawlby, et al., 2010; Romano, Zoccolillo, & Paquette, 2006; Zoccolillo, Meyers, & Assiter, 1997), although the specific role of anger-based symptoms in this association is not known, and the conclusions are based on disadvantaged or adolescent mothers. In a separate area of literature, depression and impulsivity have been hypothesised to be similarly explained by lowered serotonergic functioning, manifested as a lack of effortful control (Carver, Johnson, & Joormann, 2008). Similarly, individuals with depression exhibit difficulties both ignoring negative information (Frings, Wentura, & Holtz, 2007) and disengaging from it (Caseras, Gamer, Bradley, & Mogg, 2007), a component also true in those prone to anger (Owen, 2011). Thus, the association between anger and depression may be explained by shared cognitive factors that may or may not occur outside of the episode itself. At the very least, the measurement of anger may provide a useful screen for concurrent or later depression, which may extend to the perinatal period.

In summary, depression and anger appear to be linked when measured within an individual's pattern of felt emotion over the course of a day, when comparing contemporaneous levels in individuals with and without depression, and when observed longitudinally. There are many alternative explanations for their association; depressed affect may cause an increase in anger through the accompanying frustrations that a depressive episode places upon an individual, or perhaps heightened anger is already present in those individuals who later experience depression through a predisposition to extreme emotions or negative cognitions and attributions. The direction of effects is unclear. However, measures

of state- versus trait-anger correlate equally with depressed affect (Moreno, Fuhriman, & Selby, 1993), suggesting both dispositional and situational anger may be important in depression.

4.1.3 Depression and Anger in the Perinatal Period

Considerably less research has examined depression and anger simultaneously in the pre- and post-natal period, although some evidence suggests the pattern observed in the general literature may be similar. In one qualitative analysis, mothers with postpartum depression reported that feelings of anger can fill their day-to-day interactions with their infant (Beck, 1996). Field et al. (2002) found that mothers with high anger prenatally were also more likely to score highly on depression and anxiety scales, suggesting an association in pregnancy at least.

Few studies have examined anger attacks in perinatal women, although one study suggested up to 60% of women attending a psychiatric clinic during pregnancy and up to 18 months postpartum had reported anger attacks (Mammen et al., 1999). Furthermore, these individuals were also more likely to be diagnosed with unipolar depression over other disorders, had higher trait anger, and were more likely to become aggressive. The presence of anger attacks with depression in new mothers is particularly pertinent to note, given that the offspring of such mothers (as compared to those with depression but without anger attacks) also showed higher rates of delinquency, aggressive behaviour, attention problems and lower school competency when measured concurrently (Alpert et al., 2003), although this conclusion is based on cross-sectional, maternal reported data within a small sample.

One avenue of research that has considered anger and depression in the postpartum period, albeit indirectly, focuses on mother-infant interaction. A variety of differences in mother-infant interaction between depressed and healthy mothers have been documented (Cohn et al., 1990), one of which is a tendency to display intrusive behaviour. Intrusiveness is

partly characterized by expressions of anger and irritation (Szabo et al., 2008), lending further support for an association between depression and anger in the post-natal period. Indeed intrusive maternal behaviour is thought to be the most risky for the development of emotional problems in toddlers in comparison to a withdrawn manifestation of depression (Mantymaa, Puura, Luoma, Salmelin, & Tamminen, 2004).

4.1.3.1. Potential explanations for the interplay between anger and depression in mothers. Sleep problems such as decreased total sleep time and efficiency of sleep are a common complaint both during pregnancy (Marques et al., 2011; Schweige, 1972; Suzuki, Dennerstein, Greenwood, Armstrong, & Satohisa, 1994) and in the postpartum period (Bei, Milgrom, Ericksen, & Trinder, 2010). Aside from the perinatal period, sleep disturbances are related to mood disorders in the general population (Tan, Kales, Kales, Soldatos, & Bixler, 1984), and are a prevailing feature of Major Depressive Disorder (MDD) (Hamilton, 1989). Sleep disturbances are also associated with feelings of anger (Bardwell, Berry, Ancoli-Israel, & Dimsdale, 1999; Caska et al., 2009; Ottoni, Lorenzi, & Lara, 2011; Pilcher, Ginter, & Sadowsky, 1997; Shin et al., 2005; Waters, Adams, Binks, & Varnado, 1993). Despite these associations, few research studies to date have considered the joint interplay between anger, sleep and depression during the perinatal period.

The relationship between depression and sleep in normal populations is likely to be bidirectional. Whilst symptoms of insomnia are predictive of depression, depressive episodes are also causal in the onset of sleep problems. A number of studies assessing associations between insomnia and depression unanimously agree that insomnia is a risk factor for the later development of MDD (Breslau, Roth, Rosenthal, & Andreski, 1996; Chang, Ford, Mead, CooperPatrick, & Klag, 1997; Eaton, Badawi, & Melton, 1995; Riemann & Voderholzer, 2003). Longitudinally, insomnia is a significant predictor of MDD even after controlling for prior depressive symptoms (Breslau et al., 1996). This predictive association

persists for at least 30 years, as shown by Chang et al. (1997) who found that both difficulties sleeping under stress and pure insomnia in early adulthood predicted the onset of MDD in subsequent years.

The robust association between sleep and depression onset is partially extended to samples of postnatal women. Sleep disturbances and subjective sleep quality have been shown to predict the likelihood of postpartum depression independent of other risk factors such as the marital relationship, previous depressive episodes (including those during pregnancy) and stressful life events (Dorheim, Bondevik, Eberhard-Gran, & Bjorvatn, 2009). In a subsequent study of mothers at low risk for postpartum depression measuring sleep quantity and quality using objective measures (actigraphy), sleep was not found to predict postpartum mood in the first week following birth (Bei et al., 2010). However, subjective ratings of sleep quality made by the mothers did predict the onset of depressive mood symptoms shortly after birth. Given that the latter study recruited a low risk sample, the reported lack of association with objective measures may not be replicable in other populations. Indeed, in a sample of women with a previous history of depression MDD or postpartum MDD, an incremental decrease in sleep quality represented a 25% increase in risk for postpartum depression. Together, the research suggests that sleep disturbances are predictive to the onset of postpartum depression.

In a separate collection of literature, increased feelings of anger have been shown to link with a variety of sleep disturbances. These include difficulty falling asleep, middle insomnia, early waking, excessive daytime sleepiness, poor quality sleep and less total sleep time (Bardwell et al., 1999; Caska et al., 2009; Ottoni et al., 2011; Pilcher et al., 1997; Shin et al., 2005; Waters et al., 1993). As a cross-sectional design was used in each study, the direction of the effect is to date untested; it is assumed that higher trait anger leads to

disrupted sleep, but it is also feasible that a lack of sleep may induce feelings of anger. Indeed, the relationship may be bidirectional.

To elucidate the link between sleep and anger further, Caska and colleagues (2009) found that anger was positively linked to sleep problems in patients with coronary heart disease, but only when it was suppressed (anger-in). Indeed, higher scores in expressed anger (anger-out) were related to better sleep quality in this population. Interestingly, Stewart, Rand, Hawkins and Stines (2011) found that neither anger nor depression predicted poor sleep quality alone, but rather their shared variance (including that of anxiety) better accounted for sleep quality. This gives clear evidence for interplay amongst depression, anger and sleep.

Women who face an unintended pregnancy are thought to be at an increased risk for postpartum depression (Barber, Axinn, & Thornton, 1999; Christensen, Stuart, Perry, & Le, 2011). It is arguable that an unintended pregnancy may also result in increased feelings of anger as anger stems from a perceived block in meeting a goal, and an unintended pregnancy may be conceptualised as substantive interruption to life plans. Furthermore, perceived lack of control is a known to cause anger when induced experimentally (Hodapp, Heiligtag, & Stomer, 1990), and attributions of controllability are highly related to the experience of anger (Smith, Haynes, Lazarus, & Pope, 1993) and unintended pregnancies may be a naturally occurring and substantive cause of anger for some individuals.

Other situational factors may be pivotal to the expression of anger and the onset of depression in the postpartum period. The experience of severe pain during delivery and beyond has been implicated in the onset of postpartum depression, with severe pain increasing the risk of depression threefold (Eisenach et al., 2008; Gutke, Josefsson, & Oberg, 2007). Likewise, pain is known to interact with anger expression (Bruehl, Liu, Burns, Chont, & Jamison, 2012), with trait anger predicting pain response, and experienced pain triggering

anger in a momentary analysis. Similarly, obstetric factors and pregnancy complications have been implicated as predictors of postpartum depression (Campbell & Cohn, 1991; Murray & Cartwright, 1993), and may also be related to the experience of anger via the unexpectedness of the event (such as an emergency caesarean) or the continued pain that can occur. Thus, consideration of both delivery pain and obstetric complications in the interplay between depression and anger in the postpartum period may be important.

In summary, the research described above suggests not only that anger may be salient emotion in the perinatal period, but that this is potentially related to a diagnosis of depression. The relationship between them may be particularly relevant in the perinatal period, as becoming a parent is a life event of great challenge. Indeed, the heightened risk conveyed to infants and the developing child when depression is characterized by anger-laden intrusive behaviour (Mantymaa et al., 2004) or shares comorbidity with anger attacks (Alpert et al., 2003) suggests that the study of maternal anger is a particularly pertinent topic for consideration. The current chapter will consider mothers' anger expression compared between those with and without antenatal and postnatal depression. The substantive issues of disturbed sleep, unintended pregnancy, obstetric complications and labour pain may offer a further explanation of how depression and anger may co-vary in the perinatal period.

As this thesis concentrates on the prediction of postpartum experiences, the analyses will also test whether postpartum depression is predicted by anger in pregnancy. Previous research suggests that anger and depression are predictive of each other over time, although the nature of this relationship is little understood. To my knowledge, there exists no study of anger as a predictor of postpartum depression. Therefore, the data contained in this chapter will explore whether anger in pregnancy is significantly associated with a later diagnosis of postpartum depression, whilst controlling for known risk factors.

4.1.4 Aims of the Chapter

In light of this review of relevant research, I aim to document whether anger is associated with antenatal and postpartum depression in a representative sample of first-time mothers in Cardiff, UK. Specifically, I will test whether contemporaneously measured anger during pregnancy and at six-months postpartum is greater in those with a diagnosis than of depression than those without at each time point. Other relevant sociodemographic factors will be considered as control variables (stable partnerships, socioeconomic status, maternal age, educational attainment). As suggested in the summary above, sleep problems, unintended pregnancies and perceived pain during labour may also be pertinent factors in the prediction of anger and depression.

As well as considering the concurrent relationship between anger and depression, I will also consider whether anger during pregnancy is predictive of postpartum depression. This specific focus on postpartum experience is in keeping with the aims of the thesis; do pre-childbirth experiences predict postpartum outcomes? The presence of antenatal depression is the most consistent predictor of postpartum depression in the literature, even after controlling for past episodes of depression. The current chapter will consider whether levels of anger in pregnancy also contribute to the prediction of postnatal depression, whilst controlling for a history of anger and antisocial behaviour (an established predictor of depression), and other pertinent risk factors.

4.2 Method

4.2.1 Subsample of Participants in Chapter Four

Participants this chapter represent a subsample of the 234 mothers studied in the previous chapter, as the contemporaneous measures of anger at pregnancy and six months post partum were again necessary. Two of the 234 mothers did not complete the interview at Wave 2. Therefore, a diagnosis of depression at the postpartum period could neither be confirmed nor disconfirmed. Thus, the sample for this chapter comprised 232 women, 99% of the sample used for Chapter 3.

4.2.2 Procedure

A brief outline of the procedures relevant to the current analyses of perinatal depression and anger is presented. Details regarding the full procedure are contained in Chapter 2.

4.2.2.1. The antenatal assessment. Families were visited by CCDS researchers at home during the third trimester of pregnancy, with the mother and father each completing an interview with a separate researcher. The interview contained an assessment of mental health which provided the measure of antenatal depression, and of mothers' history of depression. Questionnaires completed at the antenatal time point, either collected during this assessment or received shortly afterwards, provided data regarding anger and the pregnancy experience.

4.2.2.2. The postpartum assessment. Families were again visited at home by a researcher at approximately six months post partum. In this visit, a further interview took place, much like that in the antenatal period. This interview contained an assessment of the mother's mental health referring to the six-months after the birth of their child. Again, questionnaires were provided and collected during the assessment, or later returned by post.

4.2.3 Measures

4.2.3.1. Contemporaneously measured anger in the perinatal period. Mothers completed the AWB (Snaith et al., 1978) within the battery of questionnaires at both Waves 1 and 2, as described in the previous chapter. The maternal anger measure was comprised of three AWB items: *'I lose my temper and shout and snap at others'*, *'I feel I might lose control and hit or hurt someone'*, and *'people upset me so that I feel like slamming doors or banging about'* as previously described. Scores for the three items were averaged, and were reported at both the pregnancy and postpartum time points. A log-transformation was conducted to adjust the skew and kurtosis of the variables. Thus, parametric analyses were feasible.¹

4.2.3.2. Perinatal and prior depression. Evidence for both antenatal and postnatal depression was determined using the Schedules for Clinical Assessment in Neuropsychiatry (SCAN; Wing et al., 1990), a semi-structured standardized clinical interview of psychopathology symptoms. This was administered at both assessments, with the antenatal interview also used to determine the presence of any past (before pregnancy) episodes of depression. Interviews were later transcribed, and each symptom rated. DSM-IV criteria were used to rate the presence or absence of a major depressive episode at each time point, with five or more symptoms, including at least core symptom of depression, required to be present in the same minimum two-week period for a diagnosis to be made. An episode of depression was also coded as present when the mother had been prescribed antidepressant medication during pregnancy.

At the postpartum period, a triage approach was taken to streamline the process of diagnosis. Three items matching the Whooley questions as recommended by NICE for the initial screening of depression in postpartum women were first analysed for any evidence of

¹Contemporaneously measured maternal anger was not transformed in the previous chapter in order to maintain identical power across statistical tests when comparing rage, control loss and temper loss across time points. For the purposes of this chapter, contemporaneous maternal anger was transformed to improve the normality of the variable and the residuals in subsequent regression analyses.

depressive mood. These included: *‘Have you often been bothered by feeling down, depressed, or hopeless?’* *‘Have you often been bothered by little interest or pleasure in doing things?’* *‘Have you sought help for this?’* A further item asking mothers about antidepressant prescription was also considered for all cases. If none of the items were endorsed positively, the individual was assumed to have not experienced a depressive episode. If at least one of the items was endorsed, the interview was transcribed in full, and a diagnosis was determined along an identical protocol to that used during pregnancy. Again, if antidepressants had been prescribed in the postpartum period, a diagnosis of depression was assumed.

At both time points, the accuracy of the research-determined diagnoses were checked with a psychiatrist (Dr. Roland Jones or Dr. Ian Jones). Of the cases that were rated as definitely not depressed, 20 randomly selected cases at each time point were taken to case conference with one of the psychiatrists. Agreement was 100% at both pregnancy and the postpartum period. All cases of depression were rated twice, along with 20% of the cases rated as not depressed. Reliability between researchers and psychiatrists was significant for antenatal depression ($\kappa = .78, p < .001$), postpartum depression ($\kappa = .80, p < .001$), and past diagnoses ($\kappa = .76, p < .001$).

Dichotomous variables of depression status were created, with a score of 0 representing no depression, and 1 representing evidence of a depressive episode in each of the three time points: prior to pregnancy, during pregnancy, and during the first six postpartum months.

4.2.3.3. Mother’s history of antisocial symptoms. Mother’s antisocial history was included as a potential confound in the association between anger in pregnancy and postpartum depression. Mothers provided information about their history of antisocial behaviour in childhood and adulthood by questionnaires administered at pregnancy. Items

referring to childhood conduct symptoms were included in a questionnaire titled ‘What I Was Like as a Child’. Adult symptoms in line with a diagnosis of antisocial personality disorder via the DSM-IV were also included in a personality questionnaire titled ‘What I am Like’. Items corresponding to ASPD were taken from the International Personality Disorder Examination screening instrument (IPDE; Loranger et al., 1994). A composite score combining both the conduct and antisocial symptoms was created and showed good internal consistency, $\alpha = .79$.

4.2.3.4. Planned pregnancy. During pregnancy, mothers were asked by questionnaire whether their pregnancy was planned or unplanned. This formed a dichotomous variable for analysis, with a score of 0 representing a planned and a score of 1 an unplanned pregnancy.

4.2.3.5. Sleep disturbances. Sleep disturbance scores were calculated from four items: delayed sleep, poor quality sleep, middle insomnia and early waking. These items were taken from the SCAN interview, and were considered in every case (not just those mothers who had a diagnosis of depression). Each item was scored as either *not present* (0), *possibly present* (1) or *definitely present* (2). A sum of the four items was used to represent total sleep disturbances. Because this variable was significantly skewed, sleep disturbances were dichotomised between none (0) and any sleep disturbance (>1).

4.2.3.6. Obstetric complications. Mothers were asked in the interview about their experiences during their pregnancy, labour and delivery. Possible complications included vaginal bleeding in pregnancy, high blood pressure in pregnancy, eclampsia, and caesarean section, although mothers were asked an open-ended question about their own complications, so responses varied. Classification was made dichotomously, comparing no obstetric complications (0) to at least one complication (1).

4.2.3.7. Perceived pain during delivery. During the postnatal interview, mothers were asked about their experiences of pain during the labour and delivery. Perceived pain was rated as either: (1) less than expected, (2) about as expected, or (3) worse than expected.

4.2.4 Data Analysis

At first, consideration was paid to the incidence of perinatal depression in the sample used in this analysis, and to the univariate relationships between both maternal anger and depression and the various maternal characteristics (demographic factors, intention of pregnancy, delivery pain, sleep disturbances, and obstetric complications).

To address the first empirical question, whether contemporaneous anger was different between mothers with and without depression, maternal anger scores in pregnancy were compared between mothers with and without diagnoses of antenatal depression. Anger scores at six months post partum were similarly compared between mothers with and without postnatal depression. A linear regression was conducted at each time point, controlling for demographic factors at the first step. For the antenatal analysis, the planned pregnancy variable was also added as a control variable on the relationship between antenatal depression and anger. For the postnatal analyses, further variables that could potentially explain the relationship between depression and anger were also included.

To address the second question, the prediction of postnatal depression from mothers' anger in pregnancy, a logistic regression was conducted. The prediction of postpartum depression via the contribution of mother's pregnancy and measured anger was assessed, whilst controlling for antenatal depression, prior depression, mothers' antisocial history, and demographic risk at the first step.

4.3 Results

4.3.1 The Incidence of Depression over the Perinatal Period

In pregnancy, 25 (10.8%) of the 232 mothers met DSM-IV criteria for an episode of depression. Between birth and six-months postpartum, 21 (9.1%) of the 232 mothers who participated met DSM-IV criteria for postnatal depression².

4.3.2 Univariate Associations between Maternal Characteristics, Depression and Anger

Mothers who were depressed in pregnancy were more likely to have lower than the basic educational qualifications than mothers who were well, $\chi^2(1) = 8.40, p < .001$, OR = 3.60, 95% CI [1.45, 8.92]: Of the mothers with less than the basic educational attainment, 24.3% were depressed in pregnancy, whilst only 8.2% of mothers with the basic or higher than basic education developed antenatal depression. Mothers in unstable partnerships were also more likely to become depressed in pregnancy, $\chi^2(1) = 30.21, p < .001$, OR = 13.45, CI [4.35, 41.57]; only 7.8% of mothers in stable partnerships developed antenatal depression, whilst 53.3% of those in unstable partnerships did so. Mothers with antenatal depression were also more likely to be from a working class background, $\chi^2(1) = 15.90, p < .001$, OR = 5.94, CI [2.27, 15.52]; 20.9% of mothers classified as working class became depressed, compared to 4.3% of those from a middle class background. . In terms of maternal age, mothers with antenatal depression were younger ($M = 23.64, SD = 5.43$) than mothers who were well during pregnancy ($M = 30.28, SD = 5.31$). Mothers who had unplanned pregnancies were also more likely to have become depressed in pregnancy, $\chi^2(1) = 25.17, p < .01$, OR = 3.03, CI [1.21, 7.51]; 16.4% of mothers who had unplanned pregnancies became depressed compared to 6.1% of those who had planned pregnancies.

² The incidence of perinatal depression in the sample used in Chapter 4 was lower than that within the full CCDS sample, of which 16.9% met criteria for antenatal depression and 11.1% for postnatal depression, rates in line with population estimates.

A slightly different pattern emerges when comparing mothers with postnatal depression to those who were well. Mothers with postnatal depression were more than likely to have less than basic qualifications than those who were not depressed, $\chi^2(1) = 12.47, p < .001, OR = 4.90, 95\% CI [1.89, 12.69]$. Indeed, of those mothers who had less than the basic expected level of qualifications, 24.3% became depressed postpartum compared to 6.2% of those with more than the basic level. A greater proportion of mothers in unstable partnerships became depressed (26.7%) than those in stable relationships (7.8%), $\chi^2(1) = 6.04, p < .01, OR = 4.28, CI [1.23, 14.89]$. However, the risk for postpartum depressed did not depend on mothers' social class, $\chi^2(1) = 1.68, ns$. Mothers with postnatal depression were significantly younger ($M = 26.55, SD = 6.70$) than those without ($M = 29.86, SD = 5.48$), $t(22.52) = 2.11, p = .05$. As with antenatal depression, mothers who had planned their pregnancies were less likely to have antenatal depression (6.1%) than those that had not (16.4%), $\chi^2(1) = 6.13, p < .01, OR = 3.03, CI [1.21, 7.51]$.

Mothers who had experienced obstetric complications were no more or less likely to experience postnatal depression, $\chi^2(1) = 0.93, ns$. Neither was the experience of pain related to a diagnosis of depression, $t(171) = 1.06, p = .24$. As expected, the total number of sleep problems postpartum was related to a diagnosis of postpartum depression; mothers with depression reported more sleep disturbances ($M = 1.48, SD = 1.72$) than those without depression ($M = 0.35, SD = 0.81$), $t(2.96) = 20.92, p < .01$.

When considering the relationship between maternal anger in pregnancy and maternal characteristics in the subsample ($N = 232$) used in Chapter 4, a similar pattern emerges. Mothers with lower than the basic educational qualifications reported more anger ($M = 0.90, SD = 0.69$) than those who has at least the basic level ($M = 0.49, SD = 0.47$), $t(42.47) = 3.44, p = .001$. No significant difference in reported anger was observable between mothers who were single or in a stable partnership ($M = 0.84, SD = 0.75$ vs. $M = 0.54, SD = 0.51$), $t(14.89)$

= -1.55, $p = .14$. Mothers classified as working class reported more anger ($M = 0.73$, $SD = 0.47$) than those of middle class ($M = 0.44$, $SD = 0.45$), $t(153.57) = -3.92$, $p < .001$. As with depression, mothers' age showed a significant association with anger, with younger mothers reporting the most anger, $r(232) = -.34$, $p < .001$). Levels of anger in pregnancy showed a trend towards a significant difference when comparing between mothers who had planned ($M = 0.52$, $SD = 0.50$) or unplanned pregnancies ($M = 0.67$, $SD = 0.59$), $t(230) = -1.97$, $p = .05$.

The level of mothers' anger reported postpartum was next tested for its association with maternal characteristics. Educational attainment was unrelated to anger (less than basic $M = 0.21$, $SD = 0.14$; at least basic $M = 0.17$, $SD = 0.13$). Social class was also unrelated to postpartum anger (working class $M = 0.66$, $SD = 0.57$; middle class $M = 0.54$, $SD = 0.45$), $t(158.72) = -1.70$, $p = .09$. Maternal postpartum anger appeared greater in those relationships that were unstable, but this difference was not statistically significant (unstable relationships $M = 0.84$, $SD = 0.75$; stable relationships $M = 0.57$, $SD = 0.48$), $t(14.79) = 1.40$, $p = .18$. Younger mothers reporting higher levels of anger postpartum, $r(232) = -.18$, $p < .01$. The presence of obstetric complications was not related to maternal anger (no complications $M = 0.56$, $SD = 0.46$; complications $M = 0.63$, $SD = 0.53$), $t(229) = -.95$, $p = .34$, and neither was levels of reported pain during delivery, $\rho(173) = .05$, $p = .48$. As with postpartum depression, total sleep disturbances in the first six months postpartum was related to anger, $\rho = .23$, $p = .001$.

4.3.2 The Association between Anger and Perinatal Depression

4.3.2.1. Antenatal depression and anger. Mothers with antenatal depression reported more anger in pregnancy ($M = 3.24, SD = 1.81$) than those who were not depressed ($M = 1.48, SD = 1.46$), $t(230) = -5.53, p < .001$ ³. This difference is displayed in figure 4.1.

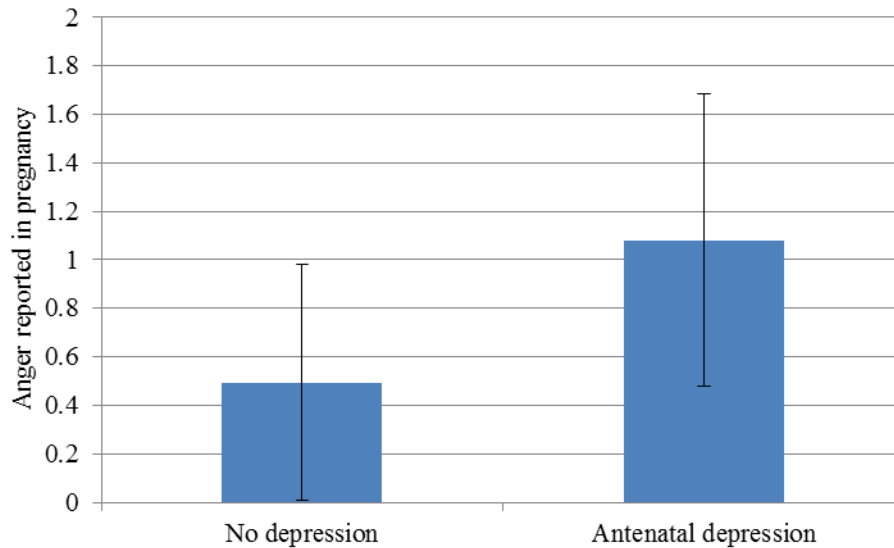


Figure 4.1. Maternal anger reported in pregnancy as a function of antenatal depression status. Error bars are standard deviations.

To test whether the relationship between antenatal depression and mother-reported anger in pregnancy was due to their shared relationship with demographic variables (mothers' age, educational achievement, social class and relationship status) or the planning of the pregnancy (planned vs. unplanned), a linear regression was conducted with these variables entered at the first step. At the first step, mothers' education, $\beta = -.26, t(226) = -3.35, p < .001$, and age at first birth, $\beta = .15, t(226) = 2.13, p = .03$, were the only significant predictors; relationship status, social class and planned pregnancy were no longer significantly related to anger. Antenatal depression, when added at the second step, was a significant predictor of

³ An analysis was conducted to test for an association between pre-childbirth anger and the number of depressive symptoms in the 25 mothers with a diagnosis of antenatal depression. The variables were inversely but not significantly correlated. This suggests anger is not related to depression severity in pregnancy in this sample.

pregnancy-measured anger, $\beta = .26$, $t(226) = 3.88$, $p < .001$. However, mothers' education, $\beta = -.15$, $t(226) = 2.23$, $p = .03$, and age at first birth, $\beta = -.21$, $t(226) = -2.73$, $p = .007$, both remained as significant predictors. This analysis is shown in full in Table 4.1.

Table 4.1

Linear Regression Predicting Mothers' Anger in Pregnancy.

Predictor	ΔR^2	β	$B (SE)$	95% CI for B	
				Lower	Upper
Step 1	.15***				
Maternal age ***		-.26	-0.07 (0.02)	-0.12	-0.03
Less than basic education *		.15	0.65 (0.30)	-0.05	-1.25
Working class		.09	0.30 (0.24)	-0.17	0.76
Unstable relationship		.04	0.28 (0.43)	0.58	-1.14
Unplanned pregnancy		.08	0.26 (0.26)	0.24	-0.77
Step 2	.05***				
Maternal age **		-.21	-0.06 (0.02)	-0.10	-0.02
Less than basic education *		.15	0.66 (0.30)	-0.08	-1.24
Working class		.07	0.22 (0.23)	-0.23	0.67
Unstable relationship		.02	0.13 (0.43)	0.99	-0.73
Unplanned pregnancy		.11	0.38 (0.25)	0.12	-0.87
Antenatal depression ***		.26	1.34 (0.35)	0.66	2.02
Total R^2	.20***				

Note. N=232. CI = confidence interval.

† $p < .10$ * $p < .05$, ** $p < .01$, *** $p < .001$.

4.3.2.2. Postnatal depression and anger. A similar pattern emerged when comparing maternal anger between mothers with and without postnatal depression. Mothers with postnatal depression reported more anger ($M = 3.29$, $SD = 1.98$) than those who were not depressed ($M = 1.51$, $SD = 1.46$), $t(22.23) = -4.00$, $p = .001^4$. Figure 4.2 displays this simple

⁴ An analysis was conducted to test for an association between pre-childbirth anger and the number of depressive symptoms in the 21 mothers with a diagnosis of postnatal depression. The variables were inversely but not significantly correlated. This suggests that, as in pregnancy, anger is not related to the severity of depression in this sample. Therefore, depression severity was not considered further.

mean comparison. Levels of maternal anger were highest when mothers had been depressed at both time points (Figure 4.3).

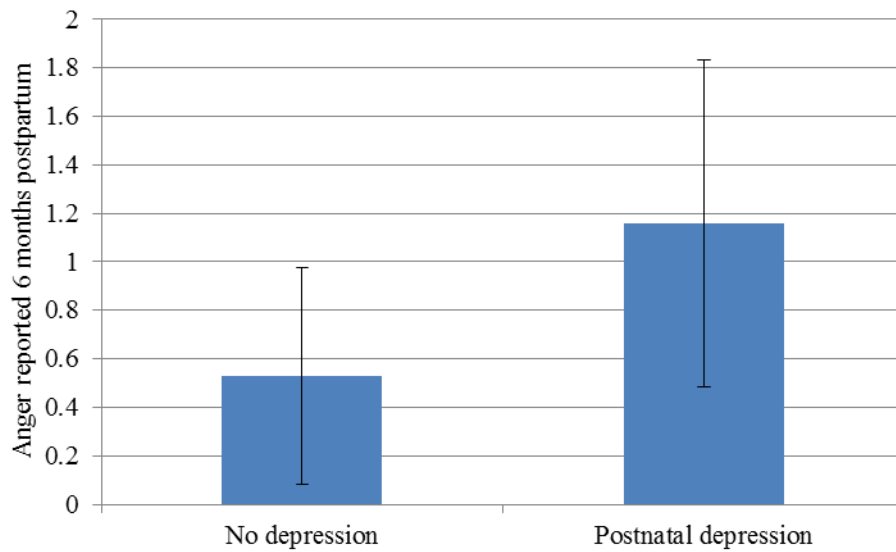


Figure 4.2. Maternal anger at six months postpartum as a function of postnatal depression status. Error bars are standard deviations.

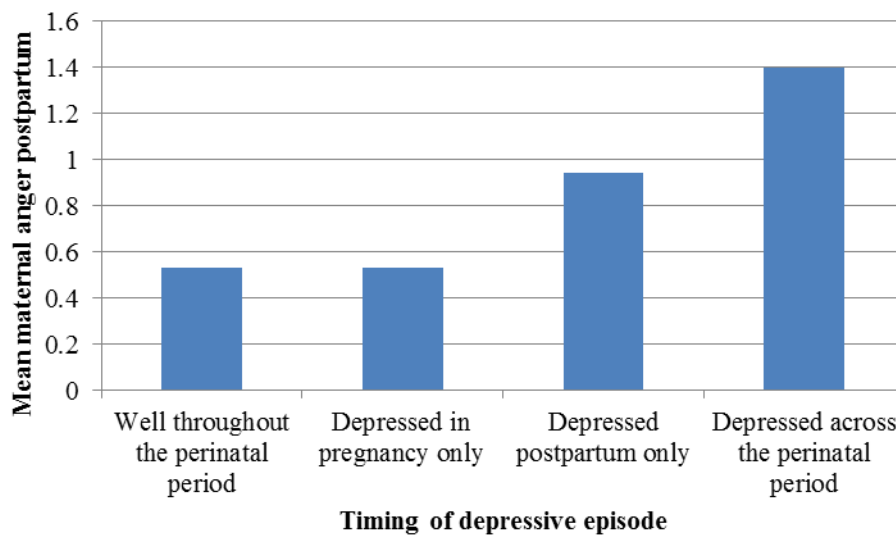


Figure 4.3. Maternal anger at six months postpartum in mothers who were depressed at different time points across both points in the perinatal period.

To test whether this relationship was explained by the shared association that postnatal depression and anger have with demographic factors and sleep disturbances, assessed above, a linear regression was conducted predicting postpartum maternal anger from postpartum depression status controlling for these factors at the first step. The presence of postpartum depression was the only significant predictor of concurrent anger, $\beta = .31$, $t(223) = 3.82$, $p < .001$, presented in step 2.

At step three, pre-childbirth anger was added to clarify the possible causal direction in the relationship between anger and depression. Whilst postpartum depression remained a significant predictor ($\beta = .26$, $t(223) = 3.94$, $p < .001$), pre-childbirth anger was also a significant predictor of postpartum maternal anger ($\beta = .41$, $t(223) = 6.34$, $p < .001$), and the change in R^2 was significantly different from zero. Therefore, it appears that both pre-childbirth anger and postpartum depression are independent predictors of postpartum maternal anger. Indeed, a previous tendency to anger predicts postpartum anger, even when controlling for antenatal and postnatal depression. Likewise, the presence of postnatal depression predicts maternal anger, even when controlling for a past tendency to anger.

Table 4.2

Linear Regression Predicting Maternal Anger at Six Months Postpartum.

Predictor	ΔR^2	β	<i>B</i> (<i>SE</i>)	95% CI for <i>B</i>	
				Lower	Upper
Step 1	.09**				
Maternal age		-.09	-0.02 (0.02)	-0.07	0.02
Less than basic education		.05	0.19 (0.31)	-0.43	0.80
Working class		.00	-0.01 (0.24)	-0.48	0.46
Unstable relationship		.04	0.24 (0.44)	-0.64	1.11
Unplanned pregnancy		-.02	-0.08 (0.26)	-0.59	0.44
Antenatal depression †		.13	0.63 (0.37)	-0.10	1.35
Sleep disturbances *		.17	0.61 (0.24)	0.15	1.08
Step 2	.07***				
Maternal age		.10	-0.03 (0.02)	-0.07	0.02
Less than basic education		-.02	-0.07 (0.31)	-0.67	0.54
Working class		.03	0.08 (0.23)	-0.37	0.54
Unstable relationship		.04	0.26 (0.43)	-0.58	1.11
Unplanned pregnancy		-.02	-0.06 (0.25)	-0.56	0.43
Antenatal depression		.02	0.10 (0.37)	-0.63	0.84
Sleep disturbances		.11	0.38 (0.23)	-0.08	0.84
Postpartum depression***		.31	0.61 (0.37)	0.88	2.33
Step 3	.13***				
Maternal age		.03	0.00 (0.01)	-0.01	0.02
Less than basic education		.04	0.06 (0.09)	-0.13	0.24
Working class		-.03	-0.03 (0.07)	-0.17	0.11
Unstable relationship		.05	0.10 (0.13)	-0.16	0.36
Unplanned pregnancy		.04	0.05 (0.08)	-0.11	0.20
Antenatal depression		-.01	-0.01 (0.11)	-0.24	0.21
Sleep disturbances		.08	0.09 (0.07)	-0.05	0.23
Postpartum depression***		.26	0.45 (0.11)	0.22	0.67
Pre-childbirth anger***		.41	0.21 (0.03)	0.14	0.27
Total R^2	.29***				

Note. N=232. CI = confidence interval.

† $p < .10$ * $p < .05$, ** $p < .01$, *** $p < .001$.

4.3.3 Predicting Postnatal Depression from Anger in Pregnancy

A Fisher Exact Test revealed that antenatal depression was related to postpartum depression within individuals, $p < .001$. Of the 25 mothers depressed in pregnancy, 10 (40%) remained depressed postpartum. The remaining 15 were not depressed. After birth, 11 mothers who had not been depressed in pregnancy reported a depressive episode (5.3%). A total of 196 mothers were not depressed at either time point.

With the knowledge that depression in pregnancy is the most consistent predictor of depression postpartum explored in previous research, the contribution of pregnancy-measured anger to this equation was next considered. With postnatal depression diagnoses as the dependent variable, a binary logistic regression was conducted to test for the predictive power of maternal anger in pregnancy. Maternal age and the categorical predictors of stable relationships and educational attainment were entered as control variables at the first step. Alongside these control variables, mothers' antisocial history and whether the pregnancy was planned were also added. Furthermore, mother's previous diagnoses of depression both in pregnancy and prior to pregnancy were controlled for, to remove any variance explained by a previous history of depression. At the second step, mother's anger in pregnancy was entered as a predictor, to test whether any additional variance in postpartum depression diagnoses was explained by this variable. Table 4.3 shows the results of this analysis.

At the first step, the only significant predictor of postnatal depression was depression in pregnancy, Wald statistic = 3.38, $p < .001$, OR = 9.01, CI [2.52, 32.25]; when considered without anger, a diagnosis of depression in pregnancy increased the risk of postpartum depression 9 fold. Furthermore, although educational attainment showed a slight trend towards significance ($p = .09$), no other variable provided any unique prediction of postpartum depression.

When pregnancy measured maternal anger was entered at the next step, it too was a significant predictor of postpartum depression, even after controlling for antenatal depression, Wald statistic = 2.13, $p < .05$, OR = 1.40, CI [1.03, 1.92]. The level of anger in pregnancy was a significant risk factor for the onset of depression postpartum. Although antenatal depression remained an important predictor, the odds of postpartum depression attributed to depression in pregnancy reduced from 9.01 to 6.09, Wald Statistic 2.70, $p < .01$, OR = 6.09, CI [1.63, 22.75].

Table 4.3

Logistic Regression Predicting Postpartum Depression.

Variable	<i>B</i>	<i>SE</i>	χ^2	Exp(B)	95% CI for Exp(B)	
					Lower	Upper
Step 1						
Maternal age	0.04	0.05	0.49	1.04	0.94	1.15
Less than basic education	1.08	0.63	2.95	2.95	0.86	10.12
Unstable partnership	0.37	0.85	0.19	1.45	0.27	7.76
Antenatal depression***	2.20	0.65	11.40	9.01	2.52	32.25
Prior depression	0.69	0.54	1.62	1.99	0.69	5.74
Unplanned pregnancy	0.21	0.63	0.11	1.23	0.36	4.18
Antisocial history	0.11	0.08	2.22	1.12	0.97	1.29
Step 2						
Maternal age	0.04	0.05	0.71	1.05	0.94	1.16
Less than basic education	0.88	0.66	1.75	2.40	0.66	8.79
Unstable partnership	0.22	0.90	0.06	1.24	0.21	7.27
Antenatal depression**	1.81	0.67	7.20	6.09	1.63	22.75
Prior depression	0.62	0.56	1.26	1.86	0.63	5.53
Unplanned pregnancy	0.35	0.64	0.30	1.42	1.03	4.95
Antisocial history	0.56	0.08	0.50	1.06	0.91	1.23
Anger in pregnancy*	0.34	0.16	4.49	1.40	1.03	1.92

Note. R^2 at step 1 = .12 (Cox & Snell) .27 (Nagelkerke). R^2 at step 2 = .14 (Cox & Snell) .31 (Nagelkerke). * $p < .05$, ** $p < .01$, *** $p < .001$

4.4 Discussion

The first hypothesis that women with antenatal or postnatal depression may report more anger than those who were not depressed was supported. Indeed, the reported levels of anger in pregnancy were on average twice the amount in mothers with antenatal depression compared to those who were well during their pregnancies. Although antenatal depression was the strongest predictor of pregnancy-rated anger, anger was also predicted by mothers' age and educational attainment; younger mothers and those with less than basic education reported greater anger in pregnancy, and this relationship was not explained by their shared association with antenatal depression.

A similar pattern was noted in the postpartum months. Again, mothers with postpartum depression reported levels of anger that were twice as great on average that those who were well throughout the first six months. The relationship between depression and anger was clearer at this time; postpartum depression was the only significant predictor of anger when all other measured variables were included. Mothers' age, education, antenatal depression or concurrent sleep disturbances were not significant predictors. Interestingly, before postpartum depression was added as a predictor, the presence of sleep disturbances after the birth of the baby was the only significant predictor. However, this relationship was no longer significant once postpartum depression was accounted for. Thus, mothers who are depressed report more anger than those who are well, both during pregnancy and post partum.

Anger remained significantly related to depression in the perinatal period with respect to the second consideration of this chapter: the prediction of postpartum depression from anger in pregnancy. Although – in keeping with previous research - antenatal depression remained the strongest predictor of postpartum depression. Maternal anger in pregnancy also displayed a significant association with postpartum depression. Indeed, maternal anger in pregnancy remained a significant predictor of postpartum depression, even when controlling

for antenatal depression, depression prior to pregnancy, and mothers' antisocial history. At the very least, this suggests anger and depression are related across time.

The results of the contemporaneous analyses lend further support to the notion that depression and anger are linked, and extends this known association to include the perinatal period, and perinatal depression. A number of potential explanations for this association have been introduced. Firstly, like anger, sadness can be triggered when an individual's expectations are not met. Anger may be felt when action may allow the goal to be met, causing a return to equilibrium. Sadness, on the other hand, occurs when no action is possible, leading to helplessness, and potentially to depression. A long period of stress, in which the stress appears uncontrollable, can lead to depression (Seligman, 1975). In that sense, a period of stress, such as the birth of a new baby, can lead to both emotions, depending on the mother's automatic perception of whether the stress is manageable. Indeed, both emotions can co-occur in the same time frame, even if not at the same moment.

Both emotions may, therefore, be heightened in individuals who have a capacity towards negative interpretations, attributions, information, and biases. An individual with depression may be more likely to perceive a difference between what they expect and what they are faced with, and the same process may be true in triggering anger. Whilst anger is first and foremost a common and non-pathological emotion, repeated angry responses may suggest a bias towards attention to and interpretation of negative information (Owen, 2011).

The suggestion that the expression of anger, together with its motivating quality, is a sign of recovery from depression (Weissman et al., 1973) is not supported here. The ten mothers who were depressed at both the pregnancy and postpartum time points were in fact those who reported the most anger postpartum. This suggests that depression of greater chronicity (although not confirmed to be meeting the criterion for chronic depression

according to DSM-IV) is coupled with the greatest reported anger. This seems counterintuitive to the hypothesis that anger is a sign of wellness.

The data contained in this chapter also suggest a somewhat bidirectional pattern of causality between depression and anger. In the prediction of postpartum depression (figure 4.3), maternal anger and antenatal depression were important predictors; both remained significant whilst controlling for the influence of the other. When predicting postpartum anger in a similar model (figure 4.2), both maternal anger and postpartum depression were again significant predictors. This suggests a bidirectional relationship whereby anger predicts depression, and depression predicts anger. Indeed, perhaps the association between anger and depression may be further explained by a general disposition to high emotionality, or to a lack of social desirability bias in the informant. Further research is required to explore these alternative hypotheses.

As well as the bidirectional associations between anger and depression when measured concurrently, and across time, these data also lend support to the notion that the presence of depression is not simply explaining anger. They are somewhat separate constructs. Despite the significant association between depression and anger in pregnancy, as demonstrated by the increased incidence of anger in mothers with depression in pregnancy compared to those who were well, anger and depression independently predict depression postpartum. If the effect of anger were to disappear once antenatal depression was controlled for, the alternative conclusion that measured anger was simply the manifestation of depression would be made. Likewise, both anger and depression remain significant independent predictors when predicting postpartum anger. Thus, anger should be considered both in unison with depression and as a construct in its own right.

A number of limitations to the current data exist, which in turn limit the generalisability of the findings beyond this sample. Firstly, in the subsample of cases used in

Chapter 4, the incidence of depression in the perinatal period, especially antenatal depression, was lower than the national average. Therefore, the effects of antenatal depression may have been underestimated, especially within the analysis of the prediction of postpartum depression. Similarly, the proportion of mothers with more than basic education qualifications was greater than the national average. Therefore, the relevance of these findings to the higher risk group may be limited. Further research exploring the association between anger and depression in these groups would be a useful endeavour. Nonetheless, the findings contained in this chapter are not based on a low risk group; mothers who are depressed antenatally and postnatally and fit the profiles of social risk are included.

To further confirm the relevance of the findings contained in this chapter, additional psychological and situational aspects could be explored as explanations for and mechanisms behind heightened anger in the context of perinatal depression. In terms of situational factors, problems with housing, partners and finance could be explored further. Each of these factors is attributed to depression onset in pregnancy (Kitamura, Shima, Sugawara, & Toda, 1996; Kitamura, Sugawara, Sugawara, Toda, & Shima, 1996; Rich-Edwards et al., 2006). Women who perceive a lack of social support are also vulnerable to depression (Brugha et al., 1982), and conflicted relationships between mothers and their parents are more common in women who become depressed postpartum (Birkeland, Thompson, & Phares, 2005; Caldwell, Antonucci, Jackson, Wolford, & Osofsky, 1997). Further studies that explore the relevance of these situational factors, measuring their shared association with anger and depression, would allow further elaboration of the interplay between these two concepts as documented in this chapter.

Psychological factors may also prove illuminating in establishing the relationships between anger and depression. As mentioned previously, cognitive factors such as negative biases and ruminating tendencies are highly relevant to depression in the perinatal period (O'

Hara, Rehm, & Campbell, 1982; O'Mahen, Flynn, & Nolen-Hoeksema, 2010). These factors are also notable triggers for anger (Owen, 2011; Rusting & Nolen-Hoeksema, 1998). These analyses are beyond the scope of this thesis, but the data here provides the rationale for such investigation.

Together, the results contained within this chapter suggest that the emotion of anger may be worthy of consideration, both within depression, and in its prediction. Indeed, interventions that tackle perinatal depression may be improved by the recognition that anger is a salient emotion in depression, as reported by the mothers and mothers-to-be that comprise the sample employed in this chapter. What is more, the emotion of anger may be a driving factor in the links between perinatal depression and child outcome, especially given the predictive power of perinatal depression for later externalizing behaviour and violence in offspring. Importantly, the relevance of mothers' anger as a factor that is independent of depression may prove to be an interesting endeavour. Although anger was heightened in those mothers with depression, there exists much variation.

CHAPTER 5.

INTERPARENTAL ANGER OVER THE TRANSITION TO PARENTHOOD

5.1 Introduction

This chapter will consider the presence of anger between partners over the transition to parenthood. Extending the findings from Chapter 3, the next set of analyses will establish whether previous anger predicts anger frequency within the parental relationship in the postnatal period. This pattern will be described both for mothers and fathers. Comparisons between mothers' and fathers' experience of anger before and after becoming parents will also be considered. In addition, the analyses will determine whether interparental anger increases over the transition to parenthood.

5.1.1 Past Tendency to Anger as a Predictor of Anger in the Couple Relationship

As described in the previous chapter, an individual's frequency of anger expression shows a significant degree of stability over time. Indeed, some have considered the propensity to anger to be a trait-like concept (Caspi, 1987; Costa & McCrae, 1988). To what extent individual differences in a person's general propensity to anger predicts its frequency in couple relationships is a related topic. Indeed, an angry temperament in childhood predicts later partner conflict and relationship dissolution (Caspi, Elder, & Bem, 1987). Within relationships, one's own anger exerts a significant influence on overall marital satisfaction

(Renshaw, Blais, & Smith, 2010). In a sample of teenage mothers, Jenkins, Shapka and Sorenson (2006) noted a significant association between maternal anger and partner conflict when measured over twelve years, suggesting that maternal temperament is predictive of conflict within relationships over an extended period of time. Exploring the prediction of anger within relationships from past tendencies to anger is a natural step in furthering understanding.

5.1.2 Anger Frequency in Women and Men

Anger between spouses is known to be closely linked (Laughrea, Belanger, Wright, & McDuff, 1997). Indeed, anger is a social emotion that serves a communicative function. Anger does not often elicit a positive emotion in return: anger is often counteracted with anger (Schoebi, 2008). The partner's anger is a key determinant of relationship satisfaction, even after controlling for ones' own expression of anger (Renshaw et al., 2010). As well as similarities in the frequency of anger between partners, researchers have considered the differences between anger as a function of gender. Historically, anger has been regarded as a 'masculine' emotion, whilst its expression has controversially been deemed 'inappropriate' in women (Frost & Averill, 1982; Kopper & Epperson, 1991; Smith et al., 1989; Miller, 1991). However, there is evidence to the contrary, with studies showing either little difference between genders (Deffenbacher et al., 1996), or indeed higher frequencies of anger in women than men (Frost & Averill, 1982). Analyses of a large cohort found that, within relationships, women in partnerships express more anger than men (Ross & Van Willigen, 1996), a finding which has been consistently supported (Funabiki, Bologna, Pepping, & Fitzgerald, 1980; Malatesta-Magai, Shepard, Jonas, & Culver, 1992).

5.1.3 The Experience of Anger in Relationships

In a study assessing the frequency of anger in a sample of students, 80% of experienced anger was targeted at individuals the instigator knew well (Averill, 1982). Indeed, the most intense emotions are often felt within interpersonal relationships. Such emotions interact, with one partner's expression of anger predicting the other's, co-regulating on even a daily basis (Schoebi, 2008). Indeed, partners show more co-regulation with negative emotions than positive (Saxbe & Repetti, 2010), and the degree to which they co-regulate is associated with their marital satisfaction; marital satisfaction buffers the effect of their partners' negative moods on their own. Wives' anger, in particular, has been shown to be more closely affected by their daily perception of the relationship than husbands' anger, which is predicted by their overall perception of the relationship (Sanford, 2005). The majority of research examining anger in marriage, and within the family, is concerned with the prediction of, or association with, adverse outcomes. Little is known, however, about the normative experience of anger in relationships, and even less known about its presence in relationships across the transition to parenthood.

5.1.4 Interparental Conflict over the Transition to Parenthood

The transition to parenthood has long been known to be a challenging experience for couples. The addition of a child to the dyad is accompanied by a significant re-organization of the family (Mattessich & Hill, 1987), involving a number of logistical changes within the parents' relationship. These include a shift in the division of labour, a decrease in shared time between partners, a decline in sexual relations, and disruptions in communication. As a consequence of such changes, research has consistently found a decrease in marital satisfaction over the transition to parenthood (Schulz, Cowan, & Cowan, 2006; Shapiro, Gottman, & Carrere, 2000), and a decrease in marital quality generally (Belsky & Pensky, 1988; Cowan & Cowan, 1988).

As well as a decrease in satisfaction and quality, the transition to parenthood has been suggested to result in an increase of interparental conflict as much as nine-fold (Belsky & Rovine, 1990; Belsky & Kelly, 1994; Cox, Paley, Burchinal, & Payne, 1999; Crohan, 1996; Goldberg & Sayer, 2006; Kluwer & Johnson, 2007), although this conclusion is not always supported (Macdermid, Huston, & McHale, 1990; White & Booth, 1985). Beyond the transition to parenthood, the presence of conflict within couples is normal and unavoidable, and so in considering the noticeable adjustments in lifestyle that are required after the birth of a baby, the potential increase in conflict is somewhat understandable. Couples experience greater differences in their goals and greater disagreements in handling family affairs after the birth of a baby (Tomlinson, 1987). Indeed, behaviours related to conflict may themselves serve a constructive function in aiding parents in overcoming the challenges that a new baby presents (Lazarus, 1991), and avoidance of conflict may convey its own risk both for parents (Gottman, 1994) and their children (Davies, Sturge-Apple, Winter, Cummings, & Farrell, 2006). However, when such conflict is unresolved, extended, or destructive rather than constructive in nature, it has been shown to exert a suboptimal influence on both the parental relationship and the developing child (Cummings et al., 1991). Indeed, research that considers the quality and efficacy of the management of conflict, not just its frequency, offers a more thorough depiction of the pattern of interparental conflict across the transition to parenthood, and the consequences of raised conflict on parents and children.

5.1.4.1 The Measurement of Interparental Conflict

The concept of interparental conflict is not always explicitly defined, and the items that comprise its measurement vary. Whilst some measures focus on the affective element of conflict (e.g. anger), others consider minor disagreements and differences of opinion as indicators of conflict. Some have approached the notion of conflict from a more extreme perspective by including items pertaining to alcohol consumption and violence. Indeed, some

scales incorporate items related to constructive or even depressive conflict (Schudlich et al., 2011).

Investigations into changes in interparental conflict over the transition to parenthood include longitudinal studies measuring change over time, simple comparisons between parents and non-parents, and comparisons of longitudinal change between couples with and without children. Studies that assess change in interparental conflict typically measure behaviour during pregnancy and at least one postnatal time point by questionnaire. A number of such studies have used the conflict subscale from Braiker and Kelly's (1979) four factor scale of intimate relations. This scale contains items directly measuring anger, such as '*how often did you feel angry or resentful toward your partner*' and '*to what extent did you communicate negative feelings toward your partner (e.g., anger, dissatisfaction, frustration, etc.)*?' It also includes three further items related to the frequency of arguments, the seriousness of such arguments, and frequency of attempts to change partner's behaviour, amounting to a scale measuring the amount of overt conflict in the relationship. Belsky and Rovine (1990) measured conflict using this scale at four time points between pregnancy and 36 months postpartum, and observed a linear increase in the wives' estimation of conflict frequency, with no significant change in the husbands' estimation of conflict across the points of measurement. In a small sample of lesbian partnerships, Goldberg and Sayer (2006) observed the same trend of increase in biological mothers, but no change in non-biological mothers.

However, other studies that have adopted the same measure of interparental conflict have found no notable increase across the transition to parenthood in either partner. Interestingly, in a subsample of that employed by Belsky and Rovine (1990), but five years beforehand, Belsky, Lang and Rovine (1985) observed no increase in conflict between

pregnancy and postpartum. However, their smaller sample (61 versus 128) suggests that a certain degree of statistical power may be required to detect change in interparental conflict.

Further research measuring conflict over the transition to parenthood is provided by studies that include a non-parent comparison group in their design. Such designs aim to provide further confidence that the birth of the child is the preceding factor explaining such change, rather than simply an effect of increased relationship length. Crohan (1996) measured the frequency of conflict for both husbands and wives at two time points approximately one year apart. They found overall conflict frequency (the number of conflicts over the past month) had increased significantly in those partners who had become parents. However, when separately assessing constructive versus destructive conflict styles (by analysing behaviours shown by each partner in the most recent occurrence of conflict), the increase remained, but the comparison group displayed a comparable trend; fewer couples were using a constructive style and more couples employed destructive conflict tactics. In a similar design, White and Booth (1985) reported no difference in the increase of conflict over time between parents and non-parents when measured in a large telephone survey. However, both studies' choice of conflict measure reveals inconsistency with other research. The items comprising the destructive measure in Crohan's (1996) investigation included: *threatening, insulting, having the last word, bringing up the past, and yelling*. These items suggest a more extreme display of conflict, one that may extend beyond an expression of anger. Indeed, White and Booth (1985) used items pertaining to excessive alcohol consumption and interpersonal violence, a further extreme indicator in the classification of conflict. Given that the operational definition of conflict can vary substantially, cross-comparison of the literature can be misleading. Thus, conclusions that the birth of a baby does not explain the increase in interparental conflict must be considered with caution.

5.1.5 Interparental Anger over the Transition to Parenthood

In keeping with the overall aim of this thesis, the analyses presented in this chapter focus on the expression of anger between parents, rather than other dimensions of their conflicts. As an element within some measures of conflict, anger is often captured when measurements are segregated into constructive versus destructive types. However, conflict may not always be affectively charged. Indeed, in averaging or summing items such as violence, minor disagreements, and anger, the specific pattern of anger is undoubtedly lost. For these reasons, the expression of anger requires distinct investigation in the context of interparental conflict.

Given the inconsistencies in findings drawn from research regarding the course of interparental conflict over the transition to parenthood, one must be tentative in suggesting a hypothesis regarding interparental anger. Beyond the literature on interparental conflict, however, there remain other aspects of the transition to parenthood that suggest anger may be a pertinent emotion. Firstly, the results contained in Chapter 3 suggest there is a small but significant increase in anger for mothers after the birth of their first child. Indeed, when interviewed about their personal experience of anger, a significant number mentioned that this anger was commonly expressed within their relationship with their infant's father. Secondly, individuals have been shown to experience some of their most intense emotions within their relationships (Berscheid & Ammazalorso, 2004). Therefore, the assumption that this finding may extend beyond general measures of maternal anger to that of interparental anger is a reasonable one. Thirdly, partner anger has been found to be a predictor of marital satisfaction over the transition to parenthood (Simpson, Rholes, Campbell, Tran, & Wilson, 2003), an element of the parental relationship that has consistently been shown to decrease following the addition of a child (e.g. Belsky & Kelly, 1994). Fourthly, given that anger-based marital conflict has been posited as the factor most likely to lead to externalizing problems in children (Jenkins, 2000), a specific understanding

of its course over the transition to parenthood is of considerable interest to the literature on the prediction of child outcomes.

5.1.5.1. Predicting Change in Interparental Conflict and Anger over Time. In addition to investigations into the change in interparental conflict across the transition to parenthood, a number of studies have considered predictors of individual differences in change in conflict over time. Demographic characteristics thought to affect change in conflict include maternal and paternal age (Belsky & Rovine, 1990). Pregnancies that are unplanned have been suggested to result in increase the rate of conflict over the transition (Cox et al., 1999; Belsky & Rovine, 1990). Certain aspects of the relationship as measured in pregnancy are deemed important, such as problem solving style (Cox et al., 1999), relationship quality (Kluwer & Johnson, 2007), relationship length (Belsky & Rovine, 1990) and levels of romance (Belsky & Rovine, 1990). Certain personality-based factors have also been showed to affect the onset of interparental conflict, including neuroticism (Goldberg & Sayer, 2006) and self-esteem (Belsky & Rovine, 1990). Finally, postpartum situational variables, such as imbalances in the division of labour (Belsky et al., 1985, Cowan & Cowan, 1995), less than the expected level of social support (Goldberg & Sayer, 2006), and even the existence of dissonance between mothers' gender role attitudes and her actual experience of the division of labour postpartum (MacDermid et al., 1990) have all been shown to affect the pattern of conflict across the transition to parenthood. Many of these factors may potentially be relevant in charting an accurate depiction of change in interparental anger over the transition to parenthood, and will be considered within this chapter.

Anger has long been linked with age, with higher levels observed at younger ages within adulthood (Spielberger, 1999; Galambos & Krahn, 2008). However, the relationship between interparental conflict change and parental age is not so clear, with some studies finding interparental conflict frequency is unrelated to adult age (Kluwer & Johnson, 2007),

and others finding only the opposing partner's age, but not their own, to be related to their conflict change (Belsky & Rovine, 1990).

Factors related to the relationship between partners, such as type and length, may also be relevant to the frequency of interparental anger. The majority of research concerning interparental conflict considers only married parents (e.g. Belsky, Lang & Rovine, 1983), whilst, in the general population, there are a wider range of relationship types including non-married cohabiting couples, and couples who do not cohabit. It may be that conflict and anger are less frequent in non-married couples as research suggests a general decline in satisfaction post-marriage (Belsky & Kelly, 1994). On the contrary, Brown and Smith (1996) reported less satisfaction in cohabiting couples as compared to married ones, after controlling for relationship length, suggesting this conclusion is not robust. By including a wider range of relationship types in the current study, the data will provide further means to elucidate any differences and similarities between these relationship styles.

A consistent factor that predicts both the amount of interparental conflict post partum, and the rate of change over the transition to parenthood, is division of labour (Belsky et al., 1985; Cowan & Cowan, 1995; MacDermid et al., 1990). As the mismatch between a desired goal and the achievement of such goal is a core trigger of anger, feelings of unfairness in the division of tasks may be particularly relevant to an increase in anger postpartum, especially if the prior expectations of such divisions are not met (MacDermid et al., 1990). The current study will consider parents' relative share of caregiving duties as a predictor of anger, a task that is wholly novel to first-time parents in the postpartum period.

5.1.6 Aims of the Chapter

In this chapter, I will investigate the nature of interparental anger over the transition to parenthood. Firstly, tests of association between interparental anger measured in pregnancy

and the postpartum period will be conducted to assess whether there is a relationship between past anger and the levels of anger experienced after birth.

Second, contrasts between partners' levels of anger will be made across time. This will assess whether there is a difference in anger between men and women before the birth of their first child, and between mothers and fathers six months after the birth.

Third, the contribution of relevant demographic and situational factors to the prediction of postpartum anger will be assessed. These will include demographic factors (age, educational attainment, class), relationship type (married, cohabiting, in a relationship but not cohabiting), length of time lived together, infant gender, the couple's caregiving share, their previous levels of interparental anger, and pre-childbirth anger in the prediction of anger in the postpartum months.

Fourth, a consideration as to any potential change in interparental anger over the transition to parenthood will be made, by comparing scores over time for mothers and fathers. Based on these results, the distribution of such potential change will be described to provide an indication of the prevalence of any increase. Tests of association between mothers' and fathers' change in anger over time will be made to assess whether partners within relationships follow similar or different trends in interparental anger over the transition to parenthood.

5.2 Method

These hypotheses were tested within the CCDS sample. Details pertinent to the subsample of this chapter are described below. The data for the current chapter were taken from the first two waves of the study, the home visits during pregnancy and at six months postpartum.

5.2.1 Subsample of Participants in Chapter Five

The overall participants in the CCDS are described fully in Chapter 2. As the topic of the current chapter is anger between parents, the sample used in the current chapter required participation from both mothers and fathers during the pregnancy and six months postpartum assessments. Furthermore, as the research questions concern the presence of anger within the parental relationship, only those parents in stable partnerships at both time points were included in the analyses. A stable partnership was defined as couples who were either married, cohabiting, or in a committed relationship but not cohabiting. Of the sample of 234 mothers analysed in Chapter 3, 14 were not in stable partnerships at the pregnancy assessment, and a further two by six months postpartum. Therefore, the subsample analysed in this chapter include 218 sets of parents. Two same-sex couples were included in the sample, with the non-biological parent included in the group of fathers. Analyses completed without these two couples revealed no differences in significance, and so they were included in the final analyses.

5.2.2 Procedure

The full details regarding the CCDS procedure are described in Chapter 2; therefore only those aspects that are salient for the present analyses are described below.

5.2.2.1. The antenatal assessment. The first assessment took place during the third trimester of pregnancy, where parents were visited at home. At the pregnancy assessment, both parents-to-be were given a battery of questionnaires, including the items relating to interparental anger and pre-childbirth anger. A freepost envelope was provided with the questionnaires, to provide the most convenience for families. In cases where either parent struggled with reading the questions, a research assistant would help to administer the questionnaire by reading it aloud.

5.2.2.2. Postnatal assessment. The second assessment took place 5-8 months following birth, within the time window for Wave 2. At this assessment, questionnaires were posted before the home visit occurred. Some were completed and posted before the assessment, whilst the majority were either collected during or posted following the home visit. As had been done at Wave 1, help was provided to families who had difficulty completing questionnaires. Both parents' ratings of anger in the context of their relationship were again collected, along with a number of postpartum variables within the hour-long interview with the mother.

5.2.3 Measures

5.2.3.1. Mothers' and fathers' interparental anger. Two items measuring the frequency of overt anger expressions in the parental relationship were taken from the Iowa Family Interaction Rating Scales (Melby, Conger, Ge, & Warner, 1995). Mothers and fathers were asked to rate the frequency with which they expressed anger in the context of their relationship, providing a self-report measure of behaviour (how much they express to their partner), and a measure of their partners' behaviour (how much their partners express toward them). Self-reported anger items included '*How often do you get angry at her/him?*', and '*how often to you shout at her/him because you were upset with her/him?*' Items assessing the ratings of partners' anger were similarly worded: '*How often does your partner get angry at*

you?’ and ‘How often does your partner shout at you because s/he was upset with you?’ The frequencies of the expressions of anger were rated on a 1 to 7 point scale, labelled as *always* through to *never*. Scores were reversed before analysis for the purpose of clarity, with higher scores representing higher frequencies of anger. Scores for these items were obtained during pregnancy and at six months postpartum.

Both the items included in the measure of interparental anger are thought to be closely related to the expression of anger, whilst the remaining two items in the original measure (arguments and criticism) may not necessarily be indicative of expressed anger. Shouting, in particular, is a key element of anger to include, as vocal tone has been suggested to be particularly salient to the recognition of anger (Averill, 1982). Likewise, although arguments may often be characterized as angry, the extent to which they possess this emotional quality cannot be assumed. Similarly, criticism toward a partner may arise from anger, but is not a direct indicator that the emotion did indeed occur.

5.2.3.2. Parental pre-childbirth anger. The measure of maternal pre-childbirth anger was identical to that measured in the previous chapters. A further measure of pre-childbirth anger for fathers was also added, based on the same three anger measures. Two were retrospectively assessed: anger before age 16 and anger in the last five years preceding the pregnancy. The third was a measure of current anger during the pregnancy, created using the mean frequency of three items: *losing temper*, *feeling out of control*, and *feelings of rage*.

5.2.3.3. Time spent caregiving. As part of the interview at six months postpartum, mothers were asked to report the amount of time the mother and father spent in the caregiving role in a typical week. If the caregiving share differed for families each week, mothers were asked to describe the pattern for the previous week. A week was divided into days, and each day into four potential slots (morning, afternoon, evening and night). A percentage of time spent in caregiving was created, for mothers and fathers respectively, relative to the other

partner. For example, if the father provided care in 18 time periods (of the possible 28) and the mother provided care in every time period (28 of 28), the score would be 10 (10 time periods more than the father), and the father's -8 (8 time periods less than the mother).

5.2.3.4. Length of time lived together. Two variables related to the couple relationship were used in the current analysis; relationship status measured at six months post partum, and the number of years lived together. For relationship status, mothers and fathers were divided into the following categories: married, cohabiting, or in a committed relationship but not cohabiting. For years lived together, a simple measure was provided by asking mothers via questionnaire at Wave 1.

5.2.3.5. Demographics. Mothers' and fathers' age, their highest education achievement (dichotomised as either fewer than basic educational qualifications, or having achieved at least basic qualifications, defined as 5 grades A* to C in the national GCSE examinations given at age 16), and social class (defined by occupation) were each collected by questionnaire at the Wave 1 assessment.

5.2.4 Data Analysis

Before testing the hypotheses, the fathers' pre-childbirth anger variable was created using an analysis identical to that used for mothers' pre-childbirth anger in Chapter 3. For the measurement of interparental anger, the mother's and father's agreement between self- and partner rated behaviour was computed, providing an assessment of inter-rater reliability of the interparental anger scores.

Each hypothesis was then tested. Firstly, associations between pregnancy and postpartum measured interparental anger were examined to assess the stability in interparental anger over time, for mothers and fathers separately.

Secondly, contrasts between mothers and fathers' interparental anger at each time point are made. Due to statistical dependence in data obtained from both partners in couple relationships, partner was treated as a within-subjects variable.

To test Hypothesis 3, the associations between the relevant predictors and interparental anger postpartum were examined. ANOVAs, *t*-tests and correlations were used where appropriate. Categorical and continuous variables were then entered into a linear regression, to test for their unique contribution to a joint score of interparental anger (the mean across mothers' and fathers' reports of interparental anger).

To test Hypothesis 4, analyses concentrated on the estimation of change in interparental anger over time. The prevalence of such change was also estimated by the observation of direction of change in scores between the pregnancy and the postpartum period. Finally, the association between mothers' and fathers' pattern of interparental anger change was considered.

5.3 Results

5.3.1 Preliminary Analyses

5.3.1.1. Creating the father pre-childbirth anger variable. Before beginning the analyses, the pre-childbirth anger measure for fathers was created using the three measures of anger over the life course. Measurements of anger were significantly correlated at each time point (see Table 5.1).

Table 5.1

Summary of Intercorrelations, Means and Standard Deviations for Fathers' Pre-Childbirth Anger Items.

Measure	2	3	<i>M</i>	<i>SD</i>	Range
1. Anger before age 16	.53***	.46***	0.48	0.69	0 - 2
2. Anger in the last five years		.34***	0.41	0.57	0 - 2
3. Anger in pregnancy		-	0.52	0.53	0 - 3

Note. Means and standard deviations are calculated from raw scores.

Intercorrelations are reported using transformed scores. $N = 218$.

*** $p < .001$

To create a summary variable of fathers' pre-childbirth anger, a principal components analysis with oblique rotation was conducted on three items measuring anger at different time points: retrospective child anger, anger in the past five years, and anger in pregnancy. The Kaiser-Meyer-Olkin measure verified the sampling adequacy, $KMO = .64$, whilst Bartlett's test of sphericity showed that items correlated sufficiently to allow PCA, $\chi(3) = 126.14$, $p < .000$. The analysis revealed one factor with an eigenvalue above 1 (1.89), which explained 63.14% of the variance. This suggests stability in the frequencies of anger across the points of

measurement. Individual scores resulting from the PCA were used to create the summary variable, pre-childbirth anger, which provides a measure of fathers' anger before birth.

5.3.1.2. Interparental anger: agreement between partners. To test the level of agreement between individuals' ratings of their behaviour and their partners' rating of their behaviour, correlations were conducted for mothers and fathers at both waves. Mothers' and father's ratings of mothers' anger were significantly correlated during pregnancy, $r(183) = .57, p < .01$, and six months postpartum, $r(183) = .60, p < .01$. Mother's and father's ratings of fathers' anger were also significantly correlated during pregnancy, $r(183) = .50, p < .01$, and six months postpartum, $r(183) = .60, p < .01$. Paired *t*-tests between self- and other-rated mother and father anger revealed no statistically significant differences (see Table 5.2), further suggesting both partners are measuring their own behaviour accurately. These findings confirm that using one partner's report is a sufficiently reliable indicator of anger.

To test the accuracy of this agreement further, a correlation between the numbers of years the partners had lived together and their accuracy was calculated. Accuracy was assessed by measuring the difference between self- and other-reported anger for mothers and fathers, at each time point. No correlation was significant, with Spearman's rho correlations ranging from $\rho(183) = -.05$, to $.01, p > .05$. This suggests the agreement between partners was not related to the length of time they had been cohabiting. Owing to partners' high agreement, the mean of self- and partner-rated behaviour was taken at each time point.

Table 5.2

Agreement between Self- and Other-rated Interparental Anger

Interparental anger	Agreement between raters (Spearman's rho)	Difference between raters (t- Test)
Wave 1		
Mother	.57**	-0.81
Father	.50**	0.51
Wave 2		
Mother	.60**	-0.94
Father	.60**	0.26

Note. N = 183.

** $p < .01$

Table 5.3

Descriptive Statistics for Interparental and Pre-childbirth Anger

Variable	<i>M</i>	<i>SD</i>	Range	
			Potential	Actual
Mother's IPA				
Pregnancy	2.64	1.09	1-7	1 - 6.75
Postpartum	2.92	1.1	1-7	1 - 6.75
Father's IPA				
Pregnancy	2.25	0.91	1-7	1 - 4.75
Postpartum	2.46	1.03	1-7	1 - 5.50
Pre-childbirth anger				
Mother	-0.41	0.96	-	-1.23 - 2.25
Father	0.00	1.00	-	-1.16 - 2.71

Note . N = 218. IPA = Interparental anger

5.3.2 Continuity in Interparental Anger from Pregnancy to Six Months Postpartum.

Mothers' ratings of interparental anger in pregnancy showed a significant correlation with that measured at six months postpartum ($r = .69, p < .001$), and fathers' ratings of interparental anger showed the same pattern of continuity ($r = .71, p < .001$). Taken together, these results suggest that pre-childbirth anger is associated with the amount of anger postpartum, for both parents.

5.3.3 Gender Differences in Interparental Anger⁵

A 2 x 2 ANOVA, with time and partner as repeated measures variables, revealed a significant main effect of partner on levels of interparental anger, $F(1, 215) = 103.38, p < .001$. Paired t -tests revealed this contrast between male and female parents was significant at both pregnancy and six months post partum. At pregnancy, mothers showed significantly more anger than fathers, $t(215) = 8.80, p < .001$. This pattern remained true at 6 months post partum, $t(215) = 8.83, p < .001$. The means are presented in Table 5.3.

5.3.4 Predicting the Frequency of Mothers' and Fathers' Interparental Anger Postpartum

5.3.4.1. Demographic factors. A one-way ANOVA revealed a significant difference in postpartum anger between mothers of middle class ($M = 2.32, SD = 0.43$) and working class ($M = 2.46, SD = 0.50$) background, $F(1, 216) = 4.62, p < .03$. The same pattern was evident for fathers. Working class fathers scored higher in interparental anger postpartum ($M = 2.26, SD = 0.52$) than those classed as middle class ($M = 2.12, SD = 0.41$), $F(1, 216) = 4.83, p < .05$. Educational achievement was also related to interparental anger for both parents. Mothers with fewer than the basic qualifications reported less anger ($M = 2.61, SD =$

⁵For the comparison of interparental anger between men and women, the two same-sex couples were removed from the analysis in order to estimate true gender effects.

0.49) than mothers who had acquired basic qualifications or more ($M = 2.34, SD = 0.44$), $F(1,216) = 9.78, p < .05$. Fathers with fewer than basic qualifications also showed greater anger ($M = 2.67, SD = 0.26$) than those who had attained basic qualifications ($M = 2.16, SD = 0.44$), $F(1,216) = 6.77, p < .01$. Age was significantly associated with postpartum interparental anger for mothers, $r(218) = -.31, p < .001$, and fathers, $r(218) = -.29, p < .001$, revealing that younger mothers and fathers reported higher levels of interparental anger.

5.3.4.2. Relationship type and length. For mothers, a one-way ANOVA revealed a main effect of marital status, $F(1,215) = 5.88, p < .000$. Tukey-Kramer post hoc comparisons were employed due to unequal sample sizes. They revealed married mothers ($M = 2.30, SD = 0.43$) reported less anger than mothers in cohabiting couples ($M = 2.49, SD = 0.47$), $p < .001$. Interparental anger in mothers in stable relationships that were not living together did not differ significantly from the other two groups ($M = 2.68, SD = 0.45$). For fathers, the same pattern emerged. Married fathers ($M = 2.08, SD = 0.42$) expressed less anger than cohabiting fathers ($M = 2.34, SD = 0.47$), $p < .001$. There was no significant difference in anger between fathers in a relationship but not living with their partner ($M = 2.42, SD = 0.40$) and either married or cohabiting fathers.

Mothers' interparental anger showed a significant inverse association with the length of the relationship, $r(218) = -.16, p < .02$; the shorter the relationship, the greater the anger. For fathers, a similar pattern was found, $r(218) = -.13, p < .05$.

5.3.4.3 Postpartum factors. The two postpartum factors, infant gender and caregiving share, were next tested for their association with interparental anger for both parents. A 2 x 2 Mixed ANOVA with infant gender as a between-subjects factor revealed no significant main effect of infant gender, $F(1,216) = 1.07, p > .05$. There was no significant relationship between caregiving share and postpartum anger, either for mothers, $r(218) = .00, p > .05$, or fathers, $r(218) = .11, p > .05$.

5.3.4.4. Pre-childbirth anger. Pre-childbirth anger showed a significant association with interparental anger for mothers, $r(218) = .41, p < .05$, and fathers, $r(218) = .32, p < .05$, respectively. Higher reported levels of pre-childbirth anger were related to higher interparental anger post partum.

5.3.4.5. Differential contribution of each predictor to interparental anger at six months post partum. Next, each predictor was entered into a regression to estimate the unique contribution of each variable to the amount of interparental anger post partum. A backward stepwise method was used to reduce the risk of suppressor effects (Field, 2009). For this analysis, the mean of mothers' and fathers' postpartum ratings of interparental anger was entered as the dependent variable.

The regression revealed five significant predictors of joint interparental anger after the child was born: mother's age, father's age, father's education, and both mother's and father's pre-childbirth anger. No other variable made a significant unique contribution to the model. Together, these variables explained 30% of the variance in joint interparental anger. Table 5.4 presents the beta coefficients and confidence intervals for each predictor in the model at each step in the backward stepwise method.

Table 5.4

Stepwise Regression Predicting Joint Interparental Anger

Variable	Step 1		Step 2		Step 3		Step 4	
	β	CI	β	CI	β	CI	β	CI
Mothers' pre-childbirth anger	.28***	(0.31, 0.82)	.28***	(0.31, 0.82)	.29***	(0.32, 0.82)	.29***	(0.33, 0.82)
Fathers' pre-childbirth anger	.19***	(0.12, 0.58)	.19***	(0.12, 0.58)	.19**	(0.13, 0.58)	.19**	(0.13, 0.56)
Father's age	-.20*	(-0.11, -0.01)	-.20*	(-0.11, -0.01)	-.22***	(-0.11, -0.03)	-.23***	(-0.11, -0.03)
Father's education	-.13*	(-3.18, -0.10)	-.13*	(-3.14, -0.13)	-.13*	(-3.14, -0.17)	-.14*	(-3.18, -0.21)
Years lived together	-.09	(-0.17, 0.03)	-.09	(-0.17, 0.03)	-.09	(-0.17, 0.03)	-.12*	(-0.19, 0.00)
Marital status	.06	(-0.13, 0.36)	.06	(-0.13, 0.36)	.07	(-0.17, 0.36)	-	
Mothers' age	-.03	(-0.07, 0.06)	-.03	(-0.07, 0.06)	-		-	
Mothers' education	.00	(-0.72, 0.74)	-		-		-	
R ²	.30		.30		.30		.30	
F	10.63***		12.21***		14.30***		16.95***	

*** $p < .001$, ** $p < .01$, * $p < .05$

5.3.5 Does Interparental Anger Increase between Pregnancy and Six Months

Postpartum?

To assess change in interparental anger for the sample as a whole, scores were subjected to a 2 (gender) x 2 (time) repeated measures ANOVA, with both time and partner entered as repeated measures. There was a significant main effect for time ($F[1, 217] = 26.22, p < .000, \eta_p^2 = 0.11$) and partner ($F[1, 217] = 103.38, p < .000, \eta_p^2 = .32$), and no significant interaction was found ($F[1, 217] = 1.51, p > .05$). Observation of the mean scores for each group revealed a distinct pattern of increase in anger over time for both partners, as displayed in Figure 5.1. The increase in mothers' anger was relatively substantial ($\eta_p^2 = .11$), and was slightly smaller for fathers ($\eta_p^2 = .07$).

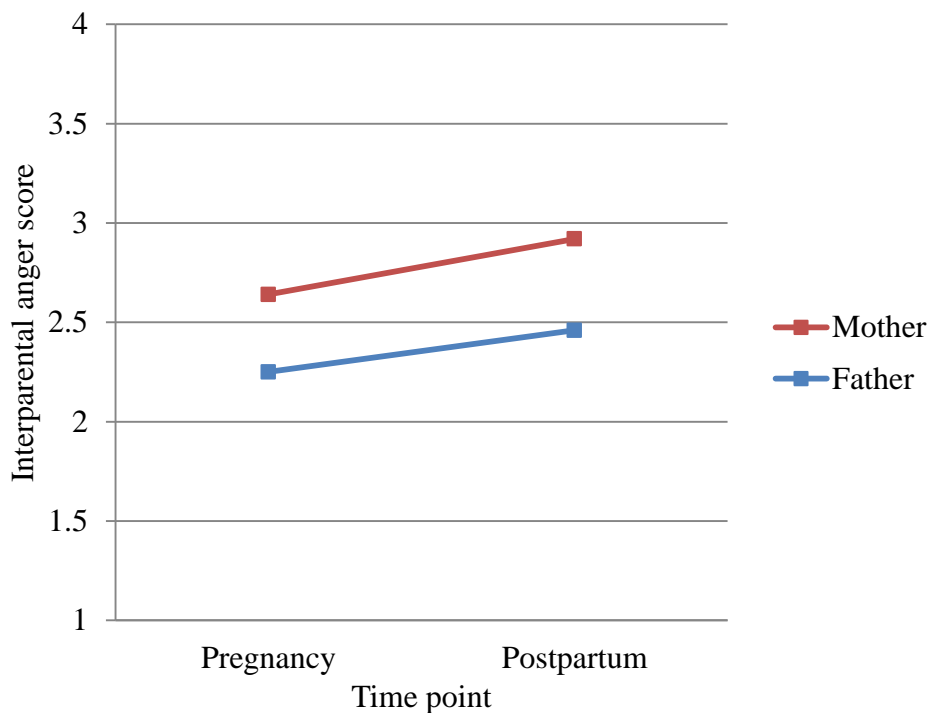


Figure 5.1. Mean interparental anger scores displayed as a function of time and partner.

Next, the proportion of individuals who reported an increase in interparental anger was computed. A difference score was calculated for each individual by subtracting their

score at pregnancy from their score at six months post partum. Subsequently, a positive number suggested an increase in anger, a negative number signified a decrease, whilst zero suggested no change. Approximately half the mothers in the sample reported an increase in anger (55%), whilst fewer mothers (30%) reported a decrease, and even fewer (14%) showed no change in anger over time. A similar pattern emerged for fathers, with half (50%) reporting an increase, around a third (34%) reporting a decrease, and fewer fathers (17%) experiencing no change in levels of anger over the transition to parenthood.

Finally, the association between partners' pattern of change was considered. To test for contrasts between mothers' and fathers' pattern of change, as derived from the preceding analyses, a chi-square test of association was employed comparing mother and father group status. This revealed that mothers and fathers were more likely than chance to follow the same pattern in anger over time, $\chi^2(4, 218) = 56.80, p < .001$. The expected and observed frequencies are presented in Table 5.5. The raw difference scores were then subjected to a paired *t*-test, comparing mothers and fathers. No significant difference between partners was seen; mothers and fathers did not significantly differ in their scores of change, $t(217) = 1.23, p > .05$. These difference scores were then subjected to a Pearson's correlation to test for agreement. A significant association revealed mothers and fathers scores showed similar patterns over time, $r(218) = .58, p < .000$. Together, these results suggest partners in relationships followed similar patterns of change to each other.

Table 5.5.

Crosstabulation of Interparental Anger Change Group Membership

Mother	Father			Total n (%)
	Decrease	No change	Increase	
Decrease	41 (22)	12 (11)	13 (33)	66 (30%)
No Change	14 (11)	8 (5)	9 (15)	61 (14%)
Increase	19 (41)	16 (20)	86 (60)	121 (56%)
Total n (%)	74 (36%)	36 (17%)	108 (50%)	

Note. Unless specified, expected counts are displayed in parantheses.

5.4 Discussion

The first hypothesis concerned the stability of expressed anger over the transition to parenthood in women and men. Supporting the results of the previous chapter, levels of anger between time points showed high association, providing further evidence for individual stability in the experience of anger across time. The data in this chapter extend this finding to fathers, and to anger measured specifically within the couple relationship.

The analyses in this chapter also considered the comparison of reported anger between women and men, both in pregnancy and at six months postpartum. Women consistently reported higher anger than men over time. This finding coincides with previous research that suggests anger is more frequently reported in women (Frost & Averill, 1982; Funabiki et al., 1980; Malatesta-Magai et al., 1992; Ross & Van Willigen, 1996).

However, there was also high agreement between partners levels of anger, with men's' and women's' anger correlating significantly within relationships. In sum, individuals with the highest levels of anger also had partners with the highest levels. This supports previous research that postulates the similarity between spouses' anger (Laughrea et al., 1997; Schoebi, 2008).

By measuring levels of anger in partners at the postpartum period and a number of related factors, the data offered an opportunity to screen for predictors of interparental anger at six months postpartum. Fathers' age and education were both significant predictors, with relationships including younger and less educated fathers expressing the highest levels of interparental anger. Young mothers, and mothers with less education, also expressed the most interparental anger postpartum. Relationships in which the partners were cohabiting but unmarried, as compared to those cohabiting and married, reported higher levels of interparental anger postpartum. In addition, the length of the relationship provided a unique

contribution to the prediction of postpartum interparental anger; those in shorter relationships displayed the most anger. Both parents' levels of pre-childbirth anger were consistent predictors of interparental anger postpartum, where high pre-childbirth anger was associated with the highest interparental anger scores, lending further support for the stability of anger across time.

With respect to the final question, the change in interparental anger over time, the data revealed that interparental anger was greater following the birth of the baby than during pregnancy. This pattern was evident for both mothers and fathers. More parents increased in anger than decreased, whilst a small minority showed no change over time. Indeed, 56% of mothers displayed an increase in their levels of anger, whilst 50% of fathers followed the same trend. Indeed, the direction of change was similar within relationships; mothers who had increased in anger were likely to have partners who also increased.

In summary, the data suggest both stability and change in interparental anger across the transition to parenthood, with a small but significant difference between genders in frequency of anger, but not in the rate of change.

Interpretation of the basic descriptive data provides interesting information regarding the expression of anger in relationships across the perinatal period. The majority of partners report a minimal level of anger, endorsing that they express anger 'some of the time' to their respective partner. A minority report expressing no anger at all. However, some report 'almost always' expressing anger to their partners. Whilst there is evidence that a certain level and quality of conflict and anger can be adaptive in overcoming challenges (Lazarus, 1991), unresolved and repeated conflict can exert deleterious influences on the relationship and developing child (Cummings et al., 1991; Cummings et al., 2007). Importantly, the frequency of parents' shouting alone is a significant predictor of externalizing behaviour in children (Jenkins & Smith, 1991). Given the inclusion of a measure of shouting in the current

data, and the finding of an increase across the transition to parenthood, the data highlight the importance of the postpartum months in the consideration of infant development.

Furthermore, the close association between anger frequency and marital satisfaction previously reported (Simpson et al., 2003) suggest this increase in anger may be instrumental in the decrease of satisfaction reported across the transition to parenthood in previous studies (Schulz et al., 2006; Shapiro et al., 2000). Alternatively, the decrease in satisfaction may trigger the increase in anger. Further research to disentangle these effects would provide an opportunity to investigate the direction of this proposed relationship.

In concentrating on interparental anger alone, the current data provide a description of the course of one aspect of the parental relationship that is likely to be affected across the transition to parenthood. For a full interpretation of this process, future studies should measure other elements of relationship conflict and satisfaction in unison. Indeed, for a number of couples, the transition to parenthood seemed to alleviate anger; 30% of mothers and 34% of fathers reported a decrease in anger after the birth of their first child. An investigation into the potential buffering effects that protect these couples would be an interesting avenue for future research. Potential protective factors may include healthy communication styles, longer relationships, planned pregnancies, social support, and a host of other variables. An exploration of this converse effect may also be informative for future intervention work for the benefit of those parents who report the greatest increase in anger after the birth of their first child.

A limitation of the current dataset is the reliance on two time points for the measurement of interparental anger. Because conclusions regarding predictors of change require at least three measurements points to be robust (Bryman & Hardy, 2004), an exploration of interparental anger across the same transition, but incorporating more measurements, would be a natural step in furthering knowledge. Indeed, there may be some

couples who initially increase in anger post-birth, but quickly adapt and desist. Conversely, others may continue to increase in anger over time. Conceptualising groups using a methodological approach such as this would prove highly informative. Although the data in this chapter do not allow such analyses, they do provide novel evidence supporting a rationale for such an investigation.

CHAPTER 6: THE PREDICTION OF INFANT AND TODDLER ANGER

6.1 Introduction

In the preceding three chapters, anger has been introduced as a salient emotion in the transition to first time parenthood for both women and men. There is a body of literature suggesting that the presence of anger in the home is of consequence for the developing infant, especially when considering the beginnings of its expression are emerging during these formative years. In the current chapter, research into the direct links between the variables introduced in the preceding chapters and infant anger will be investigated. Research regarding the potential links between maternal and paternal anger, perinatal depression, interparental anger, and infant anger, will be presented. First, to introduce this body of analyses, literature regarding the development of anger in infancy will be summarised, concentrating on why early infancy may be a particularly pertinent time point in the development of anger. Next, the rationale for the inclusion of maternal anger and interparental anger, plus the need to consider the influence of perinatal depression, in the prediction of infant and toddler anger will be discussed.

6.1.1 The Development of Infant Anger

There is literature regarding the development of anger in infancy, of which the majority concentrates on charting the age at which anger may be first expressed. The differential emotions theory (Izard, 1997; Izard, 1991; Izard & Malatesta, 1987) supports the notion that discrete emotions, such as anger, develop along their own individual maturational timetables. This view contrasts the theory previously held by developmental psychologists, who posited that negative emotions evolve from an undifferentiated beginning, whereby a global expression of distress branches into the separate emotions of sadness and anger at a later stage in development (Bridges, 1932; Sroufe, 1996). To briefly summarise this literature, there are three main elements that give evidence that anger, specifically, is observable from early in infancy. Firstly, researchers have observed infants displaying anger vocally from as young as 2 months (Moscardino & Axia, 2006), and the facial frown consistent with anger from one month after birth (Emde, Gaensbauer, & Harmon, 1976). Observations of anger-specific behaviours that are universally recognised provide evidence that anger, and not just global distress, is present in infancy.

A number of approaches have been applied to measure anger expression in infants, most of which involve an experimentally induced violation of an expected outcome. Like the triggers of adult anger, experimentally-induced anger in infancy follows an analogous pattern, for example: by restraining their arms (Potegal, Robison, Anderson, Jordan, & Shapiro, 2007; Stenberg, 1982), removing an object from their grasp (Stenberg, Campos, & Emde, 1983), limiting facial expressions in the mother in the still-face paradigm (Lewis & Ramsay, 2005), an extinction paradigm (Lewis, Sullivan, Ramsay, & Alessandri, 1992)(Lewis, Sullivan, Ramsay, & Alessandri, 1992), or recording their responses to pain (Izard, Hembree, & Huebner, 1987). In the commonly used arm-restraint paradigm, Stenberg (1982) observed anger expressions in infants of four-months of age. At seven months, infants

display an angry reaction when a teething biscuit is removed from their grasp (Stenberg et al., 1983). Experiments such as these involve an expectation or goal (to move the arms freely, or to eat the biscuit) and a violation/blocking of that expectation/goal (the arms do not move, and the biscuit is no longer available). As discussed earlier in this thesis, anger serves to motivate action with an aim to overcome an obstacle, and complete the expected goal. As further evidence for the development of anger in infancy, infants at around six months begin to recognise the link between action and outcome, or develop means-end understanding (Piaget, 1952). Therefore, they possess the capacity to recognise how their own action is linked to their desired outcome. This forms the second piece of evidence that the genesis of anger lies in early infancy; not only are the expressions similar to adults' expressions of anger, the triggers are also analogous with those that trigger adult anger.

The observation of individual differences in anger in infancy, the stability of such differences over time, and their association with later behaviour, form the third piece of evidence to suggest infant anger is worthy of study. Research has found stable individual differences in anger in infants from 2 months of age, and that these differences predict levels of anger two months and six months later (Lewis, Alessandri, & Sullivan, 1990). Anger in infancy has also been shown to relate to later behaviour. Indeed, dysregulated anger when measured in two-year-olds is particularly predictive of later behaviour problems (Cummings, Pellegrini, Notarius, & Cummings, 1989), and excessive anger at two years of age predicts increased risk of psychopathology at five and six years of age. Infant anger in response to goal blockage measured at 5 months has also been shown to predict persistence and determination by toddlerhood and antisocial behaviour in later childhood in those who displayed an insecure attachment style in infancy (Sullivan, 2007).

Recently, research by Lewis and colleagues (Lewis & Ramsay, 2005; Lewis, Ramsay, & Sullivan, 2006; Lewis et al., 1992; Sullivan, Lewis, & Allesandri, 1992) has led to the

conclusion that anger is expressed even earlier in infancy under certain conditions. However, a definitive consensus between researchers that anger is truly an emotion that infants have a capacity to express naturally comes mid-way through the first year of life. At this point, the predetermined facial expressions of anger merge with other aspects of expression to form a holistic display of anger. For example, at four months of age, the gestural components of anger, such as hitting out or becoming tense, begin to become co-ordinated with the earlier developing facial expressions of anger (Fisher, Shaver & Carnochan, 1990). By five or six months of age, infants learn to control their arms (Braungart-Rieker & Stifter, 1996; Camras, Oster, Campos, Miyake, & Bradshaw, 1992). Indeed, it is argued that only by six-months have infants begun to express distinctive signs of anger (Stenberg, Campos, & Emde, 1983). This holistic approach informs the measure of infant anger employed in the current chapter, rather than the fine-grained perspective offered by the MAX or AFFEX measures (Izard, 1983; Izard, Dougherty, & Hembree, 1983). Furthermore, parents are arguably best placed to rate individual differences in infant behaviour, with a multi-informant measure ensuring a reliable estimation of behaviour. Indeed, although infants may be capable of expressing anger at earlier than six months in experimentally induced conditions (Lewis, Alessandri, & Sullivan, 1990), six months of age is the most developmentally appropriate time point when anger is to be rated by untrained observers, who are able to draw upon facial expression, vocal responses, and gestural components, to inform their estimations.

6.1.2 The Prediction of Infant Anger

After establishing the presence of anger in infancy, a natural next step involves the measurement of individual differences in anger, and subsequently, the prediction of these differences. One potential predictor of infant anger is the emotional climate of the environment in which they develop, a characteristic that varies considerably between families

(Dix, 1991). Emotions in infancy are a crucial communicative tool, where infants use parents' emotions to guide their behaviour in the short term (Feinmann, 1992), and their reactions to their parents' emotions predict their ultimate socio-emotional development (Eisenberg, Cumberland, & Spinrad, 1998). It seems the capacity for infants to discriminate between anger and other emotions in others exists from very early in infancy. At 10 weeks, infants react differentially to their mothers' facial expressions of anger than to other negative and positive emotions (Haviland & Lelwica, 1987). By seven months, this pattern of behavioural responding is supported by measurement at the neural level; differences in event-related potential responses to fear and anger are notable, with increased responding to the angry expression in particular (Kobiella, Grossman, Reid, & Striano, 2008). This suggests that infants may devote more attention to anger than to fear. In their theory of emotional development, Eisenberg and colleagues (1998) suggest one of the fundamental means by which propensities to certain emotions develop in early childhood is through parents' expression of emotion (together with parents' discussion of emotion and their reactions to their child's emotion), and this theory can be applied to each emotion specifically. For the case of anger, the current chapter concerns the impact that maternal and paternal expressions of anger may have on their infants' own expressions of anger. Furthermore, this will be explored within the contexts of perinatal depression and interparental anger

6.1.2.1 Maternal anger. As well as the observation that infants possess the capacity to recognise emotions, further research has shown that the emotional quality of mother-child interaction is related to child behaviour. In an observation of a small sample of adolescent mothers, Crockenberg (1987) found that maternal anger expression was directly related to later child anger at two years of age. As a direct measure of observed anger in a low risk sample, Denham (1993) assessed the capability of children to react differentially to a variety of emotion displays in mothers. Two-year-olds were found to engage in a bidirectional

dialogue with their mothers, the quality of which predicted child competence in a social task when the mother was absent. Importantly, the infants were seen to respond differentially to maternal happiness, anger, tenderness, and neutral displays. Furthermore, mothers tended to respond to child anger with anger, and specifically, mothers' responses to infant anger were the biggest predictor of later child competence. This suggests mothers' expressed anger is linked with their infants' own expression of anger, and is meaningful for the later development of social understanding in toddlerhood.

The relevance of maternal anger to the development of later externalizing behaviours (which may include anger) has been suggested to occur even earlier in life. In one example, Crockenberg, Leerkes and Barrig Jo (2008) employed a low risk sample of mother-infant dyads to investigate the role of maternal trait anger in the development of child externalising problems. Trait anger levels determined the response of the mother to their infants' frustration as induced using the arm restraint and toy removal tasks. High trait anger mothers were more likely to encourage their six-month-old infant to look at the frustrating event, whilst other mothers encouraged their infants to turn away. In turn, infants who attended to the frustrating event were more likely to show aggressive behaviour two years later, but only if their mothers had encouraged such behaviour. This suggests not only that the level of anger in mothers differentially affects their interactive behaviours with infants, but that such behaviour in turn shapes developmental pathways to infant externalising behaviours. However, as maternal trait-anger measured two years after the infant measure, the association between maternal trait-anger and infant outcome concluded here should be tentative.

In addition to the research on maternal anger in low risk samples described above, there exists a wealth of literature that considers the presence of anger in its extreme manifestation. Research on this subject has concentrated on measures that differentiate parents who are at risk for child physical and verbal abuse and those who are not. Crucially,

parental verbal and physical abuse has shown a direct link with later anger that extends to adulthood (Teicher, Samson, Polcari, & McGreenery, 2006). Furthermore, the division between these groups has commonly been defined by differences in anger levels (Wilson, Rack, Shi, & Norris, 2008).

In an observational design, Cerezo, Pons-Salvador and Trenado (2008) measured interactive behaviours using a sequential coding system with infants of 3, 12 and 15 months of age. They found mothers who were at risk for physical abuse displayed more mixed affectionate-intrusive behaviours, defined as evidence of intruding on the infants' space or presenting developmentally inappropriate toys, when responding to difficult behaviour in the infant, such as crying. Although anger expressions were not directly measured, the intrusive aspect of the behaviours has been linked with elevated anger levels by others (Szabo et al., 2008). Indirectly, this finding suggests high levels of anger are associated with an intrusive behavioural style, which is observed in mothers with elevated risk for child physical abuse. Indeed, when measuring anger directly, maternal trait-anger has been shown to mediate the relationship between depression and escalated physical discipline in mothers from economically disadvantaged background (Shay & Knutson, 2008). This further supports the rationale for considering the role of maternal anger in interaction with infants as, together, this research suggests that maternal anger itself may play a significant role in the association between physical abuse and child anger.

In comparison, few studies have assessed the potential role of the father's anger to the developing infant. There are three potential ways in which fathers' anger may influence infant anger: genetically, indirectly via assortative mating with mothers, and via environmental influence. With view to the first point, very little research regarding the genetic impact of fathers' anger on infant outcome has been considered and is outside the remit of the current discussion. Secondly, women may be more likely to choose partners that

express similar levels of anger to them, and vice versa. This pattern has shown to be the case when considering anti-social behaviour (Galband du Fort, Boothroyd, Bland, Newman, & Kakuma, 2002; Krueger, Moffitt, Caspi, Bleske, & Silva, 1998), and appears to be true for the partnerships in the CCDS in the case of anger (see chapter 5). In this way, father's anger is expected to be indirectly related to infant anger via maternal anger. Thirdly, a direct effect of paternal anger could be noticeable in the context of parenting, and of father-infant interaction. Some have suggested that fathers are more likely to express anger than mothers (Chaplin, Cole, & Zahn-Waxler, 2005) as they often fulfil the disciplinarian role (Lewis & Lamb, 2003). Indeed, in a sample of Taiwanese adolescents, father-child conflict had a greater impact on psychological maladjustment than mother-child conflict (Yeh, Tsao, & Chen, 2010). Clearly, the inclusion of fathers' anger as a potential predictor of infant anger offers an interesting avenue of investigation, in an area with little existing research.

6.1.2.2 Maternal perinatal depression. A considerable amount of research has assessed the link between mothers' depressive symptoms and the accompanying heightened risk for adverse outcomes in children. Moreover, due to the links between maternal perinatal depression and anger documented in Chapter Four, maternal mental health may be a particularly important variable to include in the prediction of infant anger. Attempts to document the exact method of transmission between maternal depression and infant outcome have been suggested. Specifically, distinctions are made between withdrawn and intrusive maternal behaviours; each presenting quite opposing interaction styles and causing varying infant outcome. For example, Diego, Field, Jones and Hernandez-Reif (2006) found the intrusive style resulted in a right frontal EEG shift in the infants by six months, with withdrawn behaviour leading to an opposing left frontal shift. Indeed, the maladaptive intrusive style of parenting often witnessed in mothers with depression is characterized by anger and irritation directed at an infant (Szabo et al., 2008).

The link between parent and child psychopathology may be driven by the negative emotional climate that mothers with depression present to their children. Cohn, Campbell, Matias and Hopkins (1990) measured maternal behaviours to rate positive to negative interaction styles. A display of negative behaviour was defined as a facial or vocal expression of anger, sadness, irritation, intrusive handling or disinterest. Mothers with depression were found to display more of these negative behaviours with their 9-week-old infants than those who were not depressed. Furthering this finding, Mantymaa and colleagues (2004) conducted a longitudinal study assessing the effects of mother-infant interaction at 8 to 11 weeks of age on behavioural and emotional problems in toddlers, within the framework of parental mental health. The nature of the interactions as early as two months of age were associated with an adverse emotional outcome for the infant two years later. Specifically, the toddlers of mothers who showed hostility and intrusiveness during infancy were more likely to have emotional problems.

In a further sample of depressed mothers, Field et al (2005) assessed levels of anger and anxiety. When their infants were three months of age, the mothers with high anger showed less smiling, less exaggerated faces, less game playing and less imitation. Mothers with anxiety and depression showed a similar yet less extreme set of behaviours. The infants of mothers with co morbid anger and depression, however, seemed affected on a greater number of behaviours than the infants of mothers with co morbid anxiety and depression. They showed less smiling, vocalizing and imitating, but more motor activity, distressed facial expressions, gaze aversion and crying.

Maternal antenatal depression is thought to be one of the strongest predictors of postnatal depression (Milgrom et al., 2008), suggesting antenatal depression may at least have an indirect effect on infant outcome through its association with subsequent episodes. However, antenatal depression has also been shown to exert its own unique influence on

children's developing emotionality and behaviour. Indeed, infants of mothers who were depressed in pregnancy are more likely to show less responsiveness to stimulation, disorganized sleep, as well as increased negative affect in infancy (Huot, Brennan, Stowe, Plotsky, & Walker, 2004), externalizing and internalising symptoms at 14 months of age (de Bruij, van Bakel, & van Baar, 2009) and externalizing behaviours at 5 and 9 years of age (Luoma et al., 2004; Luoma et al., 2001). Field (2011) has suggested that maternal anger may be a potentially important confounding variable in the association between antenatal depression and infant/child outcome. Indeed, such a connection may be especially salient in the prediction of anger in infants.

6.1.2.3 Interparental anger. In a separate set of studies, the association between interparental conflict and child outcome has been addressed. Infants are more likely to be exposed to parental conflict than older children (Fantuzzo, Boruch, Beriama, Atkins, & Marcus, 1997). This may be explained by higher levels of parental conflict at this young age (Belsky & Rovine, 1990), and the assumption that parents' expression of conflict may not influence their children in the infant years. Indeed, parents' everyday conflicts are more likely to be expressed negatively when their child is present (Papp, Cummings, & Goeke-Morey, 2002). Infants may be particularly susceptible to the effects of marital conflict; it is a sensitive period for emotional development (Sroufe, 1996; Sroufe & Rutter, 1984), when infants begin to learn behavioural strategies to regulate negative emotion (Rothbart, Ziaie, & O'Boyle, 1992). Indeed, the association between marital conflict and child adjustment has been found to be stronger for preschool children than older children (Mahoney, Jouriles, & Scavone, 1997).

Experimental evidence regarding the effect of adult conflict during infancy demonstrates short term effects on behaviour. When exposed to adults interacting in an angry manner, children at 2 years display increased aggression with a similarly aged peer in a play

session that immediately followed (Cummings, Iannotti, & Zahn-Waxler, 1985). From 12 months onwards, children have the capacity to distinguish between angry and affectionate interactions between adults (Cummings, Zahn-Waxler, & Radke-Yarrow, 1981). Furthermore, when assessed in the family home, children at 12 months show sensitivity to non-verbal angry expressions displayed by their parents (Cummings, Goeke-Morey, & Papp, 2003).

Recent evidence has demonstrated this pattern in children younger than twelve months. At eight-months, interparental conflict has been shown to affect child negative emotionality (Pauli-Pott & Beckmann, 2007). In early infancy, behaviours that serve to regulate emotions begin to emerge, such as disengaging from a source of distress by closing their eyes or averting their gaze (withdrawal). Crockenberg, Leerkes and Lekka (2007) suggest that marital conflict is a potential source of distress for infants, who may in turn use withdrawal to disengage from its negativity. Indeed, they found that the use of withdrawal in 6-month-old infants when presented with a novel toy (a potential source of distress) was positively related to the amount of marital conflict reported by parents. Furthermore, the amount of withdrawal at this age was related to levels of anxiety in the child at 2.5 years of age, demonstrating the predictive ability infants' regulatory behaviour has for later development (S. C. Crockenberg & Leerkes, 2006), and indeed the long-lasting impact that interparental conflict may convey into later childhood.

The ability to predict the effects of interparental conflict from such a young age may be partially explained by its effects on rapidly developing physiological mechanisms in infancy. Porter and colleagues (2003) measured cardiac vagal tone and emotion regulation in 6-month old infants, finding that marital conflict was related to less than optimal emotion regulation, including a negative and irritable tone. Furthermore, baseline vagal tone was lowered in those infants who were witnesses to more marital conflict in the home. Similarly,

greater interparental conflict was related to lower levels of RSA (respiratory sinus arrhythmia; cardiac vagal tone) in six-month-old infants after exposure to the still-face paradigm (Moore, 2010). This suggests those infants were more reliant on self-regulation rather than their parents' ability to respond sensitively, which might imply that interparental conflict may cause the infant to learn that their parents are less capable to support their needs, therefore, relying more heavily on their own regulatory mechanisms. Of particular interest, greater RSA withdrawal has been associated with increased anger expression in children between the ages of three and five (Donzella, Gunnar, Krueger, & Alwin, 2000).

Little research has primarily investigated the effect of interparental anger during infancy, despite the varied literature suggesting the salience of anger in the family at this point in the lifespan. Indeed, overt and intense displays of anger and aggression by parents show more association with psychopathology in children than ratings of either covert tension in the relationship (Jenkins & Smith, 1991), or a lack of conflict resolution (Davies, Myers, & Cummings, 1995). Furthermore, the frequency of parents' shouting alone is a significant predictor of externalizing behaviour in children at 6 years of age (Jenkins & Smith, 1991). In light of this research, the current chapter will attempt to explore the association between interparental and infant anger, specifically.

6.1.2.4 The joint contribution of maternal and paternal anger, perinatal depression, and interparental anger in predicting infant anger. So far, a number of hypotheses positing the potential main effects of maternal anger, paternal anger, maternal perinatal depression, and interparental anger on infant anger have been suggested. Recently, studies have begun to address the joint contribution of these variables to the prediction of infant outcome. Indeed, there is evidence to suggest that there are notable links between these variables, which lend support for their associated contribution in the prediction of infant anger. Firstly, anger is known to be heightened in those individuals with depression, a pattern

that remains true during the perinatal period (see Chapter 4). Therefore, the link between maternal anger and infant anger may be explained by perinatal depression. Depression is also related to interparental conflict (Briscoe & Smith, 1973; Weissman & Paykel, 1974), with heightened conflict in couples where at least one partner is depressed. This effect is likely to remain when considering interparental anger specifically, given the well-established link between depression and anger. However, others have concluded that levels of anger are not always affected by partner depression over the perinatal period (Field et al., 2006). Clearly, amalgamating the variables will offer a more valid investigation of the prediction of infant anger. In one such study, researchers used an adoption design to demonstrate the importance of birth mother anger (a genetic predisposition) in the relationship between adoptive parents' marital hostility (the environmental influence) and late infancy anger (Rhoades, Leve, & Harold, 2011). Eighteen-month-old infants were susceptible to the effects of marital hostility, but only when their birth mothers had reported high anger (Rhoades, Leve, & Harold, 2011). Both environmental and genetic effects may be at play in the prediction of infant anger, or indeed a gene-environment correlation. Although such analyses are beyond the scope of the current design, the influence of genetic factors is certainly worth considering within the interpretation of any findings.

6.1.3 Aims of the Chapter

Given the research reviewed above, the current chapter will explore the relevance of anger in the home to the infants' own developing anger expression in various contexts: maternal anger, paternal anger, maternal perinatal depression, and interparental anger. The research questions specifically concern the predictive ability of each of these variables to anger in the first-born child at two time points, six months of age (hereby termed early infancy) and toddlerhood. As a community sample, the Cardiff Child Development Study has

the advantage of estimating the effects of such predictors in a nationally representative sample of families. A series of hypotheses will be tested in turn, and these follow the same process at both time points. Firstly, it is hypothesised that maternal anger will have a direct association with infant anger. Secondly, an exploration as to whether paternal anger is associated with infant anger will be conducted, a pattern that is yet to be investigated. Thirdly, the contribution of maternal anger to infant and toddler anger will be evaluated, controlling for mothers' diagnoses of antenatal and postnatal depression. Fourthly, it is hypothesised that interparental anger will also show an association with infant anger.

6.2 Method

6.2.1 Subsample of Participants in Chapter Six

The choice of subsample used in the current chapter is identical to that used in the previous chapter so that data regarding maternal anger, maternal depressive symptoms, and interparental anger were available. The sample consisted of families with stable parental relationships at both pregnancy and six months post partum (married, cohabiting, and those in relationships but not living together). Mother's average age at first birth was 30 years, ranging from 17 to 41; 86% had achieved more than the basic educational qualifications, and 63% were from a middle class background, whilst the remaining 37% were considered working class. Lastly, 92% of the 218 sample were of British ethnicity.

6.2.2 Procedure

A brief outline of the procedures relevant to the current analyses is presented. Details regarding the full procedure in the CCDS are contained in Chapter 2.

6.2.2.1 The antenatal assessment. Mothers and fathers were visited at home in the third trimester of pregnancy. Full details regarding the assessment are described in section 2.2.3.1. For this chapter, data from the maternal interview and maternal and paternal questionnaires were used.

6.2.2.2 The early infancy assessment. A home visit was conducted at approximately six months postpartum. Full details regarding this assessment are described in section 2.2.3.2. Data from the maternal interview and questionnaires from all informants were used. An observational task from this assessment also provided data.

6.2.2.3 The early toddlerhood assessment. When infants were between 18 and 24 months of age, a further home visit was arranged with the families. Full details are described in Chapter 2 (section 2.2.3.4).

6.2.2.4 The late toddlerhood assessment. This assessment took place between 30 and 36 months of age, and consisted of a birthday party scenario, for which families were invited to the University. Full details of this assessment are described in Chapter 2 (2.2.3.5). Questionnaires given to families at this assessment were used in the current analysis.

To maximise the available data, informants' reports regarding toddler anger was averaged between the early and late toddler assessment.

6.2.3 Measures

6.2.3.1 Infant and toddler anger. Mothers, fathers, and a third informant were asked to complete the CCDS Milestones Questionnaire, which contained two items used for the specific rating of infant anger; '*has angry moods*', and '*has temper tantrums*' (Hay, Perra, et al., 2010). Informants rated whether the infant had yet to show those behaviours, amongst an array of developmentally appropriate behaviours such as '*turns towards someone who is speaking*', and '*plays peek-a-boo or other games*'. Informants reported that the behaviour had either occurred *often*, *sometimes*, or *not yet*. Infant anger was rated at the early infancy assessment at Wave 2 and at the two toddler assessments (Waves 4 and 5). For toddler anger, a mean score between the Waves 4 and 5 rated anger was chosen as it allowed the inclusion of the maximal number of participants in the sample. For both age measures, the two anger items were summed to create a composite anger score.

A multi-informant method for rating infant anger was considered the optimal choice, given that mother reported temperament measures have been shown to reflect both infant behaviour and mother's attribution biases (Bates and Bayles, 1984). The mean anger score was computed across all available informants for each case. In 217 of 218 cases (99.5%), at least one informant completed the questionnaire items at six months postpartum. Of the 217

cases, 214 mothers (99%) provided data, along with 200 fathers (92%) and 165 other family members or friends who knew the infant well (76%).

At toddlerhood, when an age-appropriate version of the CCDS Milestones Questionnaire was administered again at Waves 4 and 5, the questionnaire items were completed by at least one informant in 191 cases (88% of those who had completed the questionnaire at six months). Of the 191 available scores for toddler anger, 186 (97%) mothers provided scores, 171 fathers (90%), and 151 (79%) third informants.

At each age, both anger items were highly correlated ($r = .66$ at both early infancy and toddlerhood), and so the mean between both items was calculated to create the composite infant anger score. The agreement between mothers' and fathers' ratings of infant anger at six months was significant ($[199] = .48, p < .001$), as was that between mothers and third informants ($r[166] = .33, p < .001$). Fathers and third informants others also showed significant agreement ($r[158] = .27, p < .001$). Mothers and fathers showed agreement in ratings of their toddlers' anger in early toddlerhood, $r(167) = .35, p < .001$, as did mothers and third informants, $r(148) = .40, p < .001$. Father's and third informants were also in agreement, $r(136) = .20, p < .05$. The consistent agreement between informants allowed a mean estimation of infant anger scores to be calculated between available informants at each wave. The distribution of scores for the composite infant anger variable at both time points was sufficiently normal to permit parametric analysis.

To validate the informants' ratings of infant anger in early infancy, an age when the ability to express anger is just emerging, infants were observed during an everyday restraint task (being strapped into a car seat) designed to elicit frustration, the LAB-TAB car seat task (Goldsmith & Rothbart, 1999). Research has shown that crying is a valid measure of negative affect in response to frustration (Calkins et al., 1996; Stifter & Braungart, 1995). Observers rated videos for the occurrence of strong vocal distress (crying and screaming)

within 5-second time intervals during the 30-second duration of the car seat task, yielding a dichotomous variable of ‘any strong distress’

The total frequency of strong vocal distress was significantly associated with the mean rating of infant anger across informants, $r_{pb}(205) = .17, p = .02$. The significant association with a 30 second sample of infants’ observed behaviour allowed confidence in the informant-rated measure employed in further analysis in this chapter.

6.2.3.3 Mothers’ perinatal depression. Mothers’ depression status both during pregnancy and the first six postpartum months was assessed using a process identical to that described in Chapter 4. Mothers who had experienced a depressive episode at any point during their pregnancy were coded as 1 for antenatal depression, and 0 for no evidence of a depressive episode. Likewise, mothers who had experienced a depressive episode, or a continuation of a depressive episode from pregnancy, at any point in the six-months following birth were coded as 1, or 0 if there was no evidence.

6.2.3.4 Interparental anger. The measurement of interparental anger was identical to that described in Chapter 5. For the purpose of this chapter, a mean between the four ratings of mothers’ and fathers’ self- and partner- rated anger was used, and referred to as joint interparental anger. This joint composite score was chosen to avoid issues of multicollinearity that would arise when including mother and father interparental anger ratings as separate predictors in a regression model.

Two items measuring the frequency of overt expressions of anger were taken from the Iowa Family Interaction Rating Scales (Melby, Conger, Ge, & Warner, 1995). Mothers and fathers were asked to rate the frequency with which they expressed anger in the context of their relationship, providing a self-report measure of behaviour (how much they express to their partner), and a measure of their partners’ behaviour (how much their partners expresses toward them). Self-reported anger items included ‘*how often do you get angry at her/him?*’,

and ‘*how often to you shout at her/him because you were upset with her/him?*’ Items assessing the ratings of partners’ anger were similarly worded: ‘*how often does your partner get angry at you?*’, and ‘*how often does your partner shout at you because s/he was upset with you?*’

The frequencies of the expressions of anger were rated on a 1-7 scale, labelled as *always* through to *never*. Scores were reversed before analysis for the purpose of clarity, with higher scores representing higher frequencies of anger.

6.2.3.5 Mothers’ pre-childbirth and observed anger. The measure of mothers’ pre-childbirth anger developed in Chapter 3 provided a measure of mothers’ general propensity to express anger prior to the child’s birth. The measure of pre-childbirth anger was assessed for its association with observed maternal anger, to ensure its predictive validity. A randomly selected subsample of mothers was video recorded in a two-minute mother-infant interaction task in the home at six months postpartum. Mothers were asked to interact with their infants using an activity board. Maternal speech was later coded for the presence of anger in a 5-sec time sampling method, to gain a frequency score. Mothers’ vocal expression of anger was operationally defined vocally as, *impatience in the voice, lowered in pitch, a loud voice of harsh quality, or speech under the breath*. The words themselves were not necessarily negative, but rather the tone of the voice was measured. Four coders provided inter-rater reliability, which high agreement (pooled intra class correlation = .85). A Spearman’s Rho test of association between self-reported pre-childbirth anger and experimenter-observed maternal anger was conducted. This revealed a significant positive relationship, $\rho(60) = .32, p = .01$, providing evidence for the predictive validity of the maternal pre-childbirth anger measure.

6.2.3.4 Paternal pre-childbirth anger. The measure of fathers’ anger before the child was born was computed in a manner identical to that reported in Chapter 5, a mean of

fathers' retrospective and contemporaneous endorsement of the items measuring anger in the questionnaire given during the pregnancy.

6.2.3.4 Mother's history of antisocial symptoms. Mother's antisocial history was included as a potential confound in the association between anger in pregnancy and postpartum depression. Mothers provided information about their history of antisocial behaviour in childhood and adulthood by questionnaires administered at pregnancy. Items referred to childhood conduct symptoms, and were included in a questionnaire titled 'What I Was Like as a Child'. Adult symptoms in line with a diagnosis of antisocial personality disorder (ASPD) via the DSM-IV were also included in a questionnaire titled 'What I am Like'. Items assessing symptoms of ASPD were taken from the International Personality Disorder Examination screening instrument (IPDE; Loranger et al., 1994). A composite score combining both the juvenile conduct and adult antisocial symptoms was created, and showed good internal consistency, $\alpha = .79$.

For the purpose of this chapter, items that pertained to anger only were removed from this variable, as those items had contributed to the measures of pre-childbirth anger. By including this differentiation, it was possible to consider the unique influence of anger whilst controlling for the influence of other symptoms of antisocial behaviour.

6.2.3.4 Sociodemographic risk. Information regarding mothers' social and demographic factors was obtained from the questionnaires and interview during pregnancy. The method of measurement was identical to that described in previous chapters. However, each of the four maternal sociodemographic factors (age, educational attainment, social class, and marital status) were considered separately and in composite form. The composite score was created by summing the dichotomous variables, whereby a higher score signified greater sociodemographic risk. This risk index showed a moderate level of internal consistency ($\alpha = .64$).

6.3 Results

6.3.1 Preliminary Analyses

6.3.1.1 Descriptive analyses and stability across time for the infant and toddler anger variable. At infancy, 11% of infants were rated as definitely showing angry moods. This increased to 23% by later infancy. Temper tantrums were less common in infancy, with just 6% of infants reported to be definitely having temper tantrums. By the toddler age, this figure increased to 28%. The most common rating for each behaviour at each time point was ‘sometimes’, apart from temper tantrums in early infancy. At six months of age, a 65% majority of infants were classed as not yet having temper tantrums.

The composite infant and toddler anger scores showed stability over time. A Pearson’s correlation revealed a significant association across time, $r(204) = .38, p < .001$.

6.3.1.2 Descriptive statistics and zero-order correlations. The means, standard deviations and ranges of scores for all continuous variables are presented in Table 6.1. The intercorrelations between all variables are presented in Table 6.2.

Table 6.1.

Descriptive Statistics for Infant, Toddler, Maternal and Paternal Pre-Childbirth Anger, and Joint Interparental Anger Postpartum.

Variable	<i>M</i>	<i>SD</i>	Range	
			Potential	Actual
Early infancy anger	0.56	0.42	0 - 2	0.00 - 1.83
Toddler anger	0.99	0.48	0 - 2	0.00 - 2.00
Pre-childbirth anger				
Mother	-0.04	0.96	-	-1.23 - 2.25
Father	0.00	1.00	-	-1.16 - 2.71
Joint interparental anger	2.69	1.07	1 - 7	1.00 - 6.75

Table 6.2.

Zero-Order Correlations between Predictor Variables, Control Variables, Infant and Toddler Anger.

Variable	2	3	4	5	6	7	8	9
1. Early infancy anger ^a	.38***	.15*	.08	.12†	.18**	.32***	.24***	.12†
2. Toddler anger ^b	-	.23**	.19**	.15*	.07	.26***	.10	.12†
3. Maternal pre-childbirth anger		-	.21**	.20**	.16*	.42***	.29***	.38**
4. Paternal pre-childbirth anger			-	.03	.09	.23***	.21**	.17*
5. Maternal antenatal depression				-	.31***	.13†	.22***	.14*
6. Maternal postnatal depression					-	.20**	.16*	.18**
7. Interparental anger						-	.27***	.22**
8. Demographic risk							-	.43***
9. Maternal antisocial history								-

$N = 218$ *** $p < .001$ ** $p < .01$ * $p < .05$ † $p < .10$

Note. ^a $n = 217$, ^b $n = 205$

6.3.1.3 Gender differences in infant and toddler anger. Mean scores in early infancy and toddler anger for both genders are presented in Figure 4. At early infancy, there appeared to be a trend towards a gender difference in anger scores between girls ($M = 0.50$, $SD = 0.40$) and boys ($M = 0.61$, $SD = 0.44$), $t(215) = -1.97$, $p = .05$ 95% CI [-0.22, 0.00]. In toddlerhood, there was no evidence for any gender differences in infant anger ($M = 0.99$, $SD = 0.46$, vs. $M = 1.00$, $SD = 0.51$), $t(202) = 0.22$, $p = .80$, CI [-0.15, 0.12]. A two-way mixed ANOVA was run to test for gender differences in infant and toddler anger across time. There was no significant effect of gender, with ratings of anger in general the same for girls and boys, $F(1, 202) = 1.05$, $p = .31$. There was a significant effect of age, $F(1, 202) = 226.54$, $p < .001$, with anger increasing between infancy and toddlerhood. However, there was no significant interaction between child gender and age, indicating that this increase was similar for both girls and boys, $F(1,202) = 2.54$, $p = .11$. Although the difference in anger scores between genders was approaching significance in early infancy, the decision to collapse across genders and perform analyses on the whole sample, at both time points, was made. Previous literature has concluded a lack of gender differences in anger and temper tantrums in the first few years of life. Rather, gender was added as a control variable in subsequent regression analyses.

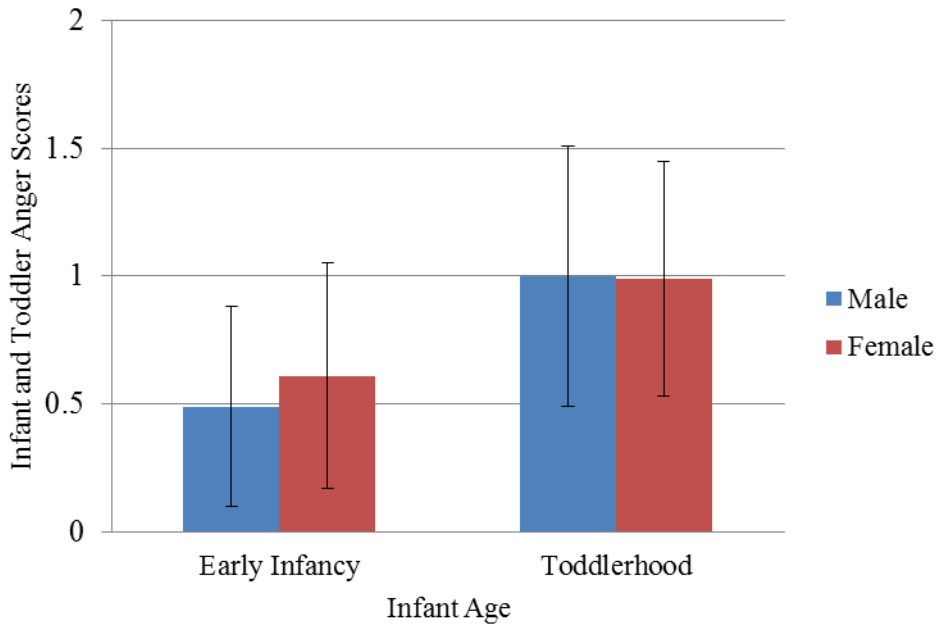


Figure 6.1 Mean anger in early infancy and toddlerhood as a function of gender. Error bars are standard deviations.

6.3.2 Predicting Infant Anger

6.3.2.1 The association between control variables and infant anger. Infant anger was significantly associated with social class, $t(215) = -2.24, p < .03, 95\% \text{ CI} [-0.25, -0.02]$. Infants with families of a working class background were reported to show more anger ($M = .64, SD = .38$) than those of a middle class background ($M = .51, SD = .43$). Early infant anger also differed between infants of mothers with less than basic ($M = .75, SD = .36$) and more than the basic educational qualifications ($M = .53, SD = .42$), $t(215) = -2.74, p = .007, \text{ CI} [-0.39, -0.06]$. Marital status showed a significant effect on infant anger, $t(215) = -3.18, p = .002, \text{ CI} [-0.30, -0.07]$. Infants with married parents were reported as less angry ($M = .49, SD = .41$) than those were unmarried parents ($M = .68, SD = .42$). Infants' anger also showed a significant negative association with mothers' age at first birth, $r(217) = -.21, p < .002$. Combining the cumulative risk of each of four factors detailed above provided the most parsimonious method for including demographic risk into the proceeding analyses.

As displayed in Table 6.2, Mothers' total score for symptoms of ASPD (minus anger) was significantly and positively related to infant anger. As expected, it was also related to mothers' pre-childbirth anger. The extent to which mothers' anger alone was related to infant anger, and not her general levels of conduct or antisocial symptoms, was measured by the inclusion of the ASPD variable in the regression analysis.

The distribution of infant anger scores were compared between mothers with and without evidence of antenatal and postpartum depression. Antenatal and postnatal depression were significantly related, $\chi^2 = 19.49$, $df = 1$, $p = .001$ (Fisher's exact test), OR = 10.56, 95% CI [3.22, 34.57]. Indeed, 40% of mothers with antenatal depression reported a further depressive episode, or a continued episode, within the first six months post partum. In comparison, fewer than 6% of mothers who had not been depressed antenatally experienced an episode of depression by six months postpartum.

The six infants whose mothers had experienced both antenatal and postnatal depression appeared to have highest anger scores ($M = 1.78$, $SD = 0.62$). The nine infants whose mothers had experienced depression in only the antenatal period were rated as less angry ($M = 1.28$, $SD = 0.73$) than the twelve whose mothers had only been depressed postnatally ($M = 1.42$, $SD = 1.14$). The majority of infants had mothers who had not experienced depression at either time point, and these infants displayed the lowest anger scores ($M = 1.06$, $SD = 0.82$). In a two-way ANOVA with infant anger as the dependent variable, only postnatal depression displayed a trend toward significance, $F(1, 216) = 4.70$, $p = .06$. There was no main effect of antenatal depression, or a significant interaction between the antenatal and postnatal depression.

Father's pre-childbirth anger was also tested for its association with infant anger, and is shown in Table 6.3. There was no significant relationship. However, mothers' and fathers'

levels of pre-childbirth anger were positively related; therefore fathers' pre-childbirth anger was included as a control variable.

6.3.2.2. The association between maternal pre-childbirth anger and infant anger.

Maternal pre-childbirth anger showed a direct association with infant anger, $r(217) = .15, p = .03$. To test whether the association between maternal pre-childbirth anger and infant anger remained after controlling for the relevant control variables noted above, a multiple regression was conducted. Sociodemographic risk, infant gender, mothers' ASPD scores, perinatal depression, and fathers' pre-childbirth anger, were entered at the first step. Maternal pre-childbirth anger was added at the second step. Table 6.3 displays the results of this analysis. Maternal pre-childbirth anger was no longer a significant predictor of infant anger once controlling for other variables. Indeed, the sociodemographic risk variable was the only significant predictor of infant anger.

6.3.2.3. The association between interparental anger and early infancy anger.

Interparental anger showed a significant and positive association with infant anger at the univariate level ($r[218] = .32$); parents who were expressing more anger to each other also rated their infants as angrier. To test the predictive ability once controlling for all other factors, interparental anger was added to the regression at the third step. Interparental anger remained a significant predictor of infant anger once controlling for sociodemographic risk, infant gender, mothers ASPD symptoms, perinatal depression, paternal pre-childbirth anger and maternal pre-childbirth anger.

Table 6.3

Hierarchical Linear Regression Predicting Early Infancy Anger

Predictor	ΔR^2	β	<i>B</i> (<i>SE</i>)	95% CI for <i>B</i>	
				Lower	Upper
Step 1	.08**				
Sociodemographic risk*		.18	0.07 (0.03)	0.01	0.13
Infant gender		.09	0.08 (0.06)	-0.04	0.18
Maternal ASPD		.03	0.02 (0.04)	-0.06	0.09
Antenatal depression		.05	0.07 (0.12)	-0.16	0.31
Postnatal depression		.10	0.16 (0.11)	-0.16	0.38
Paternal pre-childbirth anger		.03	0.01 (0.03)	-0.06	0.07
Step 2	.00				
Sociodemographic risk†		.17	0.07 (0.03)	0.01	0.12
Infant gender		.08	0.07 (0.06)	-0.04	0.18
Maternal ASPD		.02	0.01 (0.04)	-0.07	0.09
Antenatal depression		.04	0.06 (0.12)	-0.17	0.30
Postnatal depression		.10	0.16 (0.11)	-0.06	0.37
Paternal pre-childbirth anger		.03	0.01 (0.03)	-0.05	0.07
Maternal pre-childbirth anger		.05	0.02 (0.03)	-0.04	0.09
Step 3	.05***				
Sociodemographic risk†		.14	0.05 (0.03)	-0.00	0.11
Infant gender		.09	0.08 (0.06)	-0.03	0.19
Maternal ASPD		.02	0.01 (0.04)	-0.07	0.08
Antenatal depression		.04	0.07 (0.12)	-0.16	0.30
Postnatal depression		.07	0.11 (0.11)	-0.10	0.32
Paternal pre-childbirth anger		-.02	-0.01 (0.03)	-0.07	0.05
Maternal pre-childbirth anger		-.03	-0.01 (0.03)	-0.08	0.05
Interparental anger***		.26	0.17 (0.05)	0.08	0.27
Total R^2	.14***				

Note. N=217. CI = confidence interval.

† $p < .10$ * $p < .05$, ** $p < .01$, *** $p < .001$.

6.3.3 Predicting Toddler Anger

6.3.3.1. Associations between control variables and toddler anger. Toddler anger scores did not differ between families of working ($M = 0.97$, $SD = 0.50$) and middle class ($M = 1.03$, $SD = 0.44$), $t(203) = -0.83$, $p = .41$. There was no difference in infant anger between the offspring of married ($M = 0.96$, $SD = 0.50$) or unmarried parents ($M = 1.07$, $SD = 0.44$), $t(203) = -1.57$, $p = .12$. Nor did anger differ between toddlers of mothers with fewer than basic ($M = 1.05$, $SD = 0.42$) and more than the basic educational qualifications ($M = 0.99$, $SD = 0.49$), $t(203) = -0.59$, $p = .56$. However, toddler anger did show a significant negative association with mothers' age at first birth, $r(205) = -.18$, $p < .009$. Mothers' purified antisocial behaviour showed a trend towards significance with toddler anger, $r(205) = .12$, $p = .06$.

A two-way ANOVA comparing toddler anger ratings dependent on mothers' depression status at both time points was conducted. Toddlers whose mothers were not depressed either during pregnancy or postpartum were rated as the least angry ($M = 2.07$, $SD = 0.84$), and appeared to show little difference in anger when compared to the twelve toddlers whose mothers were depressed only in the postpartum period ($M = 2.07$, $SD = 0.99$). In contrast, the nine toddlers whose mothers had been depressed in the antenatal period only appeared to be angrier than both the former groups ($M = 2.43$, $SD = 0.76$). The toddlers rated the most angry were the five who had mothers who had been depressed both during pregnancy and postpartum ($M = 2.84$, $SD = 0.97$). Indeed, whilst the main effect of postpartum depression was not significant, antenatal depression showed a significant main effect on toddler anger scores ($F [1, 204] = 4.35$, $p = .04$). The interaction between antenatal and postpartum depression was not significant.

6.3.3.2 The association between maternal anger and toddler anger. There was a significant association between maternal pre-childbirth anger and toddler anger ($r[205] = .23$, $p = .001$). Given the association between maternal and paternal pre-childbirth anger found in the previous analyses, which remains true in this smaller sample ($r = .20$, $p = .01$), the relationship between paternal pre-childbirth anger and toddler anger was assessed. Unlike in the case of infants' anger, a significant positive relationship between fathers' pre-childbirth anger and toddlers' anger was found, $r(205) = .19$, $p = .01$

As with the prediction of infant anger, a multiple regression was conducted to assess the contribution of maternal pre-childbirth anger once controlling for sociodemographic risk, toddler gender, and perinatal depression, to the prediction of toddler anger. Paternal pre-childbirth anger was also added as a control variable, given its significant association with the outcome variable at this age. These control variables were added at the first step, with maternal pre-childbirth anger at the second step. Maternal pre-childbirth anger remained a significant predictor of toddler anger after controlling for all other variables (Table 6.3).

6.3.3.3 The association between interparental anger and toddler anger.

Interparental anger showed a significant association with toddler anger, $r(205) = .26$, $p < .001$. To test whether interparental anger at six months postpartum mediates the relationship between maternal pre-childbirth anger and toddler anger, Preacher and Hayes' method for mediational analyses was conducted using the SPSS PROCESS macro (Hayes, 2012). The data fulfilled the necessary prerequisites to allow a test of mediation: maternal pre-childbirth anger (the IV) was associated with joint interparental anger (the mediator) and toddler anger (DV), and parents' joint interparental anger was related to toddler anger when controlling for maternal pre-childbirth anger, $\beta = .23$, $p = .05$. For a significant mediation, the relationship between the IV and the DV should significantly reduce once the mediator is controlled for.

Figure 6.2 shows the results of this analysis; maternal pre-childbirth anger was no longer a significant predictor once parents' joint interparental anger was controlled for. Indeed, the indirect effect was significant, with a point estimate of 0.05, SE = .02, $z = 1.97$, $p = .05$, and a 95% bootstrap CI of 0.01 to 0.11.

Table 6.3

Hierarchical Linear Regression Predicting Toddler Anger

Predictor	ΔR^2	β	<i>B</i> (<i>SE</i>)	95% CI for <i>B</i>	
				Lower	Upper
Step 1	.26*				
Sociodemographic risk		.01	0.01 (0.06)	-0.12	0.13
Infant gender		-.01	-0.02 (0.12)	-0.26	0.21
Maternal ASPD		.10	0.10 (0.08)	-0.53	0.26
Antenatal depression†		.14	0.47 (0.25)	-0.02	0.95
Postnatal depression		.01	0.04 (0.23)	-0.42	0.49
Paternal pre-childbirth anger*		.18	0.15 (0.06)	-0.03	0.27
Step 2	.02*				
Sociodemographic risk		-.02	-0.01 (0.06)	-0.14	0.11
Infant gender		-.03	-0.05 (0.12)	-0.28	0.19
Maternal ASPD		.05	0.05 (0.08)	-0.11	0.22
Antenatal depression		.12	0.40 (0.25)	-0.09	0.88
Postnatal depression		.00	0.01 (0.23)	-0.44	0.46
Paternal pre-childbirth anger*		.15	0.13 (0.06)	0.01	0.25
Maternal pre-childbirth anger*		.17	0.15 (0.07)	0.01	0.28
Step 3	.02*				
Sociodemographic risk		-.04	-0.03 (0.06)	-0.15	0.10
Infant gender		-.02	-0.04 (0.12)	-0.27	0.19
Maternal ASPD		.05	0.06 (0.08)	-0.10	0.22
Antenatal depression		.12	0.40 (0.24)	-0.08	0.88
Postnatal depression		-.01	-0.04 (0.23)	-0.49	0.41
Paternal pre-childbirth anger†		.12	0.11 (0.06)	-0.02	0.23
Maternal pre-childbirth anger		.11	0.10 (0.07)	-0.04	0.24
Interparental anger*		.17	0.23 (0.10)	0.02	0.43
Total R^2	.11**				

Note. N=205. CI = confidence interval.

† $p < .10$ * $p < .05$, ** $p < .01$, *** $p < .001$.

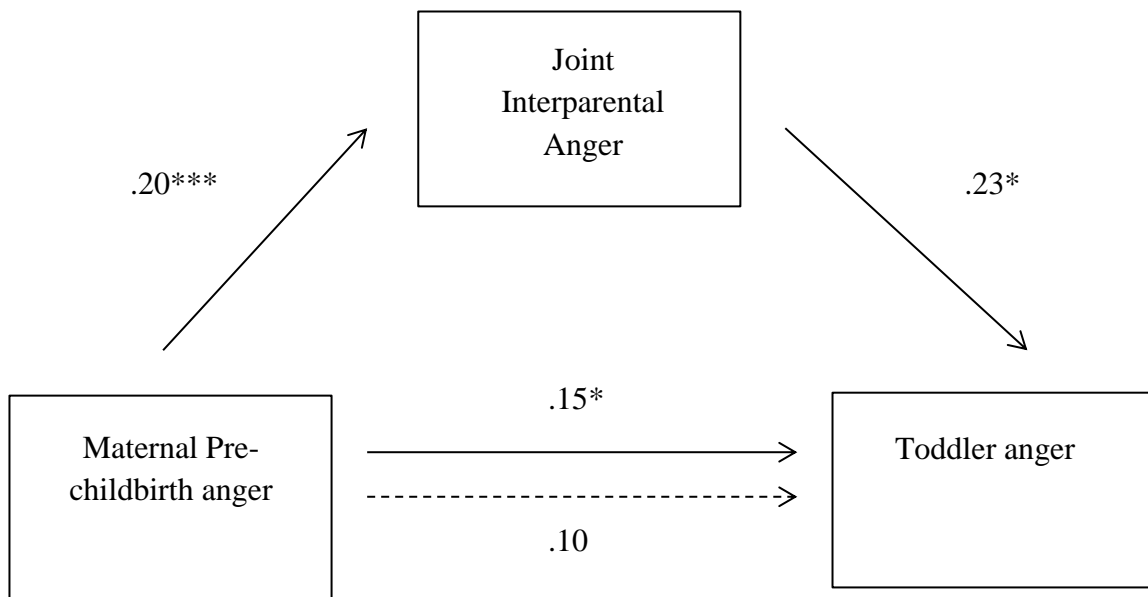


Figure 6.2 Mediation model displaying the direct pathway between maternal pre-childbirth anger and toddler anger (the solid line), and the tested indirect pathway via the mediator of interparental anger (the dotted pathway), whilst controlling for all other variables.

Unstandardized coefficients are presented.

6.4 Discussion

The focus of this final empirical chapter was to explore the relevance of maternal and interparental anger as predictors of anger in offspring, measured both as infants and later as toddlers. In previous chapters, anger was found to be a salient emotion across the transition to parenthood. In this chapter, the salience of such variables for the developing infant was to be established. Results for the analysis of infant and toddler anger will be discussed in turn.

Whilst a univariate analysis between maternal pre-childbirth anger and infant anger revealed a significant association, this was no longer significant once sociodemographic risk was accounted for. However, joint interparental anger was a significant predictor of infant anger, remaining so when controlling for sociodemographic risk. On the surface, this data suggests that maternal anger pre-childbirth – her propensity to anger before having a child – is unrelated to infant anger. However, the more proximal measure of interparental anger, measured concurrently, is related to reported frequency of anger in the infant.

More toddlers express anger than infants. However, there is also stability in the frequency of anger between the two time points, suggesting the tendency to express anger is consistent across the early years; those infants who were definitely expressing anger at six months were also those expressing the greatest anger approximately two years later. Factors predicting the frequency of anger in toddlerhood emerged in analyses analogous to that conducted earlier in infancy. By this age, toddler anger was not as predictable from sociodemographic factors (mothers' age was the only significant demographic predictor). Rather, psychological factors in both the mother and father appeared most relevant. Maternal pre-childbirth anger showed a significant association with toddler anger, remaining so once controlling for sociodemographic risk. However, interparental anger remained a significant predictor of toddler anger. Indeed, the association between maternal pre-childbirth anger and

toddler anger was explained by interparental anger, suggesting an indirect effect of maternal anger via the expression of anger between parents in the home.

Together, these results suggest that maternal pre-childbirth anger, measured before the birth and therefore unaffected by infant temperament, does not exert an influence on child anger until at least toddlerhood. At that age, its influence is driven by the frequency of anger expressed between parents in the home. However, no causal relationships can be inferred from the data, and further exploration of these findings would be required to consolidate these results.

There is promise in measuring both maternal and infant anger as young as six months by questionnaire. The measure of infant anger shows an association with the expected risk variables, is related to observed behaviour, and there is good agreement between informants. Likewise, it shows an association with a parallel measure taken later in toddlerhood. The measure of maternal pre-childbirth anger shows good external validity, indicated by its association with experimenter-observed maternal behaviour in interaction with infants at six months post partum. The validation of these two variables by via measurement of objective observed behaviour is a definite strength to the current study.

The relevance of maternal perinatal depression to the prediction of infant and toddler anger was discussed earlier in this chapter. Previous research has postulated that postpartum depression affects the developing infant through maternal behaviour, specifically intrusive interactive behaviours (Diego et al., 2006). Antenatal depression has also been shown to exert deleterious effects on infants, with infants of mothers who were depressed in pregnancy displaying more negative affect (Huot et al., 2004) and externalizing behaviours later in childhood (de Bruij et al., 2009). Indeed, antenatal depression exerts an influence later in childhood (Luoma et al., 2004; Luoma et al., 2001). Indeed, Field (2011) suggested that maternal anger may be an important confound in this relationship. The current data extend

this proposition, confirming that the impact of maternal pre-childbirth anger, and interparental anger, on toddler anger remains significant when controlling for antenatal (and postnatal) depression. This is an important strength to note, especially given the high association between depression and anger reported in Chapter 4 within this thesis.

The suggested influence of interparental anger on infant and toddler anger may be conveyed via a number of methods of transmission. An emotional climate characterised by anger may sensitize the developing child to this emotion, in turn increasing their expression of similar affect. Data presented by Cummings et al. (1985) would support this notion; they found that exposure to angry adult interaction increased aggressive behaviour in two-year-olds. The current data suggest this relationship may be present from the six months of age, and extends to an analysis of anger, not just aggression.

A further method of transmission may be physiologically driven. Porter and colleagues (2003) and Moore (2010) found that marital conflict, albeit not anger specifically, affected the baseline vagal tone of six-month olds. These authors postulate that infants who are witness to heightened conflict become overly reliant on their regulatory mechanisms, and less on the emotional support of their parents when distressed. Research into parenting style would provide an extension of this notion, hypothesising that increased conflict or anger in the parental relationship spills over to parent-infant interaction. The emotion of anger may be expressed more often, or the resulting tension from conflict may prevent the mother or father from providing optimal parenting.

A further method of transmission, suggested by Rhoades et al. (2011), is the genetic predisposition that mothers (and fathers) high in anger may convey to their infants. In their genetically informed design, birth mothers high in anger conferred a susceptibility to marital hostility to their infants. Those infants whose birth mothers were classified as low in anger were unaffected by marital hostility in their adoptive parents. This finding, although

requiring replication, suggests that both the hereditary and environmental components are important. Indeed, those infants with high anger birth mothers who were not exposed to heightened marital conflict did not display heightened anger themselves. When applying this knowledge to the data contained in this chapter, considerations for the gene x environment correlation of anger emerge. This is especially noteworthy given the knowledge that both mothers and fathers with heightened pre-childbirth anger display higher interparental conflict postpartum (see Chapter 5).

Some limitations to the current methodology exist, which must be noted before confirming conclusions from the data. Firstly, although the measure of pre-childbirth anger shows concurrent validity with independently observed behaviour, its reliance on retrospectively worded items is less than ideal. Indeed, the observational validity measurement is provided during the perinatal period, which may inflate the chance of finding a significant association with questionnaire-rated pre-childbirth anger. The childhood anger is measured during pregnancy, and although the validating observation of anger occurs at six months postpartum, these two time points are relatively close (within the perinatal period). However, given the significant correlation of pre-childbirth anger with age, and the confidence in previous research assessing continuity in anger between childhood and adulthood, and across adulthood, there is suitable confidence in using pre-childbirth anger variable for this purpose. Ideally, corroboration of scores by an informant regarding past behaviour would be an appropriate way to ensure further confidence in the measure.

Similarly, the measure of interparental anger is brief, and not corroborated by observed behaviour. However, the high agreement found between partners' ratings of their own and each other's anger and shouting suggest sufficient confidence in this measure. Furthermore, the presence of shouting alone has proven relevant to the prediction of externalising behaviour in children at 6 years (Jenkins & Smith, 1991), supporting the use of

this brief measure. One way in which the study could be improved would be to develop the method in which anger and shouting are measured: for example, by detailing the intensity of the anger, measuring the exact frequency of shouting, or by measuring the frequency with which these behaviours are expressed in front of the infant or toddler. The results gleaned from the current study suggest such research would prove highly informative in furthering our understanding of how interparental conflict, specifically interparental anger, exerts and influence on the child's own early developing anger.

CHAPTER 7.

GENERAL DISCUSSION

7.1 A Summary of the Findings

The first overarching aim of this thesis was to explore the presence and course of anger in a sample of first-time parents, particularly mothers, in the context of perinatal depression and the parental relationship. A subsample was drawn from the Cardiff Child Development Study, a longitudinal study of first time parents and their young children followed from pregnancy to three years postpartum.

The aim of the first empirical chapter was to explore the course of women's anger over their first entry to motherhood, and explore predictors of any self-perceived change in anger between pregnancy and six months postpartum. When anger was measured by self-report questionnaire, mothers reported a small but significant increase in the frequency with which they lost their temper between the two points in time. In contrast, the sensations of rage or loss of control – more intense expressions of anger – did not change in frequency across time. These behaviours were rarer at both time points, while loss of temper was relatively common in pregnancy (64%) and more so postpartum (75%).

When the same women were asked about their perception of increased anger by interview, 18% of mothers reported that the occurrence of shouting, having arguments,

raising the voice, loss of control, flare ups, and/or loss of temper was more frequent after birth. What is more, the minority of women who noticed this increase were less well educated, but differed on no other demographic variable.

Whilst there was a degree of change in anger frequency across measurement points, with some mothers who had reported not losing their temper during pregnancy but endorsing this behaviour in the postpartum period, the frequency of anger was also stable across time. This suggests some continuity in individual differences in anger expression across the two perinatal time points. The analyses also explored this potential stability across the life span, comparing retrospectively measured childhood anger, anger in the last five years leading up to pregnancy, and anger in pregnancy. Associations between anger frequencies were significant, suggesting that continuities in women's frequency of anger expression were established before having a child. Furthermore, the combined measure of women's anger before having her first baby (*pre-childbirth anger*), a factor score, predicted whether mothers increased or showed no change in the levels of anger after having a child. This suggests that women's proclivity to anger is related to both their frequency of anger in the postpartum months and their experience of an increase in anger across the transition to parenthood.

In the second empirical chapter, the frequency of mothers' anger was explored within the context of perinatal depression. Mothers who were found to meet criteria for a depressive episode during their pregnancies reported more anger than those who were well. Indeed, the same pattern was true when mothers with postnatal depression within the first six months were compared to those who were well.

Depression and anger shared an association with demographic and situational characteristics that may have explained their covariance. In the antenatal period, a diagnosis of depression and heightened anger were both likely when the pregnancy has been unplanned (although anger showed a trend towards significance here). Antenatal depression and anger

were also more prevalent and heightened in mothers with fewer than the basic education qualifications, in working class mothers, and in younger mothers. However, the contribution of antenatal depression to anger in pregnancy remained significant even when controlling for these shared factors.

In the postpartum period, depression and anger were both heightened when mothers were not in stable partnerships with the father (the difference in anger between mothers by partnership type approached significance but was worthy of note). Mothers with postpartum depression were younger, and younger mothers also reported more anger post partum. Sleep disturbances in the postnatal period were also positively related to postpartum anger, and more likely to be evident in mothers with depression. However, once these factors were controlled for, postpartum depression remained a significant predictor of postpartum anger.

Attention was next paid to whether anger predicted depression by assessing the contribution of reported anger in pregnancy to a diagnosis of depression in the postpartum period. Although antenatal depression, the most consistent predictor of postnatal depression, was the strongest predictor, levels of anger in pregnancy also made a significant contribution to the prediction of postpartum depression, even when controlling for antenatal depression and mothers' history of antisocial and angry behaviour.

Together, the results of this chapter suggest that anger and depression are very much related, both concurrently and across time. Indeed, both variables are important in the prediction of each other, and the relationship between depression and anger appears to be bidirectional. However, they are also separate entities; whilst anger and depression co-vary substantially, they also independently predict later depression and anger.

Chapter 5 focused on the presence and course of anger across the transition to parenthood in the context of the parents' couple relationship. When assessed independently, mothers' and fathers' anger scores were highly associated; women with higher anger had

partners with higher anger. This was true at both the pregnancy and postpartum time points. However, analysis of differences between partners revealed that mothers showed a greater frequency of anger than their partners at both points in time.

When assessing patterns of change over time, both mothers' and fathers' anger expressed to each respective partner increased between pregnancy and six months postpartum. The finding was particularly substantive for mothers, whose change in anger had a medium effect size, whilst the effect size for father's change in anger was small. In real terms, 55% of mothers and 50% of fathers reported an increase in their anger scores postpartum in the tested sample. Mothers who increased in anger across the transition were more than likely to have a partner who followed the same pattern.

The second overarching aim of the thesis was to explore the association between parental anger and the development of anger in offspring. Maternal pre-childbirth anger appeared to be associated with infant anger measured at six months of age; however, this relationship was fully explained by their shared association with sociodemographic risk. However, joint interparental anger – the frequency of anger expression between parents at six months post partum – was related to infant anger, and remained so when controlling for sociodemographic risk.

By the toddler age, levels of reported anger in offspring increased significantly; the frequency of temper tantrums and angry moods were more common as endorsed by mothers, fathers and third informants. In predicting toddlers' anger, a slightly different pattern emerged than that in infancy. Maternal pre-childbirth anger was again associated with toddler anger, but this remained significant after controlling for sociodemographic risk, perinatal depression, and maternal antisocial behaviour. Fathers' pre-childbirth anger also showed an independent association with toddler anger. This suggests that, by the toddler years, both mothers' and fathers' propensity to anger as measured before childbirth predicted the

development of anger in their young children. Indeed, this relationship appeared to be driven by parents' expressions of anger within their relationship; when joint interparental was added to the equation, the association between mothers and fathers' pre-childbirth anger was no longer significant.

7.2 Limitations and Caveats

Whilst the corpus of research described in this thesis reveals novel and interesting results, there are a number of limitations to address in summarising this work. Firstly, although the CCDS as a whole employs a representative sample, the subsample featured in this thesis differs in demographic characteristics to the full sample. Specifically, mothers in the sample used in this thesis were generally older than the national average, were slightly better educated, and more of them were classified as middle class than the national average. Despite these differences, the representation of the UK population is not as skewed as that in other smaller studies of maternal anger, and every effort has been made to control for demographic variables wherever necessary, to reduce their potential confounding effect. Of course, there may still be some patterns in change or association that would emerge in a sample that better represents the population. For example, as noted in Chapter 6, the incidence of antenatal depression is reduced in this sample as compared to the full CCDS sample, which may have reduced the possibility of finding significant associations with infant outcomes. The findings suggest that further investigation on a fuller representative sample is called for, together with specific work involving those families at particular high risk. Investigations into mothers and families who enter parenthood as teenagers, or who at high risk in other respects, would allow specific patterns of association in these groups; the risks conferred by such families may differ qualitatively and quantitatively from those in the broad sample in this thesis.

Two major factors influenced the choice of sample and its demographic representation. Firstly, it was necessary that mothers reported their levels of anger contemporaneously for the necessary analyses in Chapters 3 and 4. A number of women were not able to complete questionnaires in the allotted time windows, and these women were younger, less well educated, and more likely to be working class. A decision was taken that the Adult Wellbeing Scale, as a measure of present mood state, should not be administered retrospectively in catch-up questionnaires. This meant that the key anger items were not administered to women who were traced and found after the time window had closed. The overall attrition in the CCDS is remarkably low, and whilst it is unfortunate that this variable was not available in all cases, the sample size remains large enough to detect the effects that were hypothesised.

Secondly, the nature of the research questions contained within Chapters 5 and 6 determined that parents be in stable relationships, and remain so at the time of the postpartum measurement. This consideration also reduced the size of the sample, and also changed the demographic characteristics; mothers in families who met the inclusion criteria appeared slightly older, better educated, and more likely to be classified as middle class than mothers who were single or in unstable relationships. However, these differences were not statistically significant between the two samples employed in this thesis (234 vs. 218), suggesting that the resulting findings that are taken from them are comparable.

Because of the focus on the course and influence of interparental anger, the analyses here do not consider the association between maternal anger and infant or toddler anger in single mothers. Reassuringly, there does not appear to be a statistically significant difference in maternal pre-childbirth anger when comparing mothers who were and were not in stable partnerships (although there may not have been the power to detect these effects). However, the manifestations of mothers' anger in the postpartum environment, and the methods of its

transmission to the child, are likely to be qualitatively different. Furthermore, although the influence of interparental anger would not be comparable in single mothers, there may be other individuals in the mothers' life to whom she may express anger, or receive anger from. For example, the infant's father, grandparents, extended family or friends. This topic warrants further investigation.

A further limitation of the data concerns methodology, in particular the choice of measurement. Whilst the measures of anger contained in this thesis are fit for purpose, they could be improved upon. Given the exploratory nature of this work, and the process of conceptualising anger that occurred as the thesis developed, the measurements are not ideal, and further work is needed to further test the findings. Firstly, the measures of anger are comprised of small sets of items. Whilst they have proven efficient in measurement, and have allowed a number of significant findings to emerge, the small number of items may not capture a wider range of scores that a more fine grained measure may allow. For the purpose of exploring the topic, as has been the case in this thesis, the measures are viable.

Secondly, whilst efforts were made to validate each questionnaire-rated measure where possible, further work to ensure the validity of some measures would aid confidence that the ratings accurately depict emotion. Whilst confidence in the maternal pre-childbirth anger measurement is increased by its association with observed behaviour, this validation exercise was not measured concurrently. Concurrent expressions of anger, measured before pregnancy, would be most suited to validate this self-report measure. Interparental anger, although not validated by observation, showed remarkably high agreement between partners. Finally, the measurement of infant anger was validated by its association with observed infant anger in response to distress. There was no available measure of toddler anger coded to allow the validation of the measure at this age. However, the toddler measure was significantly

associated with anger measured in infancy, suggesting it too provided a relatively accurate indication of true behaviour.

Further efforts to validate the anger and interparental anger self-reports would increase the confidence in the global measures employed in this thesis. Although maternal pre-childbirth anger was partially validated by its significant association with experimenter-observed anger in a random subsample, extending this validation exercise to the entire sample would be an ideal future step within the CCDS. For the validation of fathers' pre-childbirth anger and interparental anger, a different approach would be required that is unavailable in the current study design. Firstly, observations of father behaviour were not made in the CCDS. Thus, a separate study would be needed to assess the validity of the paternal pre-childbirth anger measure by an observational coding scheme analogous with that designed for maternal anger and included in this thesis. Secondly, an observation of both parents in interaction was not available; such a design was outside of the original aims of the CCDS. Methods for observing interparental conflict that have been used previously could inform similar measures of interparental anger. These include rating conflict-related behaviours using coding schemes such as the Interactional Dimensions Coding System (Julien, Markman, & Lindahl, 1989), the System for Coding Affect Regulation in the Family (Lindahl & Markman, 1991), or measuring facial expressions of anger (Gottman, Levenson, & Woodin, 2001) to observe partners in a marital discussion tasks, in joint parent-child tasks, and observing couples discussing their marital problems (e.g., Lindahl, Clements & Markman, 1997). Heyman (2001) presents a series of suggestions for the validation of such observational measures. This future step has two advantages. While coding for instances of anger via observation presents a future step in validating the questionnaire measures, it may also provide the tools for observing behavioural processes by which anger may be conveyed to the developing child.

7.3 Implications of the Findings

The results contained within this thesis suggest that consideration for the emotion of anger in new parents is an important endeavour, both for the wellbeing of parents themselves and the emotional development of their first child. Much literature exists detailing the changes that parents undergo when adapting to their first child, or indeed to multiple children, yet few of these studies considered the course of parental and interparental anger. This corpus of research in this thesis suggests that studying anger in its own right is a worthwhile task.

A number of factors were revealed to be particularly important in predicting levels of anger in the postpartum period and change over time. Firstly, mothers with higher 'baseline' anger scores (measured pre-childbirth) were those most likely to respond to the birth of their first child with increased expressed anger. If expressions of anger in the postpartum period are considered to be detrimental, as the results in Chapter 6 suggest, screening for heightened anger during pregnancy may prove to be a useful way of highlighting those mothers-to-be who are at risk of a less than optimal response to the birth of their first child. Such an endeavour would also prove useful in screening for those mothers who go on to develop postpartum depression, given that maternal anger in pregnancy predicted postpartum depression independent of antenatal depression.

Chapter 4 presented research suggesting a meaningful link between the expression of anger and a diagnosis of depression in both the antenatal and postnatal periods. Indeed, mean anger levels were twice as high in mothers who had experienced a depressive episode across either time point. This suggests that anger is a significant feature of perinatal depression, echoing the qualitative findings noted by Beck (1996) that mothers with depression describe that anger can fill their daily interactions with their new baby. Thus, concentrating on these feelings of anger may be a worthwhile cause for clinicians. Similarly, the recognition that

feelings of anger may dominate within a diagnosis of depression may provide a further method for the screening of depression by Health Visitors or other professionals.

Furthermore, concentration on the experience of anger and depression in the antenatal period should be a complementary implementation. This is especially true given the need to screen for, and treat, antenatal depression for the benefit of mothers and their offspring.

7.4 Future Directions

The research contained within this thesis has highlighted the importance of studying the emotion of anger in two related research contexts: the transition to parenthood and the prediction of early emotional development in infancy. The exploratory and descriptive nature of much of this research, although valuable, neither specifies nor confirms causal mechanisms. In the case of the transition to parenthood, research investigating further variables that are noteworthy in the prediction of maternal and interparental anger change would be to identify those parents for whom the transition to parenthood results in increased anger. Specifically, consideration for whom the transition is most difficult, and in which circumstances anger change may occur, or indeed whether a moderated mediation effect is in play, would allow a fuller picture to be drawn. Studies yielding increased detail regarding the rate of change, by measuring more time points, would be better placed to delineate the course of maternal and interparental anger across the transition.

Similarly, a clearer picture regarding the nature of anger frequency across the transition to parenthood would be possible if measurement began before pregnancy itself. Such a method would involve other methodological complications, such as recruiting parents-to-be prospectively, and preventing selection effects in targeting parents who have planned their pregnancy (and so will likely differ in their response to pregnancy and birth). However, the inclusion of a control group of non-parents in such a design would further confirm the

conclusion that the increase in anger is due to the addition of a child, at least in part, and not to any natural increase in anger between parents across time.

Future work on the screening, treatment and aetiology of perinatal depression may be improved by considering the measurement of anger. It would be especially interesting to observe whether the experience of anger is affected by the treatment of depression across the perinatal period. Some research suggests anger remains heightened in individuals who have subsequently recovered from depression as compared to those who were never depressed, so it could be possible that to tackle anger, clinicians would require separate, or modified, treatments. Further research is required to investigate the minutiae of depression and anger, and how they interact, via detailed and predetermined measurement. Similarly, further research should also consider the relevance of anxiety disorders in the covariance between anger and depression. Anxiety is associated with both depression and anger, and each may convey similar risks to the developing child. In considering these notions, future research would allow a clearer estimation of the independent effects of anger on the developing child, and a more complete picture of the potential comorbidities between the three facets of mental health that commonly go hand in hand.

With the knowledge that behavioural traits, temperaments, and emotional propensities are partly genetically determined, further research into the prediction of infant anger employing genetically informed designs are necessary in gaining a full picture of the determinants of infant anger. Indeed, whilst aspects of emotionality are conferred through genetic predispositions, these patterns are likely to be environmentally mediated. Adoption designs, twin studies, and studies that use genetically sensitive in vitro fertilization designs would provide a prime opportunity to establish the nature of genetic, environmental, and gene-environment correlation factors in the prediction of infant anger.

As highlighted earlier in the thesis, anger is known to be highly related to psychopathology, including depression, conduct disorder, antisocial personality disorder, and bipolar disorder. Some argue that the precursors to such disorders are identifiable from the first years of life (Hay et al., 2011; Kim-Cohen et al., 2005). Follow-up measures of the children within the CCDS, and replication in others studies, would allow one to establish whether the early manifestation of anger measured in these infants and toddlers is related to later psychopathology, at ages when standardized diagnostic measures of conduct disorder or internalizing disorders are available and valid.

Conversely, anger may not always signal unfavourable behaviours, consequences, or outcomes. Some note that anger is predictive of persistence (Sullivan, 2007), presumably through its shared association with motivation. In a simple measure of infant anger, as employed in this thesis, neither the quality of the anger expressed nor its justification can be assumed. This is true of both the infant and parental measured anger within the CCDS. Many definitions of anger detail the adaptive, positive and motivational effects first and foremost, and consider the maladaptive, deleterious effects as present when something in the processing of the anger response has gone awry (a biased attribution, misplaced blame, etc.). In line with this nuanced appreciation of the emotion of anger, research into the development of anger in infancy should consider the potentially positive effects of the emotion, and indeed the negative effects entailed with a lack of anger expression. Likewise, research considering the transition to parenthood may benefit from appreciation of the positive benefits of conflict and anger; specifically, the negative effects of anger that is felt but not expressed.

Finally, to develop the arguments presented in the thesis, developmental research of an observational nature would be a productive and applicable method with which to describe the processes by which anger is presented to the infant and toddler, and may impact on their behaviour. Nancy Eisenberg and colleagues (1998) suggest that emotion is socialized in three

potential ways: parents' expression of emotion, their reaction to emotion, and discussion of emotion. This thesis concerns the rating of anger expression, showing that interparental expressed anger is particularly important for the developing infant. Observational studies that measure the expression of anger within parenting, or in the home generally, would provide the data necessary to describe the exact ways by which parents express their anger. Parent-infant interaction data would be most relevant to measuring the nature of parents' reaction to their infants' anger. Maternal reactions to the displays of anger than often occur in response to a frustrating event, such as being placed in a car seat, or the removal of a toy, would provide a suitable context for this observation. The relevance of the discussion of anger may be better suited to observation later in infancy or in toddlerhood, providing developing children with certain tools to label and regulate anger. Together, smaller studies of an observational nature, concerning these three potential transmission methods, would provide the data necessary to describe how parental anger impacts the infant in direct ways, with potential room for the development of intervention programmes that go well beyond the scope of this thesis.

7.5 Final Conclusions

The findings in the thesis highlight a need for the consideration of anger as a salient factor both within the transition to parenthood and for the developing infant. Current investigations into the transition to parenthood measure aspects such as conflict and dissatisfaction between partners; the data here suggest that a more detailed view at the level of emotion may prove illuminating in tracing the successful adaptation to becoming a new parent, including its relevance to mental health. Similarly, whilst research into the development of anger is regaining strength, little is known about the determinants of its

development. The research contained in this thesis suggests that mothers and fathers own anger are pivotal in predicting the development of anger in their offspring, and that further research identifying the exact processes of transmission and conditions of socialization would be ideal to develop this knowledge further.

REFERENCES

- Alpert, J., Petersen, T., Roffi, P., Papakostas, G., Freed, R., Smith, M., . . . Fava, M. (2003). Behavioural and emotional disturbances in the offspring of depressed parents with anger attacks. *Psychotherapy and Psychosomatics*, *72*, 102-106.
- Aristotle. (1953). *The Nicomachean Ethics/ translated by J.A.K. Thomson*. London: Allen and Unwin.
- American Psychological Association (2009). *Controlling anger - before it controls you*. Retrieved June 20th, 2009
- Averill, J. R. (1982). *Anger and Aggression: An Essay on Emotion*. New York: Spring-Verlag.
- Averill, J. R. (1983). Studies on anger and aggression: Implications for theories of emotion. *American Psychologist*, *38*, 1145-1160.
- Averill, J. R. (1993). Illusions of anger. In R. B. Felson & J. T. Tedeschi (Eds.), *Aggression and violence: Social interactionist perspectives* (pp. 171-192). Washington DC: American Psychological Association.
- Baldwin, W. (1993). The consequences of early childbearing: A perspective. *Journal of Research on Adolescence*, *3*, 349-353.
- Balsamo, M. (2010). Anger and depression: Evidence of a possible mediating role for rumination. *Psychological Reports*, *106*, 3-12.
- Barber, J. S., Axinn, W. G., & Thornton, A. (1999). Unwanted childbearing, health, and mother-child relationships. *Journal of Health and Social Behavior*, *40*(3), 231-257.
- Bardwell, W. A., Berry, C. C., Ancoli-Israel, S., & Dimsdale, J. E. (1999). Psychological correlates of sleep apnea. *Journal of Psychosomatic Research*, *47*, 583-596.

- Barry, R. A., & Kochanska, G. (2010). A longitudinal investigation of the affective environment in families with young children: From infancy to early school age. *Emotion, 10*, 237-249.
- Bates, J. E. & Bayles, K. (1984). Objective and subjective components in mothers' perceptions of their children from age 6 months to 3 years. *Merrill-Palmer Quarterly, 30*, 111-130.
- Beck, C. T. (1996). Postpartum depressed mothers' experiences interacting with their children. *Nursing Research, 45*, 98-104.
- Beck, C. (2001). Predictors of postpartum depression. *Nursing Research, 50*, 275-285.
- Behringer, J., Reiner, I., & Spangler, G. (2011). Maternal representations of past and current attachment relationships, and emotional experiences across the transition to motherhood: A longitudinal study. *Journal of Family Psychology, 25*, 210-219.
- Bei, B., Milgrom, J., Ericksen, J., & Trinder, J. (2010). Subjective perception of sleep, but not its objective quality, is associated with immediate postpartum mood disturbances in healthy women. *Sleep, 33*, 531-538.
- Belsky, J., Lang, M. E., & Rovine, M. (1985). Stability and change in marriage across the transition to parenthood - a 2nd study. *Journal of Marriage and the Family, 47*(4), 855-865.
- Belsky, J., & Pensky, E. (1988). Marital change across the transition to parenthood. *Marriage and Family Review, 12*, 133-156.
- Belsky, J., & Rovine, M. (1990). Patterns of change across the transition to parenthood: Pregnancy to three years postpartum. *Journal of Marriage and Family, 52*, 5-19.
- Belsky, K., & Kelly, J. (1994). *The transition to parenthood: How a first child changes a marriage: why some couples grow closer and others apart*. New York: Delacorte Press.

- Bennett, H. A., Einarson, A., Taddio, A., Koren, G., & Einarson, T. R. (2004). Prevalence of depression during pregnancy: Systematic review. *Obstetrics and Gynecology*, *103*(4), 698-709.
- Berscheid, B. E. & Ammazalorso, A. H. (2004). Emotional experiences in close relationships. In M. B. Brewer & M. Hewstone (Eds.), *Emotion and Motivation* (pp.47-69). Malden, MA, US: Blackwell.
- Bettencourt, A. B., & Miller, N. (1996). Gender differences in aggression as a function of provocation: A meta-analysis. *Psychological Bulletin*, *119*, 422-447.
- Bianchi, S. M., Robinson, J. P., & Milkie, M. A. (2006). *Changing Rhythms of American Family Life*. New York: Russell Sage.
- Bies, R. J. & Tripp, T. M. (1996). Beyond distrust: “getting even” and the need for revenge. In R. M. Kramer, T. R. Tyler (Eds.), *Trust in Organizations: Frontiers of theory and research*, (pp 246-260). Thousand Oaks, CA, US: Sage.
- Bird, C. E. (1999). Gender, household labor, and psychological distress: The impact of the amount and division of housework. *Journal of Health and Social Behaviour*, *40*, 32-45.
- Birkeland, R., Thompson, J. K., & Phares, V. (2005). Adolescent motherhood and postpartum depression. *Journal of Clinical Child and Adolescent Psychology*, *34*, 292 - 300.
- Bishop, G. D., & Quah, S. (1998). Reliability and validity of measures of anger/hostility in Singapore: Cook & Medley Ho Scale, STAXI and Buss-Durkee hostility inventory. *Personality and Individual Differences*, *24*, 867-878.
- Braiker, H. B., & Kelly, H. H. (1979). Conflict in the development of close relationships. In R. L. Burgess & T. L. Huston (Eds.), *Social Exchange in Developing Relationships*. New York: Academic Press.

- Brame, B., Nagin, D. S., & Tremblay, R. E. (2001). Developmental trajectories of physical aggression from school entry to late adolescence. *Journal of Child Psychology and Psychiatry*, 42, 503 - 512.
- Braungart-Rieker, J. M., & Stifter, C. A. (1996). Infants' responses to frustrating situations: Continuity and change in reactivity and regulation. *Child Development*, 67, 1767-1779.
- Breen, D. (1975). *The Birth of a First Child: Towards and Understanding of Femininity*. London: Tavistock.
- Breslau, N., Roth, T., Rosenthal, L., & Andreski, P. (1996). Sleep disturbance and psychiatric disorders: A longitudinal epidemiological study of young adults. *Biological Psychiatry*, 39(6), 411-418.
- Bridges, K. M. (1932). Emotional development in early infancy. *Child Development*, 3, 324-341.
- Briscoe, C. W., & Smith, J. B. (1973). Depression and marital turmoil. *Archives of General Psychiatry*, 29(6), 811-817.
- Brody, C. L., Haaga, D. A. F., Kirk, L., & Solomon, A. (1999). Experiences of anger in people who have recovered from depression and never-depressed people. *Journal of Nervous and Mental Disease*, 187(7), 400-405.
- Brown, S. L., & Booth, A. (1996). Cohabitation versus marriage: A comparison of relationship quality. *Journal of Marriage and the Family*, 58(3), 668-678.
- Bruehl, S., Liu, X. X., Burns, J. W., Chont, M., & Jamison, R. N. (2012). Associations between daily chronic pain intensity, daily anger expression, and trait anger expressiveness: An ecological momentary assessment study. *Pain*, 153(12), 2352-2358.

- Brugha, T., Conroy, R., Walsh, N., Delaney, W., Ohanlon, J., Dondero, E., . . . Bourke, G. (1982). Social networks, attachments and support in minor affective disorders- a replication. *British Journal of Psychiatry, 141*, 249-255.
- Buss, A., & Plomin, R. *Temperament: Early Developing Personality Traits*. Hillsdale, NJ: Erlbaum.
- Buss, A., & Plomin, R. (1984). *Temperament: Early Developing Personality Traits*. Hillsdale, NJ: Erlbaum.
- Caldwell, C. H., Antonucci, T. C., Jackson, J. S., Wolford, M. L., & Osofsky, J. D. (1997). Perceptions of parent support and depressive symptomatology among black and white adolescent mothers. *Journal of Emotional and Behavioral Disorders, 5*, 173-183.
- Campbell, S. B., & Cohn, J. F. (1991). Prevalence and correlates of postpartum depression in first-time mothers. *Journal of Abnormal Psychology, 100*, 594-599.
- Camras, L. A., Oster, H., Campos, J. J., Miyake, K., & Bradshaw, D. (1992). Japanese and American infants' responses to arm restraint. *Developmental Psychology, 28*, 578-583.
- Carter, A. S., Garrity-Rokous, F. E., Chazan-Cohen, R., Little, C., & Briggs-Gowan, M. J. (2001). Maternal depression and comorbidity: Predicting early parenting, attachment security, and toddler social-emotional problems and competencies. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*, 18-26.
- Carver, C. S., Johnson, S. L., & Joormann, J. (2008). Serotonergic Function, Two-Mode Models of Self-Regulation, and Vulnerability to Depression: What Depression Has in Common With Impulsive Aggression. *Psychological Bulletin, 134*, 912-943.
- Caseras, X., Garner, M., Bradley, B. P., & Mogg, K. (2007). Biases in visual orienting to negative and positive scenes in dysphoria: An eye movement study. *Journal of Abnormal Psychology, 116*, 491-497.

- Caska, C. M., Hendrickson, B. E., Wong, M. H., Ali, S., Neylan, T., & Whooley, M. A. (2009). Anger expression and sleep quality in patients with coronary heart disease: Findings from the Heart and Soul Study. *Psychosomatic Medicine, 71*, 280-285.
- Caspi, A. (1987). Personality in the life course. *Journal of Personality and Social Psychology, 53*, 1203-1213.
- Caspi, A., Elder, G. H., & Bem, D. J. (1987). Moving against the world: Life-course patterns of explosive children. *Developmental Psychology, 23*, 308-313.
- Cerezo, M. A., Pons-Salvador, G., & Trenado, R. M. (2008). Mother-infant interaction and children's socio-emotional development with high- and low-risk mothers. *Infant Behavior and Development, 31*, 578-589.
- Chang, P. P., Ford, D. E., Mead, L. A., CooperPatrick, L., & Klag, M. J. (1997). Insomnia in young men and subsequent depression - The Johns Hopkins Precursors Study. *American Journal of Epidemiology, 146*, 105-114.
- Chaplin, T. M., Cole, P. M., & Zahn-Waxler, C. (2005). Parental Socialization of emotion expression: Gender differences and relations to child adjustment. *Emotion, 5*, 80-88.
- Christensen, A. L., Stuart, E. A., Perry, D. F., & Le, H. N. (2011). Unintended Pregnancy and Perinatal Depression Trajectories in Low-Income, High-Risk Hispanic Immigrants. *Prevention Science, 12*, 289-299.
- Cohan, C. L., & Brabury, T. N. (1997). Negative life events, marital interaction, and the longitudinal course of newlywed marriage. *Journal of Personality and Social Psychology, 73*, 114-128.
- Cohn, J. F., Campbell, S. B., Matias, R., & Hopkins, J. (1990). Face-to-face interactions of postpartum depressed and nondepressed mother-infant pairs at 2 months. *Developmental Psychology, 26*, 15-23.

- Costa, P. T., & McCrae, R. R. (1988). Personality in adulthood - a six-year longitudinal study of self-reports and spouse ratings on the Neo Personality Inventory. *Journal of Personality and Social Psychology, 54*, 853-863.
- Cowan, P. A., & Cowan, C. P. (1988). Changes in marriage during the transition to parenthood: Must we blame the baby? In G. Y. Michael & W. A. Goldberg (Eds.), *The Transition to Parenthood* (Vol. 12, pp. 114-154). New York: Cambridge University Press.
- Cowan, C. P., & Cowan, P. A. (1995). Interventions to ease the transition to parenthood - why they are needed and what they can do. *Family Relations, 44*, 412-423.
- Cox, M. J., Paley, B., Burchinal, M., & Payne, C. (1999). Marital perceptions and interactions across the transition to parenthood. *Journal of Marriage and the Family, 61*, 611-625.
- Crockenberg, S. (1987). Predictive and correlated of anger toward and punitive control of toddlers by adolescent. *Child Development, 58*, 964-975.
- Crockenberg, S. C., & Leerkes, E. M. (2006). Infant and maternal behavior moderate reactivity to novelty to predict anxious behavior at 2.5 years. *Development and Psychopathology, 18*, 17-34.
- Crockenberg, S. C., Leerkes, E. M., & Barrig Jo, P. S. (2008). Predicting aggressive behavior in the third year from infant reactivity and regulation as moderated by maternal behavior. *Development and Psychopathology, 20*, 37-54.
- Crockenberg, S. C., Leerkes, E. M., & Lekka, S. K. (2007). Pathways from marital aggression to infant emotion regulation: The development of withdrawal in infancy. *Infant Behavior and Development, 30*, 97-113.

- Crohan, S. E. (1996). Marital quality and conflict across the transition to parenthood in African American and white couples. *Journal of Marriage and the Family*, 58, 933-944.
- Cummings, E. M., Ballard, M., Elsheikh, M., & Lake, M. (1991). Resolution and children's responses to interadult anger. *Developmental Psychology*, 27, 462-470.
- Cummings, E. M. (1994). Marital conflict and children's functioning. *Social Development*, 3, 16-36.
- Cummings, E. M., Iannotti, R., & Zahn-Waxler, C. (1985). The influence of conflict between adults on the emotions and aggression of young children. *Developmental Psychology*, 21, 495-507.
- Cummings, E. M., Zahn-Waxler, C., & Radke-Yarrow, M. (1981). Young children's responses to expressions of anger and affection by others in the family. *Child Development*, 52, 1274-1282.
- Cummings, E. M., Goeke-Morey, M. C., & Papp, L. M. (2003). Children's responses to everyday marital conflict tactics in the home. *Child Development*, 74, 1918-1929.
- Cummings, E. M., Kouros, C. D., & Papp, L. M. (2007). Marital aggression and children's responses to everyday interparental conflict. *European Psychologist*, 12, 17-28.
- Cutrona, C. E. (1983). Causal attributions and perinatal depression, *Journal of Abnormal Psychology*, 92, 161-172.
- Darwin, C. (1872). *The Expression of the Emotions in Man and Animals*. London: John Murray.
- Davies, P. T., Myers, R. L., & Cummings, E. M. (1995). Responses of children and adolescents to marital conflict scenarios as a function of the emotionality of conflict endings. *Merrill-Palmer Quarterly*, 42, 1-21.

- Davies, P. T., Sturge-Apple, M. L., Winter, M. A., Cummings, E. M., & Farrell, D. (2006). Child adaptational development in contexts of interparental conflict over time. *Child Development, 77*, 218-233.
- de Bruij, A. T., van Bakel, H. J., & van Baar, A. L. (2009). Sex differences in the relationship between prenatal maternal emotional complaints and child outcome. *Early Human Development, 85*, 319-324.
- Deffenbacher, J. L., Oetting, E. R., Thwaites, G. A., Lynch, R. S., Baker, D. A., Stark, R. S., . . . Eiswerth Cox, L. (1996). State-trait anger theory and the utility of the trait anger scale. *Journal of Counselling Psychology, 43*, 131-148.
- Denham, S. A. (1993). Maternal emotional responsiveness and toddlers' social-emotional competence. *Journal of Child Psychology and Psychiatry, 34*, 715-728.
- Derogatis, L. R. (1975). *The Affect Balance Scale*. Baltimore: Clinical Psychometric Research.
- Diego, M., Field, T., Jones, N. A., & Hernandez-Reif, M. (2006). Withdrawn and intrusive maternal interaction style and infant frontal EEG asymmetry shifts in infants of depressed and non-depressed mothers. *Infant Behavior and Development, 29*, 220-229.
- Dix, T. (1991). The affective organization of parenting: Adaptive and maladaptive processes. *Psychological Bulletin, 110*, 3-25.
- Donzella, B., Gunnar, M. R., Krueger, W. K., & Alwin, J. (2000). Cortisol and vagal tone responses to competitive challenge in preschoolers: Associations with temperament. *Developmental Psychobiology, 37*, 209-220.
- Dorheim, S. K., Bondevik, G. T., Eberhard-Gran, M., & Bjorvatn, B. (2009). Sleep and depression in postpartum women: A population based study. *Sleep, 32*, 847-855.

- Du Fort, G. G., Boothroyd, L. J., Bland, R. C., Newman, S. C., & Kakuma, R. (2002). Spouse similarity for antisocial behaviour in the general population. *Psychological Medicine*, 32, 1407-1416.
- Dyer, E. D. (1963). Parenthood as crisis. A re-study. *Journal of Marriage and Family Living*, 25, 196-201.
- Eaton, W. W., Badawi, M., & Melton, B. (1995). Prodromes and precursors - epidemiologic data for primary prevention of disorders with slow onset. *American Journal of Psychiatry*, 152, 967-972.
- Eckhardt, C., Norlander, B., & Deffenbacher, J. L. (2004). The assessment of anger and hostility: a critical review. *Aggression and Violent Behavior*, 9, 17-43.
- Eisenach, J. C., Pan, P. H., Smiley, R., Lavand'homme, P., Landau, R., & Houle, T. T. (2008). Severity of acute pain after childbirth, but not type of delivery, predicts persistent pain and postpartum depression. *Pain*, 140, 87-94.
- Eisenberg, N., Cumberland, A., & Spinrad, T. L. (1998). Parental socialization of emotion. *Psychological Inquiry*, 9, 241-273.
- Elias, P., McKnight, A., & Kinshott, G. (1999) *SOC2000: Redefining skill: Revision of the Standard Classification System*, Skills Task Force Research Paper 19.
- Emde, R. N., Gaensbauer, T. J., & Harmon, R. J. (1976). Emotional expression in infancy; a biobehavioural study. *Psychological Issues*, 20, 1-200.
- Evans, J., Heron, J., Francomb, H., Oke, S., & Golding, J. (2001). Cohort study of depressed mood during pregnancy and after childbirth. *British Medical Journal*, 323, 257-260.
- Fantuzzo, J., Boruch, R., Beriama, A., Atkins, M., & Marcus, S. (1997). Domestic violence and children: Prevalence and risk in five major US cities. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 116-122.

- Fava, M., Anderson, K., & Rosenbaum, J. F. (1990). Anger attacks - possible variants of panic and major depressive disorder. *American Journal of Psychiatry*, *147*(7), 867-870.
- Fava, M., & Rosenbaum, J. (1998). Anger attacks in depression. *Depression and Anxiety*, *8*, 59-63.
- Feinmann, S. (1992). *Social referencing and the social construction of reality in infancy*. New York: Plenum.
- Fernald, A. (1993). Approval and disapproval - infant responsiveness to vocal affect in familiar and unfamiliar languages. *Child Development*, *64*, 657-674.
- Fessler, D. M. T. (2010). Madmen: An evolutionary perspective on anger and men's violent responses to transgression. In M. Potegal, G. Stemmler & C. Spielberger (Eds.), *International Handbook of Anger* (pp. 361-384). New York: Springer.
- Field, T. (2002). Prenatal effects of maternal depression. In S. H. Goodman, I. H. Gotlib (Ed.), *Children of Depressed Parents: Mechanisms of risk and implications for treatment*. (pp 59-88). Washington DC: American Psychological Association.
- Field, T. (2011). Prenatal depression effects on early development: A review. *Infant Behavior and Development*, *34*, 1-14.
- Field, T., Diego, M., Hernandez-Reif, M., Figueiredo, B., Deeds, O., Contogeorgos, J., & Ascencio, A. (2006). Prenatal paternal depression. *Infant Behavior & Development*, *29*, 579-583.
- Field, T., Hernandez-Reif, M., Vera, Y., Gil, K., Diego, M., Bendell, D., & Yando, R. (2005). Anxiety and anger effects on depressed mother-infant spontaneous and imitative interaction. *Infant Behavior and Development*, *28*, 1-9.
- Fischer, K. W., Shaver, P. R., & Carnochan, P. (1990). How emotions develop and how they organise development. *Cognition and Emotion*, *4*, 81-87.

- Freud, S. (1917). Mourning and Melancholia. In J. Strachey (Ed.), *The Standard Edition of the Complete Psychological Works of Sigmund Freud* (Vol. 14, pp. 239-258): Hogarth Press.
- Frings, C., Wentura, D., & Holtz, M. (2007). Dysphorics cannot ignore unpleasant information. *Cognition & Emotion*, *21*, 1525-1534.
- Frost, D. W., & Averill, J. R. (1982). Differences between men and women in the everyday experience of anger. In J. R. Averill (Ed.), *Anger and Aggression* (pp. 281-315). New York: Springer-Verlag.
- Fuma, M. (2005). Macro-level gender inequality and the division of household labor in 22 countries. *American Sociological Review*, *69*, 751-767.
- Funabiki, D., Bologna, N., Pepping, M., & Fitzgerald, K. (1980). Revisiting sex differences in the expression of depression. *Journal of Abnormal Psychology*, *89*, 194-202.
- Galambos, N. L., Barker, E. T., & Krahn, H. J. (2006). Depression, self-esteem, and anger in emerging adulthood: Seven-year trajectories. *Developmental Psychology*, *42*, 350-365.
- Galambos, N. L., & Krahn, H. J. (2008). Depression and anger trajectories during the transition to adulthood. *Journal of Marriage and the Family*, *70*, 15-27.
- Gavin, N. I., Gaynes, B. N., Lohr, K. N., Meltzer-Brody, S., Gartlehner, G., & Swinson, T. (2005). Perinatal depression - A systematic review of prevalence and incidence. *Obstetrics and Gynecology*, *106*, 1071-1083.
- Gjerde, P. F., & Westenberg, P. M. (1998). Dysphoric adolescents as young adults: A prospective study of the psychological sequelae of depressed mood in adolescence. *Journal of Research on Adolescence*, *8*, 377-402.
- Goldberg, A. E., & Sayer, A. (2006). Lesbian couples' relationships quality across the transition to parenthood. *Journal of Marriage and the Family*, *68*, 87-100.

- Goldman, L., & Haaga, D. (1995). Depression and the experience and expression of anger in marital and other relationships. *Journal of Nervous and Mental Disease, 183*, 505-509.
- Gottman, J. M. (1994). *What predicts divorce?* Hillsdale, NJ: Lawrence Erlbaum Associates.
- Gottman, J., Levenson, R., & Woodin, E. (2001). Facial expressions during marital conflict. *Journal of Family Communication, 1*, 37 -57.
- Gould, R. A., Ball, S., Kaspi, S. P., Otto, M. W., Pollack, M. H., Shekhar, A., & Fava, M. (1996). Prevalence and correlates of anger attacks: A two site study. *Journal of Affective Disorders, 39*, 31-38.
- Graham, J. E., Lobel, M., & DeLuca, R. S. (2002). Anger after childbirth: an overlooked reaction to postpartum stressors. *Psychology of Women Quarterly, 2002*, 222-233.
- Gutke, A., Josefsson, A., & Oberg, B. (2007). Pelvic girdle pain and lumbar pain in relation to postpartum depressive symptoms. *Spine, 32*, 1430-1436.
- Halligan, S. L., Murray, L., Martins, C., & Cooper, P. J. (2007). Maternal depression and psychiatric outcomes in adolescent offspring. *Journal of Affective Disorders, 97*, 145-154.
- Hamilton, M. (1989). Frequency of symptoms in melancholia (depressive-illness). *British Journal of Psychiatry, 154*, 201-206.
- Harmon-Jones, E., Peterson, C. K., & Harmon-Jones, C. (2010). Anger, motivation, and asymmetrical frontal cortical activations. In M. Potegal, G. Stemmler & C. Spielberger (Eds.), *International Handbook of Anger* (pp. 61-78). New York, NY: Springer.
- Haviland, J. M., & Lelwica, M. (1987). The induced affect response: 10-week-old infants' responses to three emotional expressions. *Developmental Psychology, 23*, 97-104.

- Hay, D. F., Castle, J., & Davies, L. (2000). Toddlers' use of force against familiar peers: A precursor of serious aggression? *Child Development, 71*, 457-467.
- Hay, D. F., Pawlby, S., Angold, A., Harold, G. T., & Sharp, D. (2003). Pathways to violence in the children of mothers who were depressed postpartum. *Developmental Psychology, 39*, 1083-1094.
- Hay, D. F., Pawlby, S., Waters, C. S., Perra, O., & Sharp, D. (2010). Mothers' antenatal depression and their children's antisocial outcomes. *Child Development, 81*, 149-165.
- Hay, D. F., Perra, O., Hudson, K., Waters, C. S., Mundy, L., Phillips, R., . . . Team, C. (2010). Identifying Early Signs of Aggression: Psychometric Properties of the Cardiff Infant Contentiousness Scale. *Aggressive Behavior, 36*, 351-357.
- Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modelling [White paper]. Retrieved from <http://www.afhayes.com/public/process2012.pdf>
- Heyman, R. E. (2001). Observation of couple conflict: Clinical assessment applications, stubborn truths, and shaky foundations. *Psychological Assessment, 13*, 5 – 35.
- Hobfoll, S. E., Ritter, C., Lavin, J., Hulsizer, M. R., & Cameron, R. P. (1995). Depression prevalence and incidence among inner-city pregnant and postpartum women. *Journal of Consulting and Clinical Psychology, 63*, 445-453.
- Hodapp, V., Heiligtag, U., & Stomer, S. W. (1990). Cardiovascular reactivity, anxiety and anger during perceived controllability. *Biological Psychology, 30*, 161-170.
- Hofferth, S. L., & Moore, K. A. (1979). Early childbearing and later economic wellbeing. *American Sociological Review, 44*, 784-815.
- Huot, R. L., Brennan, P. A., Stowe, Z. N., Plotsky, P. M., & Walker, E. F. (2004). Negative affect in offspring of depressed mothers is predicted by infant cortisol levels at 6

- months and maternal depression during pregnancy, but not postpartum. *Annals of the New York Academy of Sciences*, 1032, 234-236.
- Ingram, R. E., Trenary, L., Odom, M., Berry, L., & Nelson, T. (2007). Cognitive, affective and social mechanisms in depression risk: Cognition, hostility, and coping style. *Cognition & Emotion*, 21, 78-94.
- Izard, C. E. (1991). *The psychology of emotions*. New York: Plenum Press.
- Izard, C. E. (1977). *Human Emotions*. New York: Plenum Press.
- Izard, C. E., Dougherty, L. M. & Hembree, E. A. (1983). *A system for identifying affect expressions by holistic judgements (Affex)*. Instructional Resources Centre, University of Delaware.
- Izard, C. E., Hembree, E. A., & Huebner, R. R. (1987). Infants' emotion expressivity to acute pain: Developmental change and stability of individual differences. *Developmental Psychology*, 23, 105-113.
- Izard, C. E., & Malatesta, C. Z. (1987). Perspectives on emotional development I: Differential emotions theory of early emotional development. In J. D. Osofsky (Ed.), *Handbook of infant development* (pp. 494-554). New York: Wiley-Interscience.
- Jenkins, J. M. (2000). Marital conflict and children's emotions: The development of an anger organization. *Journal of Marriage and the Family*, 62, 723-736.
- Jenkins, J. M., & Oatley, K. (2000). Psychopathology and short-term emotion: The balance of affects. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 41, 463-472.
- Jenkins, J. M., Shapka, J. D., & Sorenson, A. M. (2006). Teenage mothers' anger over twelve years: Partner conflict, partner transitions and children's anger. *Journal of Child Psychology and Psychiatry*, 47, 775-782.

- Jenkins, J. M., & Smith, M. A. (1991). Marital disharmony and children's behaviour problems: Aspects of a poor marriage which affect children adversely. *Journal of Child Psychology and Psychiatry*, 32, 793-810.
- Julien, D., Markman, H. J., & Lindahl, K. M. (1989). A comparison of global and microanalytic coding systems: Implications for future trends in studying interactions. *Behavioral Assessment*, 11, 81-100.
- Kassinove, H. (1995). *Anger disorders: Definition, diagnosis, and treatment*. Washington: Taylor & Francis.
- Kitamura, T., Shima, S., Sugawara, M., & Toda, M. A. (1996). Clinical and psychosocial correlates of antenatal depression: A review. *Psychotherapy and Psychosomatics*, 65, 117-123.
- Kitamura, T., Sugawara, M., Sugawara, K., Toda, M. A., & Shima, S. (1996). Psychosocial study of depression in early pregnancy. *British Journal of Psychiatry*, 168, 732-738.
- Kluwer, E. S., & Johnson, M. D. (2007). Conflict frequency and relationship quality across the transition to parenthood. *Journal of Marriage and Family*, 69, 1089-1106.
- Kobiella, A., Grossman, T., Reid, V. M., & Striano, T. (2008). The discrimination of angry and fearful facial expressions in 7-month old infants: An event-related potential study. *Cognition and Emotion*, 22, 134-146.
- Kopper, B. A., & Epperson, D. L. (1991). Women and anger - sex and sex-role comparisons in the expression of anger. *Psychology of Women Quarterly*, 15, 7-14.
- Krueger, R. F., Moffitt, T. E., Caspi, A., Bleske, A., & Silva, P. A. (1998). Assortative mating for antisocial behavior: Developmental and methodological implications. *Behavior Genetics*, 28, 173-186.
- Kumar, R., & Robson, K. M. (1984). A prospective-study of emotional disorders in childbearing women. *British Journal of Psychiatry*, 144, 35-47.

- Laughrea, K., Belanger, C., Wright, J., & McDuff, P. (1997). The study of anger within marital relationships. *International Journal of Psychology*, *32*, 155-167.
- Lazarus, R. S. (1991). *Emotion and adaptation*. London: Oxford University Press.
- LeMasters, E. E. (1957). Parenthood as crisis. *Marriages and Family Living*, *19*, 352-355.
- Lemerise, E. A., & Dodge, K. A. (1993). The development of anger and hostile interactions. In M. Lewis & J. M. Haviland (Eds.), *Handbook of Emotions* (pp. 537-546). New York: Guilford Press.
- Lewis, C., & Lamb, M. E. (2003). Fathers' influences on children's development: The evidence from two-parent families. *European Journal of Psychology of Education*, *18*, 211-228.
- Lewis, M. (2010). The Development of Anger. In M. Potegal, G. Stemmler & C. Spielberger (Eds.), *International Handbook of Anger*. New York: Springer.
- Lewis, M., Alessandri, S. M., & Sullivan, M. W. (1990). Violation of expectancy, loss of control, and anger expressions in young infants. *Developmental Psychology*, *26*, 745-751.
- Lewis, M., & Ramsay, D. (2005). Infant emotional and cortisol responses to goal blockage. *Child development*, *76*, 518-530.
- Lewis, M., Ramsay, D., & Sullivan, M. W. (2006). The relation of ANS and HPA activation to infant anger and sadness response to goal blockage. *Developmental Psychobiology*, *48*, 397-405.
- Lewis, M., Sullivan, M. W., Ramsay, D. S., & Alessandri, S. M. (1992). Individual-differences in anger and sad expressions during extinction – antecedents and consequences. *Infant Behavior & Development*, *15*, 443-452.
- Lindahl, K. M., Markman, H. J. (1991). System for coding Affect Regulation in the Family (SCARF). Denver, CO: Authors.

- Lindahl, K. M., Clements, M., & Markman, H. J. (1997). Predicting marital and parents functioning in dyads and triads: A longitudinal investigation of marital processes. *Journal of Family Psychology, 11*, 139 – 151.
- Litvak, P. M., Lerner, J. S., Tiedens, L. Z., & Shork, K. (2010). Fuel in the fire: How anger impacts judgment and decision-making. In M. Potegal, G. Stemmler & C. Spielberger (Eds.), *International Handbook of Anger* (pp. 287-310). New York: Springer.
- Loeber, R., & Stouthamer-Loeber, M. (1998). Development of juvenile aggression and violence - Some common misconceptions and controversies. *American Psychologist, 53*, 242-259.
- Loranger, A. W., Sartorius, N., Andreoli, A., Berger, P., Buchheim, P., Channabasavanna, S. M., . . . Regier, D. A. (1994). The International Personality-Disorder Examination - The World-Health-Organization alcohol, drug-abuse, and mental-health administration international pilot-study of personality disorders. *Archives of General Psychiatry, 51*, 215-224.
- Luoma, I., Kaukonen, P., Mantymaa, M., Puura, K., Tamminen, T., & Salmelin, R. (2004). A longitudinal study of maternal depressive symptoms, negative expectations and perceptions of child problems. *Child Psychiatry & Human Development, 35*, 37-53.
- Luoma, I., Tamminen, T., Kaukonen, P., Laippala, P., Puura, K., Salmelin, R., & Almqvist, F. (2001). Longitudinal study of maternal depressive symptoms and child well-being. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*, 1367-1374.
- Macdermid, S. M., Huston, T. L., & McHale, S. M. (1990). Changes in marriage associated with the transition to parenthood - individual-differences as a function of sex-role attitudes and changes in the division of household labour. *Journal of Marriage and the Family, 52*, 475-486.

- Mahoney, A., Jouriles, E. N., & Scavone, J. (1997). Marital adjustment, marital discord over childrearing, and child behavior problems: Moderating effects of child age. *Journal of Clinical Child Psychology, 26*, 415-423.
- Malatesta, C. Z., & Wilson, A. (1988). Emotion/cognition interaction in personality development: A discrete emotions, functionalist analysis. *British Journal of Social Psychology, 27*, 91-112.
- Malatesta-Magai, C., Shepard, B., Jonas, R., & Culver, L. C. (1992). Type-A behavior pattern and emotion expression in younger and older adults. *Psychology and Aging, 7*, 551-561.
- Mammen, O., Shear, M. K., Pilkonis, P., Kolko, D., Thase, M., & Greeno, C. (1999). Anger attacks: correlated and significance of an underrecognized symptom. *Journal of Clinical Psychiatry, 60*, 633-642.
- Mantymaa, M., Puura, K., Luoma, I., Salmelin, R. K., & Tamminen, T. (2004). Early mother-infant interaction, parental mental health and symptoms of behavioral and emotional problems in toddlers. *Infant Behavior and Development, 27*, 134-149.
- Marques, M., Bos, S., Soares, M. J., Maia, B., Pereira, A. T., Valente, J., . . . Azevedo, M. H. (2011). Is insomnia in late pregnancy a risk factor for postpartum depression/depressive symptomatology. *Psychiatry Research, 186*, 272-280.
- Mattessich, P., & Hill, R. (1987). Life cycle and family development. In M. B. Sussman & S. K. Steinmetz (Eds.), *Handbook of Marriage and the Family* (Vol. 13, pp. 437-469). New York: Plenum Press.
- McAdams, D. P., & Olson, B. D. (2010). Personality Development: Continuity and Change Over the Life Course *Annual Review of Psychology* (Vol. 61, pp. 517-542). Palo Alto: Annual Reviews.

- Melby, J. N., Conger, R. D., Ge, X. J., & Warner, T. D. (1995). The use of structural equation modelling in assessing the quality of marital observations. *Journal of Family Psychology, 9*, 280-293.
- Milgrom, J., Gemmill, A. W., Bilszta, J. L., Hayes, B., Barnett, B., Brooks, J., . . . Buist, A. (2008). Antenatal risk factors for postnatal depression: A large prospective study. *Journal of Affective Disorders, 108*, 147-157.
- Mirowsky, J. & Ross, C. E. (1995). Sex differences in distress: Real or artifact? *American Sociological Review, 60*, 449-468.
- Monk, T. H., Essex, M. J., Smider, N. A., Klein, M. H., Lowe, K. K., & Kupfer, D. J. (1996). The impact of the birth of a baby on the time structure and social mixture of a couple's daily life and its consequences for well-being. *Journal of Applied Social Psychology, 26*, 1237-1258.
- Moore, G. A. (2010). Parent conflict predicts infants' vagal regulation in social interaction. *Development and Psychopathology, 22*, 23-33.
- Moreno, J., Fuhriman, A., & Selby, M. (1993). Measurement of hostility, anger and depression in depressed and nondepressed subjects. *Journal of Personality Assessment, 61*, 511-523.
- Moscardino, U., & Axia, G. (2006). Infants' responses to arm restraint at 2 and 6 months: a longitudinal study. *Infant Behavior and Development, 29*, 59-69.
- Murray, L., & Cartwright, W. (1993). The role of obstetric risk factors in postpartum depression. *Journal of Reproductive and Infant Psychology, 11*, 215-219.
- Naerde, A., Roysamb, E., & Tambs, K. (2004). Temperament in adults - Reliability, stability, and factor structure of the EAS temperament survey. *Journal of Personality Assessment, 82*, 71-79.

- O' Hara, M. W., Rehm, L. P., & Campbell, S. B. (1982). Predicting depressive symptomatology: Cognitive-behavioral models and postpartum depression. *Journal of Abnormal Psychology, 91*, 457-461.
- O'Mahen, H. A., Flynn, H. A., & Nolen-Hoeksema, S. (2010). Rumination and interpersonal functioning in perinatal depression. *Journal of Social and Clinical Psychology, 29*, 646-667.
- Olweus, D. (1979). Stability of aggressive reaction patterns in males – a review. *Psychological Bulletin, 86*, 852-875.
- Osofsky, J. D., & Osofsky, H. J. (1984). Psychological and developmental perspectives on expectant and new parenthood. *Review of Child Development Research, 7*, 372-397.
- Otoni, G., Lorenzi, T., & Lara, D. (2011). Association of temperament with subjective sleep patterns. *Journal of Affective Disorders, 128*, 120-127.
- Owen, J. M. (2011). Transdiagnostic cognitive processes in high trait anger. *Clinical Psychology Review, 31*, 193-202.
- Palkowitz, R. & Sussman, M. (2002). *Transitions to Parenthood*. New York: Haworth.
- Papp, L. M., Cummings, E. M., & Goeke-Morey, M. C. (2002). Marital conflicts in the home when children are present versus absent. *Developmental Psychology, 38*, 774-783.
- Pauli-Pott, U., & Beckmann, D. (2007). On the association of interparental conflict with developing behavioral inhibition and behavior problems in early childhood. *Journal of Family Psychology, 21*, 529-532.
- Pearlin, L. I., & Turner, H. A. (1987). The family as a context of the stress process. In S. V. Kasl & C. L. Cooper (Eds.), *Stress and health: Issues in research methodology* (pp. 143-165). New York: Wiley.
- Piaget, J. (1952). *The origins of intelligence in children*. New York: International Universities Press.

- Pilcher, J. J., Ginter, D. R., & Sadowsky, B. (1997). Sleep quality versus sleep quantity: Relationships between sleep and measures of health, well-being and sleepiness in college students. *Journal of Psychosomatic Research*, *42*, 583-596.
- Porter, C. L., Wouden-Miller, M., Silva, S. S., & Porter, A. E. (2003). Marital harmony and conflict: Links to infants' emotional regulation and cardiac vagal tone. *Infancy*, *4*, 297-307.
- Potegal, M., & Qui, P. (2010). Anger in children's tantrums: A new, quantitative, behaviourally based model. In M. Potegal, G. Stemmler & C. Spielberger (Eds.), *International Handbook of Anger* (pp. 193-217). New York: Springer.
- Potegal, M., Robison, S., Anderson, F., Jordan, C., & Shapiro, E. (2007). Sequence and priming in 15 months-olds' reactions to brief arm restraint: Evidence for a hierarchy of anger responses. *Aggressive Behavior*, *33*, 508-518.
- Potegal, N. & Stemmler, G. (2010). Constructing a neurology of anger. In M. Potegal, G. Stemmler, & C. Spielberger (Eds.), *International Handbook of Anger*. New York: Springer.
- Radke-Yarrow, M., & Kochanska, G. (1990). Anger in young children. In N. L. Stein, B. Levinthal & T. Trabaso (Eds.), *Psychological and biological approaches to emotion* (pp. 297-310). Hillsdale, NJ: Lawrence Erlbaum.
- Renshaw, K. D., Blais, R. K., & Smith, T. W. (2010). Components of negative affectivity and marital satisfaction: The importance of actor and partner anger. *Journal of Research in Personality*, *44*, 328-334.
- Rhoades, K., Leve, L., Harold, G., Neiderheiser, J., & Shaw, D. (2011). Longitudinal pathways from marital hostility to child anger during toddlerhood: Genetic susceptibility and indirect effects via harsh parenting. *Journal of Family Psychology*, *25*, 282-291.

- Rich-Edwards, J. W., Kleinman, K., Abrams, A., Harlow, B. L., McLaughlin, T. J., Joffe, H., & Gillman, M. W. (2006). Sociodemographic predictors of antenatal and postpartum depressive symptoms among women in a medical group practice. *Journal of Epidemiology and Community Health, 60*, 221-227.
- Riemann, D., & Voderholzer, U. (2003). Primary insomnia: a risk factor to develop depression? *Journal of Affective Disorders, 76*, 255-259.
- Riley, W., Treiber, F., & Woods, M. (1989). Anger and hostility in depression. *Journal of Nervous and Mental Disease, 177*, 668-674.
- Robbins, P., & Tanck, R. (1997). Anger and depressed affect: Interindividual and intraindividual perspectives. *Journal of Psychology, 131*, 489-500.
- Rolls, E. (1999). *The Brain and Emotion*. Oxford: Oxford University Press.
- Romano, E., Zoccolillo, M., & Paquette, D. (2006). Histories of child maltreatment and psychiatric disorder in pregnant adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 45*, 329-336 .
- Ross, C., & Van Willigen, M. (1996). Gender, parenthood, and anger. *Journal of Marriage and Family, 58*, 572-584.
- Rothbart, M. K., Ziaie, H., & O'Boyle, C. G. (1992). Self-regulation and emotion in infancy. *Eisenberg, N. And R. A. Fabes* (pp. 7-23).
- Rusting, C. L., & Nolen-Hoeksema, S. (1998). Regulating responses to anger: Effects of rumination and distraction on angry mood. *Journal of Personality and Social Psychology, 74*, 790-803.
- Sanford, K. (2005). Attributions and anger in early marriage: Wives are event-dependent and husbands are schematic. *Journal of Family Psychology, 19*, 180-188.
- Saxbe, D., & Repetti, R. L. (2010). For Better or Worse? Coregulation of Couples' Cortisol Levels and Mood States. *Journal of Personality and Social Psychology, 98*, 92-103.

- Schoebi, D. (2008). The coregulation of daily affect in marital relationships. *Journal of Family Psychology, 22*, 595-604.
- Schudlich, T. D. D., Papp, L. M., & Cummings, E. M. (2011). Relations Between Spouses' Depressive Symptoms and Marital Conflict: A Longitudinal Investigation of the Role of Conflict Resolution Styles. *Journal of Family Psychology, 25*, 531-540.
- Schudlich, T. D. D. R., White, C. R., Fleischhauer, E. A., & Fitzgerald, K. A. (2011). Observed Infant Reactions During Live Interparental Conflict. *Journal of Marriage and Family, 73*, 221-235 .
- Schulz, M. S., Cowan, C. P., & Cowan, P. A. (2006). Promoting healthy beginnings: A randomized control trial of a preventative intervention to preserve marital quality during the transition to parenthood. *Journal of Consulting and Clinical Psychology, 74*, 20-31.
- Schweige, M. S. (1972). Sleep disturbance during pregnancy. A subjective survey. *American Journal of Obstetrics and Gynecology, 114*, 879-882.
- Seligman, M. E. P. (1975). *Helplessness: On depression, development, and death*. New York: W H Freeman.
- Shapiro, A. F., Gottman, J. M., & Carrere, S. (2000). The baby and the marriage: Identifying factors that buffer against decline in marital satisfaction after the first baby arrives. *Journal of Family Psychology, 14*, 59-70.
- Shay, N. L., & Knutson, J. F. (2008). Maternal depression and trait anger as risk factors for escalated physical discipline. *Child Maltreatment, 13*, 39-49.
- Shin, C., Kim, J., Yi, H., Lee, H., Lee, J., & Shin, K. (2005). Relationship between trait-anger and sleep disturbances in middle-aged men and women. *Journal of Psychosomatic Research, 58*, 183-189.

- Siegel, J. M. (1986). The Multidimensional Anger Inventory. *Journal of Social Psychology, 51*, 191 - 200.
- Simpson, J. A., Rholes, W. S., Campbell, L., Tran, S., & Wilson, C. L. (2003). Adult attachment, the transition to parenthood, and depressive symptoms. *Journal of Personality and Social Psychology, 84*, 1172-1187.
- Smith, C. A., Haynes, K. N., Lazarus, R. S., & Pope, L. K. (1993). In search of the hot cognitions - attributions, appraisals, and their relation to emotion. *Journal of Personality and Social Psychology, 65*, 916-929.
- Smith, K. C., Ulch, S. E., Cameron, J. E., Cumberland, J. A., Musgrave, M. A., & Tremblay, N. (1989). Gender-related effects in the perception of anger expression. *Sex Roles, 20*, 487-499.
- Smith, T. W. (1994). Concepts and methods in the study of anger, hostility and health. In A. W. Siegman & T. W. Smith (Eds.), *Anger, hostility and the heart* (pp. 23-42). Hillsdale, NJ: Lawrence Erlbaum.
- Smith, T. W., Glazer, K., Ruiz, J. M., & Gallo, L. C. (2004). Hostility, anger, aggressiveness, and coronary heart disease: An interpersonal perspective on personality, emotion, and health. *Journal of Personality, 72*, 1217-1270.
- Snaith, R. P., Constantopolous, A. A., Jardine, M. Y., & McGuffin, P. (1978). A clinical scale for the self-assessment of irritability. *British Journal of Psychiatry, 132*, 163-171.
- Sperberg, E. D., & Stabb, S. D. (1998). Depression in women as related to anger and mutuality in relationships. *Psychology of Women Quarterly, 22*, 223-238.
- Spiegel, R. (1967). Anger and acting out - masks of depression. *American Journal of Psychotherapy, 21*, 597-606.
- Spielberger, C. D. (1999). *State-trait Anger Expression Inventory-2*. Psychological Assessment Resources.

- Sroufe, L. A. (1996). *Emotional development: The organization of emotional life in the early years*. New York: Cambridge University Press.
- Sroufe, L. A., & Rutter, M. (1984). The domain of developmental psychopathology. *Child development, 55*, 17-29.
- Stenberg, C. R. (1982). *The development of anger facial expressions in infancy*. Unpublished doctoral dissertation. University of Denver, Colorado.
- Stenberg, C. R., Campos, J. J., & Emde, R. N. (1983). The facial expressions of anger in seven-month old infants. *Child Development, 54*, 178-184.
- Stewart, J., Rand, K., Hawkins, M., & Stines, J. (2011). Associations of the shared and unique aspects of positive and negative emotional factors with sleep quality. *Personality and Individual Differences, 50*, 609-614.
- Sullivan, M. W., Lewis, M., & Allesandri, S. M. (1992). Cross-age stability in emotional expressions during learning and extinction. *Developmental Psychology, 28*, 58-63.
- Suzuki, S., Dennerstein, L., Greenwood, K. M., Armstrong, S. M., & Satohisa, E. (1994). Sleep patterns during pregnancy in Japanese women. *Journal of Psychosomatic Obstetrics and Gynecology, 15*, 19-26.
- Szabo, N., Dekovic, M., van Aken, C., Verhoeven, M., van Aken, M. A. G., & Junger, M. (2008). The relations among child negative interactive behaviour, child temperament, and maternal behavior. *Early Childhood Research Quarterly, 23*, 366-377.
- Tan, T. L., Kales, J. D., Kales, A., Soldatos, C. R., & Bixler, E. O. (1984). Biopsychobehavioural correlates of insomnia. 4. Diagnosis based on DSM-III. *American Journal of Psychiatry, 141*, 357-362.
- Teicher, M. H., Samson, J. A., Polcari, A., & McGreenery, C. E. (2006). Sticks, stone, and hurtful words: relative effects of various forms of childhood maltreatment. *American Journal of Psychiatry, 163*, 993-1000.

- Thomas, S. P. (1989). Gender differences in anger expression: Health implications. *Research in Nursing and Health, 12*, 389-398.
- Tomlinson, P. S. (1987). Spousal differences in marital satisfaction during the transition to parenthood. *Nursing Research, 36*, 239-243.
- Waters, W. F., Adams, S. G., Binks, P., & Varnado, P. (1993). Attention, stress and negative emotion in persistent sleep-onset and sleep-maintenance insomnia. *Sleep, 16*, 128-136.
- Weissman, M., Fox, K., & Klerman, G. L. (1973). Hostility and depression associated with suicide attempts. *American Journal of Psychiatry, 130*, 450-455.
- Wells, J. D., Hobfoll, S. E., & Lavin, J. (1999). When it rains, it pours: The greater impact of resource loss compared to gain on psychological distress. *Personality and Social Psychology Bulletin, 25*, 1172-1182.
- Wenze, S., Gunthert, K., Forand, N., & Laurenceau, J. (2009). The influence of dysphoria on reactivity to naturalistic fluctuations in anger. *Journal of Personality, 77*, 795-824.
- White, L. K., & Booth, A. (1985). The transition to parenthood and marital quality. *Journal of Family Issues, 6*, 435-449.
- Wing, J. K., Babor, T., Brugha, T., Burke, J., Cooper, J. E., Giel, R., . . . Sartorius, N. (1990). SCAN. Schedules for clinical-assessment in neuropsychiatry. *Archives of General Psychiatry, 47*, 589-593.
- Wilson, S. R., Rack, J. J., Shi, X., & Norris, A. M. (2008). Comparing physically abusive, neglectful, and non-maltreating parents during interactions with their children: A meta-analysis of observational studies. *Child Abuse and Neglect, 32*, 897-911.
- Yeh, K.-H., Tsao, W.-C., & Chen, W.-W. (2010). Parent-child conflict and psychological maladjustment: A mediational analysis with reciprocal filial belief and perceived threat. *International Journal of Psychology, 45*, 131-139.

Zoccolillo, M., Meyers, J., & Assiter, S. (1997). Conduct disorder, substance dependence, and adolescent motherhood. *American Journal of Orthopsychiatry*, 67, 152-157.