Psychological distress across pregnancy and postpartum: A prospective study

by

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BBSc; PGradDipPsych; MPsy (Clinical)

Submitted in fulfillment of the requirements for the degree of

Doctor of Philosophy

Deakin University

December, 2015
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*Psychological distress across pregnancy and postpartum: A prospective study*

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Perinatal Depression

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<tr>
<td>Prof Jeannette Milgrom</td>
<td>Reviewed the manuscript and provided valuable feedback prior to submission, particularly in regards to concisely presenting the results, and the focus of the discussion.</td>
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<td>Signature Redacted by Library</td>
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Authorship Statement for Study Four

AUTHORSHIP STATEMENT

1. Details of publication and executive author

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<th>Publication details</th>
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<tr>
<td>Examining the Role of Coping and Cognitive Appraisal as Unique Predictors of Perinatal Distress: Pre and Post Birth.</td>
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</tr>
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<tr>
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<th>School/Institute/Division if based at Deakin; Organisation and address if non-Deakin</th>
<th>Email or phone</th>
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<tbody>
<tr>
<td>Sofia Rallis</td>
<td>School of Psychology, Faculty of Health, Deakin University</td>
<td><a href="mailto:sra@deakin.edu.au">sra@deakin.edu.au</a> OR <a href="mailto:sofia.rallis@austin.org.au">sofia.rallis@austin.org.au</a></td>
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2. Inclusion of publication in a thesis

| Is it intended to include this publication in a higher degree by research (HDR) thesis? | Yes | If Yes, please complete Section 3 If No, go straight to Section 4. |

3. HDR thesis author’s declaration

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<th>School/Institute/Division if based at Deakin</th>
<th>Thesis title</th>
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<tr>
<td>As above</td>
<td>As above</td>
<td>Psychological distress across pregnancy and postpartum: A prospective study</td>
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</table>

If there are multiple authors, give a full description of HDR thesis author’s contribution to the publication (for example, how much did you contribute to the conception of the project, the design of methodology or experimental protocol, data collection, analysis, drafting the manuscript, revising it critically for important intellectual content, etc.)

The HDR candidate (Sofia Rallis) conceptualised the study, including the design of the methodology, following a review of the literature where certain gaps were identified. The candidate conducted the data collection and data entry, with the help of a research assistant. All data screening and analyses for the manuscript were conducted by the candidate. Multiple drafts of the manuscript were prepared, and final edits were made following the valuable feedback from the co-authors prior to submission.

I declare that the above is an accurate description of my contribution to this paper, and the contributions of other authors are as described below.

[Signature and date]

4. Description of all author contributions

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<th>Contribution(s) (for example, conception of the project, design of methodology or experimental protocol, data collection, analysis, drafting the manuscript, revising it critically for important intellectual content, etc.)</th>
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<tr>
<td>Prof Helen Skouteris</td>
<td>Provided assistance regarding the key variables which formed the focus of the paper and aspects of the methodology. Reviewed the manuscript and provided valuable feedback prior to final submission.</td>
</tr>
<tr>
<td>Prof Jeannette Milgrom</td>
<td>Reviewed the manuscript and provided valuable feedback prior to submission, particularly in regards to the introduction, and suitable journals considering the focus of the paper.</td>
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Abstract

The current thesis examined the changes and inter-relationships between symptoms of depression, anxiety and stress (distress symptoms) during the perinatal period; as well as the influence that coping strategies have on levels of distress. The specific role of cognitive appraisal and coping as unique predictors of maternal distress during pregnancy and the first year postpartum was also evaluated. **Study One** was a discussion paper which posed the question as to whether the term ‘perinatal distress’ is a useful term to capture the range of affective states experienced during the perinatal period, and whether it is limited to the experience of depression and anxiety alone. This paper reviewed the literature to identify studies that have focused on the experience of stress as a distinct affective state in the perinatal period. This review highlighted the inconsistent manner in which the concept of stress has previously been assessed. It was argued that future studies ought to investigate stress as a separate affective state during the perinatal period, in order to assess if and how it differs from depression and/or anxiety in an effort to attain a more comprehensive understanding of women’s experiences during their transition to motherhood. **Study Two** examined the trajectory of depression, anxiety and stress symptoms throughout pregnancy on a monthly basis, while also exploring the prospective relationships between these symptoms. Levels of depression, anxiety and stress were all shown to change over time, with women experiencing significantly fewer symptoms during the middle of their pregnancy. Earlier distress symptoms predicted higher symptom levels throughout the rest of pregnancy. Increased depression in early pregnancy appears particularly pertinent as it predicted later depression symptoms, as well as increased anxiety and stress later in pregnancy. **Study Three** investigated the type of coping strategies used by women across the perinatal period; and also explored the prospective and concurrent relationships between coping and depressive, anxiety
and stress symptoms. The most frequently used pregnancy-specific coping strategy was Planning-Preparation. Earlier coping strongly predicted later coping, both antenatally and postnatally. Various coping strategies predicted distress symptoms, with pregnancy-specific Avoidance being the most consistent predictor. Distress levels also influenced current coping, thus indicating a bi-directional relationship. **Study Four** explored the role of cognitive appraisal and coping strategies in the development of depression, anxiety and stress, after controlling for the effects of well established factors, both pre and post birth. Results from Study Four indicated that two cognitive appraisal and five specific coping strategies predicted distress at different time-points, with specific factors differing in their prediction of depression, anxiety and stress symptoms, at different times. Higher Threat and Uncontrollable appraisal were shown to be significant predictors for depression and anxiety respectively, but only in the postpartum. The influence of coping strategies were more widespread, with significant effects emerging during pregnancy and the postpartum, related to depression, anxiety and to a lesser extent stress. Antenatally, pregnancy specific Avoidance predicted both increased depression and anxiety; decreased use of Growth/Positive Reinterpretation also predicted depression; while decreased use of Emotional Support predicted anxiety. Use of Disengagement predicted higher anxiety and stress symptoms at 3 months postpartum, while decreased Planning predicted higher depressive symptoms. At 12 months postpartum, only decreased use of Growth/Positive Reinterpretation predicted depression.

Collectively these studies highlight the complex nature in which various factors influence perinatal depression, anxiety and stress, and the benefit of assessing key factors over an extended period of time. In turn, it appears that screening and treatment programs are likely to benefit from the inclusion of cognitive appraisal and coping strategies.
Chapter 1

Introduction and Literature Review

Pregnancy and motherhood is traditionally conceptualised as a period in a woman’s life that is typically associated with feelings of delight, anticipation and excitement. However, for a significant number of women, this period of time is associated with considerable distress (Buist et al., 2008; Howard, Piot & Stein, 2014; Miller, Pallant, & Negri, 2006; Terry, Mayocchi, & Hynes, 1996). The perinatal period, which includes pregnancy and the first year post birth, is now recognised as a period of transition that can be extremely emotionally challenging (Cristescu, Behrman, Jones, Chouliaras & Ebmaeier, 2015; Matthey, 2009). This period has also been identified as a time where women are at an increased risk of developing mood disturbances such as antenatal and/or postpartum depression and anxiety (Gale & Harlow, 2003; Milgrom et al., 2008; Seimyr, Edhborg, Lundh, & Sjögren, 2004). Both the personal and economic costs related to perinatal mental health are significant, thus highlighting the need for effective interventions and preventative programs (Haga, Drozd, Brendryen, & Slinning, 2013).

Given that depression is the leading cause of disease-related disability among women in their childbearing years (15-44 years of age) (Weissman & Olfson, 1995; Bennett, Einarson, Taddio, Koren, & Einarsen, 2004), and is often co-morbid with anxiety and significant stress, it is imperative that the patterns and mechanisms that underlie the development and maintenance of these mood disturbances are better understood. Substantial psychosocial changes are associated with the transition to motherhood, including a distinct redefinition of one’s roles, significant changes to one’s lifestyle, and an increase in overall demands (Grant, McMahon, & Austin, 2008; Kearns, Neuwelt, Hitchman, & Lennan, 1997). Thus factors pertaining to how mothers cope and adapt to their changing circumstances are of particular interest and cognitive appraisal and coping strategies may play a key role in the development and/or maintenance of
maternal mood symptoms. Interestingly, despite the considerable amount of research attention that has focused on postpartum depression, and co-morbid anxiety disorders (Hammen & Brennan, 2003; Rubertsson, Wickberg, Gustavsson, & Radestad, 2005), there are few longitudinal studies that assess symptoms of depressions, anxiety, as well as stress and the potentially unique role that cognitive appraisal and coping strategies may have across the entire perinatal period.

In the review of the literature that follows, the methods and findings of past studies are summarized as well as the methodological limitations. A proposed conceptual model of maternal distress across pregnancy and the first postpartum year, incorporating Lazarus and Folkman’s (1984) Transactional Theory of Stress and Coping and the biopsychosocial model for perinatal depression (Milgrom, Martin & Negri, 1999) is then presented, along with the rationale for the variables included in this model. In the final section, the aims, and hypotheses of this PhD research project are outlined.

Maternal Depression

Postnatal depression is by far the most researched mood disorder in the perinatal context (Milgrom et al., 2008; O’Hara, Stuart, Gorman, & Wenzel, 2000). In more recent years, antenatal depression has also been of particular interest given that it has repeatedly been identified as a strong predictor of postnatal depression and may even be more prevalent than depression post birth (Clark, Skouteris, Wertheim, Paxton, & Milgrom, 2009; Evans, Heron, Fracomb, Oke, & Golding, 2001). Antenatal and postnatal depression affect approximately 10-25% of women, however, it is estimated that only half of all cases are detected (Britton, 2005; Faisal-Curry & Menzes, 2007; Qiao, Wang, & Wang, 2012; Sutter-Dallay, Giaccone-Marcosche, Glatigny-Dallay, & Verdoux, 2004), with a large proportion going by untreated (Haga, et al., 2013). Given the increased demands new parents are faced with, it is not surprising that it has
been argued that all parents will experience some degree of emotional reactivity (Mulsow, Caldera, Pursley, Reifman, & Houston, 2002). Thus, while some symptoms of depression reflect normal changes and stressors associated with the perinatal period, others may be sufficiently severe to be classified as antenatal or postnatal depressive disorders which extend beyond the scope of mild symptomatology (Beck, 1993). It is important to note that current evidence indicates that both clinical and sub-clinical depressive symptoms require further investigation; as maternal depressive symptoms have been associated with a range of difficulties, for both the mother and her infant, even when the symptoms are within the mild or moderate range (Edhborg, Nasreen & Kabir, 2011; Tietz, Zietlow, & Reck, 2014; West & Newman 2003).

Maternal depression affects not only the mother herself, but also her partner, fetus and infant development, as well as various social and interpersonal relationships (Bonari et al., 2004; Cooper & Murray, 1995; Diego, et al., 2004; Edhborg, Lundh, Seimyr, & Wildstrom, 2001; Gale & Harlow, 2003; Kingston, McDonald, Austin & Tough, 2015; O’Hara, Wisner, & Asher, 2014; Stein et al., 2014; Wee, Skouteris, Pier, Richardson, & Milgrom, 2011). Elevated depressive symptoms have been shown to be associated with inadequate prenatal care (Bonari et al., 2004; Field, Diego, & Hernadez-Reif, 2010), excessive gestational weight gain (Hartley, McPhie, Skouteris, Fuller -Tyszkiewicz, & Hill, 2015; Hurley, Caulfied, Sacco, Costigan, & DiPietro, 2005; Barbara, Siega-Riz, Dole, & London, 2009), greater fetal activity (Dieter et al., 2001; DiPietro, Hilton, Hawkins, Costigan, & Pressman, 2002), insecure mother-infant attachment style (De Falco, Emer, Martini, Rigo, Pruner & Venuti, 2014; Manassiss, Bradley, Goldberg, Hood, & Swinson, 1994; Murray, Cooper, Wilson, & Romaniuk, 2003; Toth, Cicchetti, Rogosch, & Sturge-Apple, 2009), increased parenting stress and difficulties (Murray, Cooper, & Fearon, 2014; Nicol-Harper, Harvey & Stein, 2007; Leigh & Milgrom, 2008; Saisto, Salmela, Nurmi, & Halmesm, 2008; Righetti-Veltema, Conne-Perreard, Bousquet, & Manzano, 2002) body dissatisfaction and poor
sleep quality during pregnancy and the postpartum (Clark et al., 2009; Dorheim, Bjorvatn, & Eberhard-Gran, 2012; Field et al., 2007; Kamysheva, Skouteris, Wertheim, Paxton, & Milgrom, 2008; Rallis, Skouteris, Wertheim, & Paxton, 2007; Skouteris, 2012; Sweeney & Fingerhut, 2013), and higher rates of marital breakdown (Kerstis, Berglund, Engström, Edlund, Sylvén, & Aarts, 2014; Milgrom et al., 1999).

A distinct feature of perinatal depression is the additional impact on the infant’s wellbeing (Milgrom & Gemmill, 2014), with numerous studies assessing the development in children of depressed mothers giving reason for concern. Persistent depression across pregnancy and depression post-birth have been associated with developmental delays, including an increased risk of cognitive and behavioural difficulties, with difficulties emerging as young as 3 months (Deave, Heron, Evans, & Emond, 2008; Milgrom, Westley & Gemmill, 2004; Murray & Cooper, 1997; Koutra et al., 2013). Depressed mothers have been shown to be less affectionate, less responsive, and more withdrawn and hostile (Arteche et al., 2011; Reck et al., 2004). Depressed and anxious mothers can be unresponsive to their infant’s cues, with reduced emotional tone during interactions, and in some cases can also be intrusive and/or aggressive (Cohn, Campbell, Matias, & Hopkins, 1990; Gupta & Ford-Jones, 2014; Nicol-Harper et al., 2007). Mothers experiencing depression can also perceive themselves as less emotionally attached to their child, more socially isolated and less competent (Logsdon, Wisner, & Pinto-Foltz, 2006; Milgrom & McCloud, 1996); while the infants themselves have also been shown to adopt a ‘depressed’ style of interaction and display increased negative affectivity (Field et al., 1988; Righetti-Veltema, Conne-Perreard, Bousquet, & Manzano, 2002; Rouse & Goodman, 2014). The presence of more functional disorders such as feeding and sleeping difficulties (Hiscock et al., 2014; Righetti-Veltema et al., 2002) and externalizing disorders (Barker, Copeland, Maughan, Jaffee, & Uher, 2012) has also been reported. These concerning patterns of behaviour and difficulties can often
continue beyond the first year post birth, even after levels of depression have dissipated (Letourneau, Tramonte, & Willms, 2013; Migrom & McCloud, 1996; Reck et al., 2004).

Considering a child’s healthy development and overall wellbeing originates from the early maternal-infant interactions and secure attachment (Bowlby, 1969), promoting the emotional and physical health of children, ensuring their security, and maximising their opportunities to provide a basis for a healthy start to life (Hoghughi, 1998) is of undeniable importance. Maternal depressive symptoms between 2 and 16 weeks postpartum have been strongly associated with lower quality of maternal bonding to the infant from 2 weeks until 14 months postpartum, even when the depressive symptoms were mild or moderate (Edhborg et al., 2011; Moehler, Brunner, Wiebel, Reck, & Resch, 2006; Tietz et al., 2014). Sub-clinical depressive symptoms during the postpartum have also been related to behavioural and emotional problems in children (West & Newman, 2003; Ramchandani, Stein, Evans & O’Connor, 2005).

Furber, Garrod, Maloney, Lovell, and McGowan (2009) conducted a qualitative study with pregnant women who reported experiencing mild to moderate psychological distress to their midwife during an antenatal visit. Findings indicated that even this mild to moderate presentation had a significant impact on the women’s functioning, such as withdrawing from everyday activities. Results such as these indicate that even when symptoms of depression are not within clinical range, the negative impact can still be substantial. In turn, this highlights the need for research studies to focus not just on clinical samples, where individuals meet diagnostic criteria, but also on better understanding the patterns and contributing factors for sub-clinical symptomatology. This will allow effective interventions to be designed and applied to prevent the long-term impact of perinatal depression and anxiety; as maternal mood difficulties can predict psychosocial impairment and affective disorders well into childhood and adolescence, thus implicating familial, health and educational costs for many years and potentially

A number of reviews and studies have also indicated that there appears to be an increased likelihood of depression in fathers, when maternal depression is present, thus suggesting a relationship between maternal and paternal depression (Goodman 2004; Paulson, & Bazemore, 2010; Wee et al., 2011). Having a depressed partner appears to be risk factor for depression in men both antenatally and postnatally. Furthermore, a cumulative effect may also exist, where an increase in depression in one partner possibly leads to an increase in depression in the other (Deater-Deckard, Pickering, Dunn, & Golding, 1998; Matthey, Barnett, Howie & Kavanagh, 2003; Matthey, Barnett, Ungerer, & Waters, 2000). Paternal depression on its own can negatively impact on infant and child development, including an increased risk of behavioural and emotional problems in children at 3 years (Ramchandani et al., 2005) and 4-5 years years of age (Fletcher, Freeman, Garfield & Vimpani, 2011). It can also exacerbate the effects of maternal depression, as that there is evidence that children who have two depressed parents are at an increased risk of social, emotional and cognitive deficits (Burke, 2003; Carro, Grant, Gotlieb & Compass, 1993; Paulson, Dauber, & Leiferman, 2006)

Given that the potentially detrimental effects of antenatal and postnatal depression extend to the mother, her infant, as well as family and social relationships, it is imperative that health professionals detect antenatal and postpartum depression as early as possible in an attempt to prevent the ongoing negative consequences. If left untreated, antenatal and postnatal depression can persist into the first, second, and subsequent years following the infant’s birth (Evans et al., 2001; Gale & Harlow, 2003; Milgrom et al., 2004; O’Hara & Swain, 1996; Suri & Altshuler, 2004; Talge, Neal, & Glover, 2007), thus highlighting the long term negative effects which can extend well beyond the perinatal period.
Maternal Anxiety

For many years, maternal depression was the sole point of focus when assessing a mother’s mood state during the transition to motherhood. More recently, a notable shift has occurred, whereby antenatal and postnatal anxiety has also been of considerable interest. Anxiety in the perinatal period affects approximately 25-45% of women and may therefore be more common than depression (Britton, 2005; 2008; Faisal-Curry & Menzes, 2007; Goodman, Chenausky, & Freeman, 2014; Sutter-Dallay et al., 2004).

Furthermore, whilst depressive symptoms and anxiety are often identified as risk factors of, and pre-cursors to, postpartum depression (Austin, Tully, & Parker, 2006; Heron, O’Connor, Evans, Golding, & Glover, 2004; Johnstone, Boyce, Hickey, Morris-Yates, & Harris, 2001), to the author’s knowledge the bi-directional relationships between symptoms of anxiety and depression through pregnancy and the postpartum have only been evaluated in two studies (Moss, Skouteris, Wertheim, Paxton, & Milgrom, 2009; Skouteris, Wertheim, Rallis, Paxton, & Milgrom, 2009). The findings of these studies revealed that a cycle of co-morbidity may exist, whereby initial levels of depressive symptoms in pregnancy lead to higher levels of anxiety in late pregnancy, which in turn predict higher depressive symptoms in the postpartum.

The effects of maternal anxiety can be just as debilitating as those of depression, with severe anxiety affecting both the mother and her infant (Barker, Jaffee, Uher, & Maughan, 2011; Glover, 2014; Kingston & Tough, 2014; Kinsella & Monk, 2009; Manassis et al., 1994; O’Connor, Heron, Golding, Beveridge, & Glover, 2002). Elevated anxiety symptoms have been associated with greater fetal activity (DiPietro et al., 2002; Dunkel-Schetter & Tanner, 2012), insecure mother-infant attachment style (Pisoni et al., 2014; Manassis et al., 1994; Murray et al., 2003), more intrusive, critical and less warm behaviour (Goodman et al., 2014; Kaitz, Maytal, Devor, Bergman, & Mankuta, 2010; Whaley, Pinto & Sigman, 1999), adverse obstetric outcomes such as
a shorter gestational period (Kramer et al., 2009; Dunkel-Schetter & Tanner, 2012), and
increased parenting stress and dysfunctional interactions (Nicol-Harper et al., 2007; Leigh &
Milgrom, 2008; Misri et al., 2010; Saisto et al., 2008; Righetti-Veltema et al., 2002; Wernand,
Kunseler, Oosterman, Beekman, & Schuengel, 2014).

High levels of antenatal anxiety have also been associated with an increased risk for
conduct problems, symptoms of hyperactivity, and emotional disturbances in preschool aged
children (Leis, Heron, Stuart & Mendelson, 2014; O'Connor et al., 2002); and symptoms of
hyperactivity, internalizing and externalizing problems, and anxiety in children aged 8 to 11
years (Park et al., 2014; Van den Bergh & Marcoen, 2004). These effects remained even after
controlling for potentially confounding variables such as gender and parent educational level.
Maternal anxiety post-birth and during the second and third trimester of pregnancy has also
been associated with difficult infant temperament and attention regulation (Austin, Hadzi-
Pavlovic, Leader, Saint, & Parker, 2005; Britton, 2011); motor and cognitive delays (Ali, Mahmud,
Khan, & Ali, 2013; Huizink, Robles de Medina, Mulder, Visser, & Buitelaar, 2003), as well as
cognitive and attentional processes across infancy (Brouwers, van Baar, & Pop, 2001; Keim,
Daniels, Dole, Herring, Siega-Riz, & Scheidt, 2011).

The presence of depression and anxiety can further impact on the dyadic relationship
and may impair parenting, which can in turn further increase the risk of developmental,
behavioural and emotional disturbances in children (Avant, 1981; Carter, Garrity-Rokous,
Chazan-Cohen, Little, & Briggs-Gowan, 2001; Glover, 1991; Luoma et al., 2001; O'Connor et al.,
2002). Co-morbid depression and anxiety during the antenatal period has also been associated
with poorer neonatal outcomes, such as a greater incidence of prematurity (Field et al., 2010). In
one of the most recent studies Tietz, Zietlow and Reck (2014) examined the association between
postpartum anxiety disorders, depressive symptoms and maternal bonding. The Structured
Clinical Interview for DSM-IV Disorders was used with mothers when their infants were approximately 4 months old. Specific aspects of anxious symptomatology were also assessed. Results indicated that women with a postpartum anxiety disorder reported significantly lower bonding in comparison to non-anxious mothers. Furthermore, concurrent sub-clinical depressive symptoms and avoidance of anxiety-related situations explained 27% of the overall variance in maternal bonding. Tietz et al. suggested that the perceived lower bonding of mothers experiencing an anxiety disorder may be at least partly due to the concurrent sub-clinical depressive symptoms. They argued that there is a need to consider the impact of even mild depressive symptoms in the context of postpartum anxiety, and address them in treatment plans. Given the rapid infant development that occurs during the perinatal period, and the impact that a compromised mother infant relationship can have on an infant’s development and emotional wellbeing (Nicol-Harper et al., 2007), any psychological disturbances occurring in the perinatal period are also of particular concern. In turn, there appears to be a clear need to better understand the mechanisms that underlie the development of maternal depression and anxiety both at the clinical and sub-clinical level.

Maternal Stress/Distress

A review of the literature reveals that terms such as ‘stress’, ‘distress’ and ‘anxiety’ have often been used inter-changeably and with varying definitions. The terms ‘depression’ or ‘depressive symptoms’ are generally clear and used to refer to low/dysphoric mood and associated features. However, the term ‘anxiety’ has been used to refer to a range of presentations such as anxious affect, the occurrence of life events, and the presence of worrying thoughts about specific situations (i.e., about the birth process). The terms ‘stress’ and ‘distress’ have also been used inconsistently, as they have been used to describe a range of experiences, including the presence of mood disturbances (Kearns et al., 1997), state anxiety (Da Costa,
This inconsistent use of terminology was also noted by Emmanuel and St John (2010), who argued that the concept of maternal distress and the range of experiences that occur during the perinatal period need to be better understood. Emmanuel and St John asserted that maternal distress consists of a cluster of key attributes. Specifically, maternal distress was conceptualized as a woman’s given response to the transition to motherhood which involves changes to one’s body, role, relationships and social circumstances; the birth experience itself, as well as the demands, losses and gains associated with being a new parent. Maternal distress was proposed to occur on a continuum across four domains: stress responses, adaptation responses, function and control responses, and connecting responses. While this concept analysis offers a useful framework in light of the fact that it includes the woman’s psychosocial context as well as the consequences that may be associated with high maternal distress (e.g., mental health disturbances), it does not address the question of how to best assess and treat key distress symptoms.

According to Lovibond and Lovibond (1995a), the term ‘stress’ refers to a distinct negative emotional state that involves chronic arousal and impaired function, and thus should be differentiated from the experience of depressed or anxious mood and affect and other clinical presentations such as post-traumatic stress disorder (PTSD) and acute stress disorder. For example, in the case of PTSD the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013) states that five key criteria need to be met, namely: (1) experiencing or witnessing a traumatic event, (2) persistent re-experiencing of the
event (e.g., via nightmares or flashbacks, (3) avoidance of stimuli that are associated with the trauma and numbing of general responsiveness (e.g., avoiding people, places, or conversations that may trigger recollections of the traumatic event), (4) negative alterations in cognitions and mood associated with the traumatic event (e.g., feeling detached or estranged from others), and (5) a marked alteration in arousal and reactivity (e.g., experiencing hypervigilance and/or an exaggerated startle response). For a clinical diagnosis of PTSD to be met the duration of the symptoms must be greater than one month. This key criterion about timing is also what essentially differentiates PTSD from a diagnosis of acute stress disorder (ASD), where the symptoms are present for less than a month. Thus, the category of ASD was introduced to describe the acute stress reaction that occurs in the first few weeks after exposure to a traumatic event, and before the possibility of diagnosing posttraumatic stress disorder. In the most recent DSM-V edition, it is interesting to note that PTSD is no longer considered to be an Anxiety Disorder, but rather is now under the category of ‘Trauma and Stressor-Related Disorders’ thus again highlighting the importance of clearly defining and acknowledging the unique features of between different presentations and diagnoses (American Psychiatric Association, 2013).

Lovibond and Lovibond (1995a) definition of stress, as a separate affective state, differs from other definitions where stress has often been conceptualised as the presence of particular events or circumstances (Dunkel-Schetter & Tanner, 2012), and thus warrants further examination given that not only is it explicitly defined, but can also be specifically measured. This definition of stress was used in the current PhD studies, while the broader term of ‘distress’ was conceptualised as the presence of depression and/or anxiety and/or stress symptoms, that is, at least one of the three affective states (Miller et al., 2006; Rallis, Negri & Smith, paper submitted).
To the author’s knowledge the affective state of ‘stress’ as defined above, has only been investigated in two recent studies (Miller et al., 2006; Rallis et al. paper submitted), in which the trajectory of stress symptoms during the postpartum was explored as part of a broader definition of ‘distress’. The point prevalence of stress, with a validated measure that differentiates stress from anxiety and depression during pregnancy, has not been investigated. The antecedents and consequences of maternal stress during the perinatal period also remain unclear, largely due to the lack of consistent terminology used in past research studies who have explored the risk factors for high maternal stress (Dunkel-Schetter & Tanner, 2012; Grazioli & Terry, 2000; Nicol-Harper et al., 2007; Ostberg, Hagekull, & Wettergren, 1997; Silveira, Pekow, Dole, Markenson, & Chasan-Taber, 2013; Singer et al., 2010; Smith, Oliver, & Innocenti, 2001; Steinberg, & Bellavance, 1999),

Past Research on the Prevalence of Antenatal and Postnatal Depression and Anxiety

Despite the considerable research attention on antenatal and postnatal depression, relatively few studies have explored maternal depression prospectively across both pregnancy and the postpartum period. Most prospective studies conducted to date have assessed depression at only two (e.g., Grant et al., 2008; Stuart, Couser, Schilder, O’Hara & Gorman, 1998), or three time-points (e.g., Benevicius, Kusminska, Benevivius, Nadisauskiene, Jureniene, & Pop; 2009; Da Costa et al., 2000; Dennis, 2004; Misri et al., 2010; Seimyr et al., 2004) across the perinatal period. To the author’s knowledge, the most comprehensive data available to date are from studies assessing maternal ante- and postnatal depression across four time-points (Evans et al., 2001; Matthey et al., 2000; Moss et al., 2009; Verkerk, Pop, Van-Son, & Van Heck, 2003), and two studies that have assessed depressive symptoms across five time-points (Clark et al., 2009; Perren et al., 2005).
Matthey et al. (2000) examined the course of depression in first-time mothers, while also exploring the role of personality and parental relationships as risk factors, at 20-24 weeks gestation and at 6, 12, and 52 weeks post-birth. Maternal depressive symptoms were assessed using the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) and the General Health Questionnaire (GHQ; Goldberg, 1978). The prevalence of maternal depression was 12.3% at 20-24 weeks gestation, and 7.7%, 9.7%, and 12.4% at 6, 12, and 52 weeks post-birth, respectively, indicating that rates of depression were at their highest antenatally and at 12 months postpartum. Levels of neuroticism, parental control, high interpersonal sensitivity and prior depression were all associated with depression scores; however, the patterns differed across the various time points. Matthey et al. argued that adjustment to parenthood is likely to be related to different variables at different times, thus highlighting the need for prospective studies which assess not only the course of mood during the perinatal period, but also the risk and protective factors at different intervals.

Verkerk et al. (2003) investigated the antenatal prediction of the occurrence of depression during the first year postpartum. During mid-pregnancy, women were screened for risk factors of depression and classified as either ‘high-risk’ or ‘low-risk’. Depression was assessed via the EPDS which was administered at 32 weeks gestation and at 3, 6, and 12 months postpartum. For women in the ‘high-risk’ group, the point prevalence of high depression scores was 22% during pregnancy, 17% at 3 months postpartum, 11% at 6 months postpartum, and 8% at 12 months postpartum. In contrast, the point prevalence of high depression scores for women in the ‘low-risk’ group was 2% during pregnancy, 1% at 3 months postpartum, 5% at 6 months postpartum, and 2% at 12 months postpartum. The two risk factors independently predictive of depression during the postpartum were a personal history of depression and high depressive
symptomatology during pregnancy. In turn, it was argued that the assessment and treatment of maternal depression needs to begin early in pregnancy.

As part of the Avon Longitudinal Study of parents and children Evans et al. (2001) tracked mothers’ mood through pregnancy and after childbirth in a sample of 13,799 women. The EPDS was completed at 18 and 32 weeks gestation and at 8 weeks and 8 months postpartum. Results indicated that depression scores were higher at 32 weeks gestation than at 8 weeks postpartum. The percentage of women with probable depression (EPDS score of \( \geq 13 \)) was 11.8% at 12 weeks gestation, 13.5% at 32 weeks gestation, 9.1% at 8 weeks postpartum, and 8.1% at 8 months postpartum. In addition, 1.6% of the women had probable depression at all four time-points.

Perren et al. (2005) investigated the effects of parental psychopathology on the course of depressive symptoms in a sample of 74 first-time mothers. The EPDS was completed during pregnancy and at 1, 3, 12, and 18 months postpartum. Psychopathology was established during pregnancy, using a revised version of the Symptom Checklist of Derogatis (SCL-90-R; Derogatis, 1977) as well as self-reports. For women without psychopathology, higher depressive symptoms were reported during pregnancy and the early postpartum, in comparison to 12 and 18 months postpartum. For women with psychopathology the pattern was more complex, as depressive symptoms decreased from pregnancy to 3 months postpartum and then tended to increase again after this time point.

In a study by Clark et al. (2009) a total of 116 women completed the short form of the BDI (BDI-SF; Beck & Beck, 1972) at 17-21 weeks and at 32-35 weeks gestation, and at 6 weeks, 6 months and 12 months postpartum. Women reported significantly higher depressive symptoms at 32-35 weeks gestation in comparison to all other time points. These results concur with those obtained in the Evans et al. (2001) study, suggesting that symptoms of depression may be more common during pregnancy and that research and clinical efforts need to move towards
establishing better understanding, recognition, and treatment of depression during the antenatal period.

Findings from studies exploring the co-morbidity of maternal depression and anxiety have also indicated that postpartum depressed women may be up to 59 times more likely to present with marked or severe anxiety, in comparison to non-postpartum women (Hendrick, Altshuler, Strouse, & Grosser, 2000; Miller et al., 2006; Righetti-Veltema et al., 1998). Hence, women experiencing depression following the birth of a baby may be far more susceptible to anxiety disturbances in comparison to women suffering from depression at other stages in their lives.

Coates, Schaefer, and Alexander (2004) found that almost 20% of postpartum women had been prescribed anxiolytic medications, indicating a high incidence of anxiety symptoms. Furthermore, almost 15% of these women did not have elevated depression scores and over 75% of these ‘anxious’ women were ‘new’ cases, that is, with an onset in the first 12 months postpartum with no prior history of anxiety. These results accord with Johnson, Weissman, and Klerman’s (1992) study, the findings of which revealed that 30% of women who had recently given birth were emotionally distressed irrespective of depression levels. Given that an association between anxious features and poorer prognosis has been found, anxiety in the context of depression may be a particularly significant clinical concern, where specialised treatment planning is required (Hendrick et al., 2000). This argument is further supported by findings that up to 50% of clinically depressed pregnant and postpartum women demonstrated clinically significant and comorbid anxiety, even after controlling for factors such as age and desired pregnancy (Najman, Morrison, & Williams, 1991; Ross, Gilbert-Evans, Sellers, & Romach, 2003).

Given the high co-morbidity rates of maternal depression and anxiety and the effects of these affective states, it is again surprising that only a few studies have explored maternal
anxiety prospectively across both pregnancy and the postpartum period. To the author’s knowledge, only one prospective study to date has focused solely on anxiety (Britton, 2008). Britton (2008) examined the early course and antecedents of postpartum anxiety during two time-points: immediately postpartum (just before hospital discharge) and at 1-month postpartum. State anxiety scores were shown to be significantly higher at 1 month postpartum in comparison to immediately post-birth; with 24.3% and 31.7% of mothers experiencing moderate to severe anxiety immediately post-birth and at 1-month postpartum respectively. Anxiety at 1-month postpartum was also found to be correlated with a personal psychiatric history, medical and negative life events and perceived peripartum stress.

Most longitudinal studies assessing anxiety across time have also investigated depression, however once again the study time-points have often been limited to only two (Grant et al., 2008; Stuart et al., 1998; Sutter-Dallay et al., 2004) or three time-points (Skouteris, Wertheim, et al., 2009). The most comprehensive trajectory available to date is from three studies which have assessed maternal anxiety and depression across four time-points (Heron et al., 2004; Lee et al., 2007; Moss et al., 2009).

Heron et al. (2004) assessed self-reported anxiety using the anxiety items from the Crown-Crisp Experiential Index (CCEI; Crisp, Jones, & Slater, 1978) and depression using the EPDS at 18 and 32 weeks gestation and at 8 weeks and 8 months postpartum. Results indicated that the majority of cases of postnatal depression and anxiety were preceded by antenatal depression and anxiety respectively. Antenatal anxiety was also found to be a significant predictor of postnatal depression at both 8 weeks and 8 months postpartum, even after controlling for antenatal depression.

Similarly, Lee et al. (2007) examined the prevalence of and inter-relationship between anxiety and depression across pregnancy and the early postpartum. Three-hundred and fifty-
seven pregnant women were assessed longitudinally at four time-points during their first, second and third trimester of pregnancy and at 6 weeks postpartum. The means weeks of gestation at which antenatal assessments were conducted were 12.5 (SD=1.2), 19.5 (SD=1.8), and 34.4 (SD=1.7). Antenatal anxiety and depression were assessed using the Hospital Anxiety and Depressions Scale (HADS; Zigmond & Snaith, 1983). Postpartum depression was assessed using the EPDS. Anxiety and depressive symptoms were reported by 54% and 37% of women, respectively, in at least one antenatal assessment. Anxiety was more prevalent than depression at all stages. The course of both anxiety and depression symptoms varied across time, with both affective states being most prevalent during the first and third trimesters. Furthermore, both antenatal anxiety and depression were shown to increase the risk of postpartum depression. Lee et al. argued that the changing course of antenatal anxiety and depression requires continuous assessment over the course of pregnancy, especially as both can predict postpartum depression.

In one of the more recent studies, Moss et al. (2009), examined anxiety and depression at 34 weeks gestation, and at 7 weeks, 6 months, and 12 months postpartum. The Trait Subscale of the State-Trait Anxiety Inventory (STAIT-T; Spielberger, Gorsuch, & Lushene, 1970) and the short form BDI were used to assess self-reported anxiety and depression, respectively, at each time-point. Moss et al. found that depressive symptoms were higher in late pregnancy and the early postpartum than at 6 and 12 months post birth. In contrast, anxiety scores peaked at 12 months post-birth.

The findings of Lee et al. (2007) and Moss et al. (2009) concur with those reported much earlier by Stuart et al. (1998) who assessed the point prevalence of anxiety and depression at 14 weeks and 30 weeks post-birth and found that not only did postpartum depression and anxiety frequently coexist, but that new cases of anxiety and depression developed as late as 7 months postpartum. Hence, it was argued there is a need to screen for anxiety when there is a known
case of depression and vice versa, while also needing to monitor the emergence of symptoms for longer time-periods (i.e., beyond the initial 3 months postpartum).

It has also been argued that there is a need to continually screen and assess the effects of depression and anxiety across the entire perinatal period as the timing and magnitude of exposure to maternal distress may produce different effects. For instance, several studies have shown that impaired child development is associated with the presence of maternal anxiety during the first trimester of pregnancy but not later trimesters (Brouwers et al., 2001; Van den Bergh & Marcoen, 2004). LaPlante, Barr, Brunet, Galbaud, Meaney, and Saucier (2004) reported lower intellectual and linguistic functioning when anxiety was present during the first and second trimesters but not the third. In contrast, there is evidence that women experiencing high levels of depression during their third trimester are more likely to have infants requiring admittance to neonatal care units (Chung, Lau, Yip, Chiu, & Lee, 2001), and that increased levels of maternal anxiety and depression during the second and third trimesters are predictive of poorer neonatal adaptation and poor health (Misri et al., 2004). More research is needed to enhance our understanding about the different effects that timing can have on maternal distress and the associated consequences.

In summary, the current evidence suggests that depression and anxiety symptoms are prevalent across the entire perinatal period. Inconsistencies in the patterns and rates of incidence reported appear to be at least partly due to the fact that different screening and assessment measures have been used, and often at different time-points. A further methodological limitation exists in that most studies to date have assessed these experiences at distant time-points with the closest time point being an average of 7 weeks in pregnancy (Lee et al., 2007), and 4 weeks in the postpartum for only one month (Britton, 2008). Research designs with distant and limited time-points make it difficult to assess: (1) what symptoms of pre- and
postpartum distress demonstrate the earliest onset; (2) what specific time points are associated
with escalated symptoms, and (3) what other factors during the course of pregnancy and the
postpartum impact on maternal mood. Interventions to treat and ideally prevent pre- and
postnatal distress and the associated effects will be most effective when a more rigorous and
systematic approach in this research area is adopted. Despite these limitations, the findings to
date generally indicate that depression and anxiety symptoms may peak later in pregnancy, and
that antenatal depression and anxiety are the strongest predictors of postnatal depression and
anxiety, thus highlighting the need for both research and clinical attention to focus on the
antenatal period.

*Antenatal/Postnatal Distress versus Antenatal/Postnatal Depression*

Miller et al. (2006) proposed a broader classification for ‘postnatal distress’, over and
above that of depression alone. Levels of anxiety, stress and depression in first-time mothers
were assessed by the EPDS and the 21-item Depression Anxiety Stress Scale (DASS-21; Lovibond
& Lovibond, 1995b). The EPDS identified 80 women (25%) as likely depressed, of which 58% were
corroborated by the DASS-21. The DASS-21 classified 61 women in total (19%) as depressed.
Implementing broader criteria for distress, the DASS-21 classified a further 33 women (10%) as
anxious and stressed without depression, clearly highlighting the fact that if the EPDS was used
as the sole measure in this study, these 33 women would not have been detected. Furthermore,
a total of 41 women (13%) were classified as anxious either independently or in combination
with depression, with 23 women (7% of the total sample) identified as both anxious and
depressed (anxious-depressed).

Miller et al. (2006) demonstrated that by applying a broader conceptualisation of
postnatal distress, 94 women (24% of the total sample) were found to have at least one
classification of depression, anxiety or stress, in the mild, moderate, severe or extremely severe
categories on the DASS-21. Their findings support those reported by Matthey, Barnett, Howie, & Kavvanagh, (2003), where anxious mothers without depression were also identified.

Extending the findings of Miller et al.’s (2006) study, Rallis, Negri and Smith (paper submitted) sought to attain a comprehensive trajectory of postpartum distress, by assessing levels of depression, anxiety, and stress across the first 12 months postpartum. In addition, the broader classification and identification of ‘distressed’ women was also explored by identifying women as anxious and stressed both in conjunction and in the absence of depression. Sixty women completed the EPDS and the DASS-21 on a monthly basis, commencing at 6 weeks postpartum and ceasing at 52 weeks postpartum. Significant differences across time were demonstrated for depression, anxiety and stress levels, with results indicating that distress levels peaked at 6-8 weeks, 22-28 weeks and 42-44 weeks postpartum. Cases of re-occurring distress were also revealed; as women often reported experiencing elevated distress symptoms, followed by a period of diminution, followed by a subsequent re-occurrence of distress symptoms.

When investigating a broader classification of ‘distress’, women were found to be anxious and stressed both in conjunction with and independent of depression, thus indicating that a broader classification of distress appears to be warranted, rather than depression alone. It was argued that there is a need to monitor and assess women’s overall distress levels across the entire first postpartum year and not just the initial few months post birth. Furthermore, given that distress symptoms appear to be present throughout the entire first postpartum year, it is feasible that a similar pattern also exists for distress symptoms across pregnancy. Prospective studies that assess maternal distress across pregnancy and the first postpartum year are needed in order to attain a better understanding of the prevalence and changing course of depression, anxiety and stress symptoms across the entire perinatal period.
Past Research on Appraisal and Coping during Pregnancy and the Postpartum Period.

The context of pregnancy and the early postpartum offers a unique opportunity to examine the associations between coping and emotional distress (Yali & Lobel, 2002). Pregnancy in particular, is a uniquely finite event, usually lasting between 36-40 weeks, with a clear objective and well-defined endpoint, thus differentiating it from many other stressful life events. The transition to motherhood is a major life event experienced by a significant number of women, many of who consider it to be stressful (Dunkel-Schetter, Gurung, Lobel, & Wadhwa, 2001), given that it requires a significant amount of adjustment in response to the many changes that occur within a relatively short period of time (Hamilton & Lobel, 2008; Rahe, 1990).

During the perinatal period, women are required to cope not only with the medical events of labor and the delivery experience, but must also adjust to considerable physiological and psychosocial changes, including a distinct redefinition of one’s roles, changes to one’s lifestyle and relationships, and an increase in overall demands (Grant et al., 2008; Kearns et al., 1997; Leight, Fitelson, Weston, & Wisner, 2010). The birth of a new child is a major interpersonal transitional period which brings with it many new challenges, as it demands an entirely new set of skills, including uncertainty in interpreting the needs of the infant, and also brings with it a new spectrum of responsibilities (Di Pietro, Goldshore, Kivlighan, Pater, & Costigan, 2015; Saisto et al., 2008). Parenting concerns, financial strains and medical complications are also frequently experienced, and are all potential sources of distress (Yali & Lobel, 1999). Nicolson (1999) described the transition to motherhood as the ‘ultimate paradox’ given that even when women are happy to be mothers, they are also dealing with the loss of their autonomy, as well as changes to their appearance, sexuality and occupational identity at the same time.

Given these changes, and the range of negative outcomes that often result if a successful transition is not made, factors pertaining to how new mothers cope and adapt to their changing
circumstances are of particular interest, as cognitive appraisal and coping strategies may play a key role in the development, maintenance and/or re-occurrence of maternal distress. Previous studies have also demonstrated that it may be possible to target and enhance coping with psychological treatment programs, with past research indicating that coping skills can increase following treatments such as Cognitive-Behavioural Therapy (CBT) and Interpersonal Therapy (Litt, Kadden, Cooney, & Kabela, 2003; Mosalanejad, Koolaee, & Jamali, 2012). Given that results tend to be vary depending on the specific sample (e.g., perinatal women as opposed to individuals with health issues or substance use disorders), a better understanding of the types of appraisal and coping strategies employed by women, how these coping strategies contribute to the experience of maternal distress, and ultimately how they may be targeted in interventions is clearly warranted.

A review of the research to date assessing coping and emotional distress during the perinatal period reveals three key limitations. These relate to the fact that limited and different time-points have been investigated; that research has often focused on specific sub-groups (e.g., women with medical conditions); and lastly, that various measures have been used, with an often notable absence of pregnancy specific measures; all important issues that were also highlighted in two recent reviews (Guardino & Dunkel-Schetter, 2013; Razurel, Kaiser, Sellenet, & Epiney, 2013). These limitations undoubtedly make it difficult to compare findings across the various studies, or draw firm conclusions. Given that pregnancy, and to a lesser extent the postpartum, is a process in itself with changing situational demands over the course of time, it has been argued that the appraisal and coping strategies used across these times may also change over time (Hamilton & Lobel, 2008; Lazarus, 1993). In turn, it has been argued that studies which assess coping repeatedly across time are needed, in an effort to better understand the processes in play (Pakenham, Smith & Rattan, 2007).
Most of the research to date on ante- and postnatal coping has examined coping at only one (e.g., Borcherding, 2009; Pakenham et al., 2007; Yali & Lobel, 1999), two (e.g., George, Luz, De Tycheey, Thilly, & Spitz, 2013), or three time-points (Hamilton & Lobel, 2008; Huizink et al., 2002). The results of these studies have shown that women use several coping strategies during pregnancy, including planning-preparation, avoidance, prayer (Hamilton & Lobel, 2008), problem-focused and emotion focused strategies (Huizink et al., 2002); and that coping can change over time. The use of limited time-points, however, makes it difficult to detect when changes occur, and what influence coping strategies may have at different times during the perinatal period.

When reviewing the studies that have focused on particular populations such as high-risk women in late pregnancy (Demyttenaere, Maes, Nijs, Odendaal, & Van Assche, 1995; Lowenkron, 1990), women fertilised by in vitro fertilisation (IVF) (Eugster & Vingerhoets, 1999; Lukse & Vacc, 1999), women with varying medical histories (Levy-Shiff, Lerman, Har-Even, & Hod, 2002), and women who have previously experienced perinatal loss (Nikcevic, Kuczmiérczyk, & Nicolaides, 1998), it is evident that while these studies provide valuable information, their results are not necessarily able to be generalized to the wider perinatal population. This is often the case as in contrast to high-risk pregnancies, women with a ‘typical’ pregnancy are said to be exposed to an ‘average’ amount of psychosocial stress (Huizink et al., 2002). Given that the majority of pregnant women fit within this category, it is vital that the commonly occurring processes of coping during ‘normal-risk’ pregnancy are investigated further.

Huizink et al. (2002) sought to address this particular issue by assessing coping in ‘low-risk’ women during early, mid, and late pregnancy. Using the 19-item Utrecht Coping List (UCL; Schreurs, Willinge, & Tellegen, 1988), two factors were identified: emotion-focused coping and problem-focused coping. Self-report data were also collected about locus of control, depression,
general anxiety, perceived stress and physical pregnancy complaints. Use of coping strategies was shown to change over the course of pregnancy as emotion-focused coping was used most frequently in early pregnancy, while problem-focused coping was used most frequently in mid-pregnancy. Coping also appeared to have an impact on concurrent distress, as emotion-focused coping in early-pregnancy and problem-focused coping in mid-pregnancy were associated negatively with distress in early and mid pregnancy, respectively. While this study demonstrated some possible patterns and associated impact that coping strategies may have during pregnancy, it has been argued that the use of a general coping measure may provide inaccurate or incomplete information, as it may fail to capture aspects of coping specific to the prenatal context (Hamilton & Lobel, 2008).

In an effort to assess pregnancy specific coping, Yali and Lobel (2002) developed the Prenatal Coping Inventory (PCI; Yali & Lobel, 1999), based on the theoretical framework proposed by Lazarus and Folkman (1984). The relationships between coping and emotional distress at 16 weeks and 26 weeks gestation were investigated in a sample of 163 women. Results revealed that use of preparation coping was associated with increased levels of emotional distress, while positive appraisal was the only strategy associated with lower distress levels. Prospective analyses did not show any associations between coping and distress over time. The only prospective effects noted were that early coping predicted later coping and early distress levels predicted later distress. Given that this study was limited to only two time-points, with coping assessed only once, it is difficult to ascertain both the trajectory of coping and distress across time, and the prospective relationships; thus further assessment is needed.

Hamilton and Lobel (2008) also examined coping in early, mid and late pregnancy in a sample of 321 women with pregnancies of varying medical risk using a revised version of the PCI. Three distinct types of coping were evident: Planning-Preparation, Avoidance and Spiritual-
Positive Coping. Results indicated that spiritual coping was the most frequently used strategy, while avoidant coping was used the least. Furthermore, while planning was used more consistently across pregnancy, the use of spiritual coping and avoidance differed across pregnancy. Hamilton and Lobel concluded that women appear to employ distinctive and varied strategies to manage stress prenatally and that coping is responsive to the changing demands across pregnancy.

Extending from the Yali and Lobel (2002) and Hamilton and Lobel (2008) studies, Borcherding (2009) explored patterns of coping in a sample of ‘healthy’ pregnant women using two coping measures (a pregnancy specific and a general measure), thus addressing two of the common limitations previously identified. Results revealed that Prayer and Task coping were the most frequently used coping strategies, while Avoidance was the least frequently used. Borcherding argued that pregnant women use a variety of coping strategies, and that additional research is needed with diverse samples to further explore coping strategies, including the influence that psychological factors may have. While this study recognised the importance of investigating coping in non high-risk pregnancies, and to the author’s knowledge is the sole study to date to include both a general and pregnancy specific measure of coping, certain limitations were noted, as women were excluded from the study if they were not first-time mothers, if they had any pre-existing medical conditions, or if they required any type of assistance in conceiving their current pregnancy. In addition, this study employed a cross-sectional design, with coping assessed at a single time-point (during the third trimester of pregnancy) and did not investigate any psychological factors.

In one of the few studies to focus exclusively on the relationship between anxiety symptoms and coping, George et al. (2013) explored these associations at two time-points: late pregnancy and at two months postpartum. Results indicated that women experiencing severe
anxiety symptoms in the last trimester of their pregnancy used coping strategies generally regarded as adaptive less frequently at that time (i.e., concurrent coping). This profile was then found to be significantly associated with anxiety post-birth. Furthermore, the higher the level of anxiety, the more likely was the use of problematic coping strategies such as denial and self-blame. George et al. argued that problematic coping may play a role in persisting anxiety, however once again this study was limited to two time-points and only assessed anxiety.

In the most recent study, Lau, Wang, Kwong and Wang (2015) investigated the direct and moderating effects of coping styles on perceived stress and antenatal anxiety symptoms in a sample of 755 women in China. Lau et al. used the Trait Coping Style Questionnaire, which explores the use of ‘positive’ and ‘negative’ coping styles. Results revealed a direct effect between negative coping and antenatal anxiety as women who used more negative coping styles were more likely to have higher anxiety symptoms. Somewhat surprisingly, no direct effect was evident between positive coping and antenatal anxiety. However, positive coping styles did appear to have an indirect effect on ameliorating antenatal anxiety symptoms for women who reported increased levels of perceived stress. Lau et al. suggested that negative coping styles may be a potential risk factor for antenatal anxiety and that this relationship needs to be further investigated. Given that this study was cross-sectional with coping again assessed at a single time point, Lau et al. highlighted the importance of longitudinal studies that explore the patterns of coping over time and the possible causal relationships. Furthermore, it seems feasible to suggest that studies which investigate the impact of specific coping strategies, as opposed to broad classifications such as ‘negative’ or ‘positive’ coping are likely to add to the current knowledge base as they are likely to inform us about which particular coping strategies elicit the negative or positive effects.
Studies that have employed a broader scope and included psychosocial factors have indicated that a bi-directional relationship may also exist between coping and emotional distress, albeit results have varied. Higher threat appraisal, wishful thinking and lower positive reappraisal coping during pregnancy have been related to increased depressive symptoms at the same time (Pakenham et al., 2007), while the use of maladaptive coping strategies such as negative appraisal (Honey, Bennett, & Morgan, 2003), and avoidant coping (Gotlib, Whiffen, Wallace, & Mount, 1991; Honey, Morgan, Bennett, 2002; Terry et al., 1996), have been linked to the onset of postnatal depression. Avoidance during pregnancy has also been associated with greater anxiety, depression and pregnancy-specific stress, while use of positive appraisal has been related to lower levels of anxiety and emotional distress in pregnancy (Da Costa et al., 2000; Yali & Lobel, 1999). When investigating predictors of coping, Huizink et al. (2002) found that both problem and emotion-focused coping were predicted by depression levels and situation appraisal, as well as demographic variables such as higher educational level and maternal age. In a similar study, Hamilton and Lobel (2008) found that pregnancy-specific distress strongly predicted planning but also avoidance, with high state anxiety also predicting use of avoidance.

While the findings of previous studies have shown that appraisal and coping processes appear to have some type of association with maternal distress symptoms, Pakenham, Smith, and Rattan (2007) argued that there is a need to investigate protective and risk factors associated with maternal depression (and arguably other factors as well) in the context of a theoretical framework. In turn, Pakenham et al. examined the utility of stress/coping model of antenatal depressive symptomatology, in which the direct and moderating effects of appraisal and coping on depression were explored. A total of 424 women completed measures pertaining to life events, coping resources (social support, quality of women’s earlier relationships with
their parents), appraisal and coping strategies (wishful thinking, positive reappraisal, problem solving, emotional approach) during the third trimester of pregnancy. Results indicated that higher depression was related to higher stressful life events, threat appraisal, wishful thinking and lower positive reappraisal coping. The hypothesized exacerbation effects of wishful thinking on depression was supported, however there was no support for the expected buffering effects of coping on depression.

Pakenham et al. (2007) argued that processes such as appraisal and coping are likely to be useful when designing interventions targeting maternal depression. Given that this study was limited to only a single time-point, they also noted that future studies that assess depression, appraisal, and coping across each trimester of pregnancy are needed, in order to better understand the development of antenatal depression. Such studies would also extend the current knowledge base in regards to which theoretical framework and model may best account for the development and/or maintenance of maternal distress.

The transactional model of stress and coping proposed by Lazarus and Folkman (Lazarus & Folkman, 1984) has often been used as the theoretical framework in a number of the studies outlined above, given that it was developed specifically to guide the understanding and investigation of how one copes with a stressful situation. In turn, it appears to be particularly appropriate and relevant to the experience of pregnancy, birth, and the postpartum period given the many demands and changes that occur during this time. In order to adopt a broader conceptualization of maternal distress, that includes symptoms of anxiety and stress as well as depression, it is necessary to investigate not only the trajectory of these symptoms, but also (and perhaps more importantly) the mechanisms that account for why and how these symptoms are developed in the first place. The following section will describe Lazarus and Folkman’s (1984) Transactional Theory of Stress and Coping followed by the Biopsychosocial model for postnatal
depression (Milgrom et al., 1999). A conceptual model of maternal distress for the antenatal and postnatal period incorporating these two frameworks is then presented.

**Transactional Theory of Stress and Coping**

The Transactional Theory of Stress and Coping, (Lazarus & Folkman, 1984) views stress as a dynamic process, rather than an isolated event or response, which is relational in nature. One of the core premises of the Transactional Theory is that stress is a ‘person-situation’ interaction, which is dependent on the subjective cognitive judgment that arises out of the interplay between an individual and their environment (Zakowski, Hall, Klein, & Baum, 2001). Thus, no event or situation in itself is considered to be inherently stressful; but rather stress is conceptualised as a state that results when the transactions between an individual and their environment lead the individual to perceive a discrepancy between the demands of the situation and their resources (Lazarus, 1993).

Given that the dynamic exchanges are central to this theory, an individual experiencing some form of stress is seen as an active agent who can directly influence the impact of the stressor through behavioural, cognitive and emotional strategies. Central to this theory, are two key concepts: the process of cognitive appraisal, and the coping strategies applied to manage the demands of the situation (Lazarus & Folkman, 1984).

**Appraisal**

Cognitive appraisal is essentially a judgement process, whereby an event or stimulus is evaluated in regards to the significance or meaning it holds for one’s personal wellbeing (Lazarus & Folkman, 1984). During this process, an individual assesses whether a particular situation threatens their wellbeing (primary appraisal phase), and whether they possess the resources needed to meet the demands of the stressor (secondary appraisal phase).
The primary appraisal stage is when an individual gives meaning to the situation (Lazarus & Folkman, 1984). During this phase, the individual can make one of three appraisals: (1) that the situation is ‘irrelevant’ if the situation is deemed to have no significant implications for the individual; (2) that the situation is “good” or ‘benign-positive’ if the situation is deemed to have some possible benefits for the individual; or (3) that the situation is ‘stressful’ if the situation is deemed to be potentially threatening (Lazarus & Folkman, 1984).

In addition, three further types of stress appraisals can be made: harm/loss; threat and challenge. Harm-loss appraisals refer to the amount of damage, personal injury or loss that has already occurred, such as damage to one’s confidence, or the loss of a loved one. Threat appraisals refer to the expectation of future harm, for example the fear of experiencing complications during the birth process. Much stress depends on appraisals that involve harm-loss and threat. Challenge appraisals in contrast, refer to the perception of stress in a positive way. That is, the situation is perceived as an opportunity for growth, mastery, or some form of gain, such as when the stress of a higher-level job is seen as an opportunity to demonstrate one’s ability and increase one’s income (Lazarus & Folkman, 1984).

These appraisals are often influenced by one’s own prior experiences and tend to generate quite distinct emotional responses: harm/loss stressors often elicit anger, sadness and disappointment; threatening stressors are commonly associated with anxiety and fear, while challenging stressors can often produce excitement, exhilaration and determination (Cohen, 1984; Lazarus & Folkman, 1984). Secondary appraisal occurs after an event is deemed to be either a threat or a challenge and is an assessment of one’s coping resources and options (Cohen, 1984). Thus, secondary appraisals largely address what one can do about the situation, and evaluate the potential benefits and consequences of a particular coping strategy, given the individual’s goals and constraints (Folkman, 1982).
Finally, a third appraisal process may occur, namely re-appraisal, which refers to a successive valuation based on new information obtained from the environment and/or individual. This re-appraisal process differs from the primary appraisal, only in that it follows a prior cognitive evaluation. The effectiveness of the coping strategies selected for use during the secondary appraisal process will often determine whether re-appraisal needs to occur. In turn, the process of appraisal is conceptualised as a perpetual process, evolving in time as the individual re-appraises the stressor and the resources needed to cope.

Coping

Coping is a process that involves some form of thought, behaviour or feeling that is used, modified or eliminated in an effort to deal with an event that elicits some form of psychological stress (Lazarus & Folkman, 1984). At times, the question arises as to what the difference is between a coping strategy and a defense mechanism. While both of these processes are considered to be adaptational processes often used by individuals in an effort to protect themselves from stress or deal with emotional distress, they can be differentiated on the basis of the psychological processes that are involved, as opposed to the outcome of the process (Cramer, 1998). Two key criteria that are central to differentiating between defense and coping processes include the conscious versus unconscious, and the intentional/unintentional nature of the processes (Kramer, 2010). Specifically, coping strategies tend to involve a conscious, purposeful effort, while defense mechanisms often occur without conscious effort and/or awareness (Cramer, 2006). Coping strategies are also usually employed with the specific intent to manage or resolve a problematic situations, a quality that defense mechanisms often lack.

According to the Transactional Theory, coping is not considered to be a personality trait or style that remains stable across various situations, but rather as a set of strategies that can be implemented to deal with specific situations. Lazarus and Folkman (1984) argue that there are
two broad types of coping: problem-focused coping and emotion-focused coping. Problem-solving coping refers to strategies that are largely directed at altering the stressful situation by some form of direct action. This type of coping is usually implemented when the stressful event is appraised as being amenable to change and often includes strategies such as planning a potential course of action or seeking to acquire a new set of skills or information.

In contrast, emotion-focused coping refers to strategies that are primarily aimed at changing the way one thinks and/or feels about the stressful situation, thus the focus is on one’s internal emotional state, rather than the external situation. Emotion-focused coping is most likely to occur when an appraisal has been made that nothing can be done to change the stressful situation, and often includes strategies such as avoidance, wishful thinking or cognitive restructuring (Lazarus, 1993; Terry, 1991a; 1991b).

Given that past research has implicated cognitive appraisal and coping strategies with maternal distress symptoms, and the inherently unique and stressful nature of the ante- and postnatal period, it has been argued that research investigating stress and coping in the context of the perinatal period needs to include measures of external stressors, appraisal and coping processes (Ayers, 2001). Furthermore, given that the relatively limited research to date has focused largely on depression as the measure of emotional distress, there seems to be a clear need to broaden the scope so as to include maternal anxiety and stress, as well as other factors that may be relevant. To the author’s knowledge no study to date has examined the course of appraisal and coping across the perinatal period and/or the direct effects they may have on maternal distress symptoms.

**Biopsychosocial Model for Perinatal Distress**

The importance of other factors that may be impacting on emotional distress during the perinatal period was highlighted by Milgrom, Matin and Negri (1999) who conceptualised a
groundbreaking theoretical model of postnatal depression (PND). This model was largely based on the biopsychosocial model first developed by George Engel (1980). Milgrom et al.’s model of postnatal depression recognised the importance of a wide range of factors, and thus considered the importance of vulnerability factors, precipitating factors, sociocultural factors as well as exacerbating and maintaining factors in the context of how postnatal depression is developed and maintained.

The model is referred to as a biopsychosocial model given that it includes biological factors, such as genetic influences on personality or a predisposition to mental health difficulties (i.e., family history); psychological factors, such as earlier familial experiences and coping styles; and social factors, such as the presence of marital or relationship dissatisfaction and societal expectations. This model also acknowledges that while precipitating factors may trigger postnatal depression in vulnerable women, the presence of other factors are also crucial. Milgrom et al. also highlighted the importance of cognitive factors, as it is argued that an individual’s cognitive appraisal of their recent life events and social support for example, are most important rather than the objective reality of the situation. How a woman, and her significant others, react to the development of depression is also argued to be significant, as maladaptive behaviours or ways of coping may either maintain or potentially exacerbate the symptoms of depression.

The biopsychosocial model encourages researchers and clinicians to investigate experiences such as depression by considering all the relevant biological, psychological, and social factors that might be contributing to the development and/or maintenance of the depression. While this model was initially developed in regards to the experience of postnatal depression, it seems feasible to suggest that it is applicable to antenatal depression as well. That is, while certain differences do exist in regards to the specific risk factors for depression
antenatally, as opposed to post-birth, the key variables extend across biological, psychological, and social domains during both periods of time. Furthermore, it also appears likely that the biopsychosocial model is also applicable to the experience of anxiety and stress, whereby these experiences result from a complex interplay of various factors.

A Model of Proposed Factors Predicting Maternal Distress during the Perinatal Period

When one considers the transactional theory of stress and coping and the biopsychosocial framework in unison, or as complementary, it becomes apparent that a number of key factors need to be considered when conceptualizing any models of perinatal distress. Assessing all possible factors that may contribute to the onset of distress is obviously outside the scope of the current thesis, thus Figure 1 shows the factors that are hypothesized to impact on maternal distress (depression, anxiety and stress) throughout pregnancy and the postpartum, which were the focus of this program of research, including the hypothesized unique effect of coping and appraisal. The rationale for including these factors as potential predictors of maternal distress is presented thereafter.
Figure 1. Proposed transactional model of maternal distress during pregnancy and the first postpartum year

Key:
- Stability over Time
- Prospective Relationship
Risk Factors for Perinatal Depression and Anxiety

Psychosocial risk factors appear to be the most consistent predictors of perinatal depression, and to a lesser extent anxiety, with the strongest predictors being: a past history of depression and/or anxiety (Milgrom et al., 2008; O’Hara & Swain, 1996), a family history of depression and/or other mental health disorders (Milgrom, Ericksen, Negri & Gemmill, 2005; Robertson, Green, Wallington & Stewart, 2004), marital/relationship discord or lack of support from one’s partner (Fisher, Feekery & Rowe-Muuray, 2002; Garcia-Esteve et al., 2008; Glazier, Elgar, Goel & Holzapfel, 2004; Hopkins & Campbell, 2008; Milgrom et al., 2008; O’Hara & Swain, 1996), a lack of practical, emotional, financial, and/or social support (Boyce, 2003; Gurung, Dunkel-Schetter, Collins, Rini & Hobel, 2005; Lee et al., 2007; Milgrom et al., 1999; 2008), and the presence of significant life events (Boyce, 2003; Dennis, Janssen, & Singer, 2004; Rubertsson et al., 2005). Other maternal factors such as self esteem (Beck, 2001; Fontaine & Jones, 1997; Lee et al., 2007) and sleep quality (Field et al., 2007; Jomeen & Martin, 2007; Skouteris, Wertheim, Germano, Paxton & Milgrom, 2009) have also been implicated in the experience of perinatal depression and anxiety.

Self-Esteem

Self-esteem as a concept is connected to the way that individuals’ look and feel about themselves (Fontaine & Jones, 1997; Rosenberg, 1965). Hence, it comes as no surprise that previous research has implicated self-esteem with maternal depression, anxiety as well as parenting stress (Ritter, Hobfoll, Lavin, Cameron & Hulsizer, 2000; Kamysheva et al., 2008; Saisto et al., 2008). Self-esteem has often been reported to be a strong predictor of depression during pregnancy and the postpartum period (Beck, 2001; Fontaine & Jones, 1997; Lee et al., 2007).
In a longitudinal study with 357 pregnant women Lee et al. (2007) found that low self-esteem was the strongest predictor for anxiety and depression across all three trimesters. It was argued that pregnant women with low self-esteem may be particularly vulnerable to developing maternal distress as they may be ill-equipped to face the multitude of challenges and stressors associated with pregnancy and the impending birth of an infant; and may thus, be more prone to anxiety and depressive symptoms throughout all stages of pregnancy (Littleton, Breitkopf, & Berenson, 2007). Healthy self-esteem is thought to perhaps provide a buffer against the negative effects of stressful life events (Olioff & Aboud, 1991). Thus, mothers with higher levels of self-esteem may have the ability to better withstand the stressors that may jeopardize their sense of self-worth and contribute to the development of maternal distress. Given the strong relationship between self esteem and depression, it seems feasible to suggest that maternal self-esteem needs to be taken into account and controlled for when exploring the unique role that appraisal and coping strategies may have on distress levels.

Social Support

Interpersonal relationships between a pregnant woman and the significant others in her life (i.e., partner, family, friends) have been linked with women’s psychological well-being (Milgrom et al., 1999; 2008). The results of several studies have shown that low levels of social support are significant risks factors for antenatal and postnatal depression (Brugha et al., 1998; Honey, Bennett et al., 2003; Ngai, & Ngu, 2015; Ritter et al., 2000). Given that pregnancy and the birth of an infant places significant demands on the mother and her family, there is an increased need for practical and emotional support during these times.

Dissatisfaction with the level of support available has been associated with a higher risk for developing postnatal depression (Boyce, 2003; Fisher et al., 2002; Glazier et al., 2004), and an
increase in anxiety (Gurung et al., 2005; Lee et al., 2007; Littleton et al., 2007). Of particular importance appears to be the support available from one’s partner, as well as the availability of other people to depend on during pregnancy and the postpartum (Pope, 2000). Whilst women who have a small social network appear to have an increased risk of developing postnatal depression (Beck, 1996; O’Hara & Swain, 1996), the quality of the support is argued to be crucial, rather than the actual size of the social support network (Brugha et al., 1998; Fisher et al., 2002).

It is important to highlight that the interrelationship between emotional distress and social support is far from simple. For example, while lower levels of social support are predictive of increased emotional distress, the continued presence of emotional distress is likely to influence one’s perceptions of social support, as well as their ability to seek out appropriate support, thus leading to a further reduction in one’s support network (Cigoli, Gilli, & Saita, 2006; Dennis & Ross, 2006; Logsdon & Usui, 2001). Furthermore, Lee et al. (2007) found that low levels of social support at different time-points yielded different effects. Low levels of perceived social support was associated with an increased risk of anxiety only in the second trimester, while an increased risk of depression was evident during the first and third trimester, but not the second trimester. Thus it seems that when exploring the unique impact that other factors may have on the development of maternal distress (i.e., appraisal and coping), it is important to account for the effects of social support at different times.

Marital/Relationship Quality

The relationship with one’s spouse or partner is by far one of the most important factors in regards to a mother’s emotional wellbeing (Pope, 2000). Past research has consistently shown that low partner support is a key risk factor for ante- and postnatal depression (Fisher, et al., 2002; Garcia-Esteve et al., 2008; Hopkins & Campbell, 2008; Milgrom et al., 2008; O’Hara &
Swain, 1996). While the links between marital status and maternal depression remain unclear, it has become evident that being in a maladaptive, unsupportive interpersonal relationship increases the risk of postnatal depression (Boyce, 2003).

Unrealistic demands and expectations from one’s partner can place undue stress on one’s self, which can in turn contribute to the development of depression and anxiety (Dimitrovsky, Levy-Shiff, & Schattner-Zanany, 2002). Lee et al. (2007) found that low marital satisfaction was associated with an increased risk of anxiety in the third trimester and an increased risk of depression in the second trimester. Studies have also found that partner conflict during pregnancy is related to pregnancy specific worries or concerns (Da Costa, Larouche, Dritsa, & Brender, 1999; Westbrook, 1978), increased symptoms of anxiety and depression (Brown, 1994; Dimitrovsky, Perez-Hirshberg, & Itskowitz, 1987; Glazier et al., 2004), and not surprisingly, is related inversely to perceived social support (Brown, 1994; Dimitrovsky et al., 1987).

De Judicibus and McCabe (2002) investigated the influence of role quality, relationship satisfaction, fatigue and depression during pregnancy and after childbirth and found that women with higher relationship satisfaction were more positive about their anticipated role as a mother, while also reporting lower rates of fatigue and depressive symptomatology. In light of these findings, it seems plausible to suggest that increased marital/relationship quality might buffer against the development and/or maintenance of depression, anxiety and stress, as well as other negative experiences such as extreme fatigue, thus allowing a woman to cope better with the various demands associated with her role as a mother. In the context of exploring the unique role that appraisal and coping may have on maternal distress it seems important to account for the effects of relationship quality in an effort to yield more meaningful results.
Life Events

Life events can be considered as ‘significant’, as opposed to ‘everyday’ events, when a certain amount of adjustment is required in response to acute changes occurring within a relatively short period of time (Holmes & Rahe, 1967; Rahe, 1990). These events are deemed stressful when they overwhelm an individual’s ability to cope or adjust to the situation, thereby increasing the likelihood of some form of psychological distress developing. The occurrence of one or more significant life events within a 12 month period has previously been associated with psychological distress including ante- and postnatal depression (Dennis, Janssen, & Singer, 2004; Thoits, 1995). The adjustment to parenthood extends across pregnancy, the birthing experience, as well as the postpartum, all of which are accompanied by stressful life changes and are considered to be significant life events (Robertson et al., 2004; Holmes & Rahe, 1967).

Significant life events, especially those regarded as negative, have been shown to contribute to changes in levels of stress, mood, anxiety as well as immune functioning (Baum, Cohen, & Hall, 1993; Dixon & Reid, 2000; Suedfield & Pennebaker, 1997) and can interact with other vulnerability factors (O’Hara, Schlechte, Lewis, & Varner, 1991). While the specific role of negative life events in the development of depression remains unclear, there is evidence to suggest that such events can contribute to the onset and maintenance of a depressive episode (Billings & Moos, 1982; Lightsey, 1997). In contrast, the occurrence of ‘positive’ life events, have been shown to counter against stress, partly by increasing positive emotions (Dixon & Reid, 2000; Kreitler, Aronson, Berliners, Kreitler, Weissler, & Arber, 1995).

Previous studies have reported that the experience one (Boyce, 2003) or two life events (Rubertsson et al., 2005), in the 12 months preceding childbirth is associated with the development and severity of postnatal depression. Depressed mothers have previously been
found to report more negative life events (Webster-Stratton & Hammond, 1988), however it is unclear whether this is a ‘symptom’ of the depression, where depressed mothers adopt a cognitive attribution style that reflects a more negative view of self, events and others. Irrespective of the nature of this relationship, it again seems important to account for the impact of significant life events when assessing the possibly unique role of cognitive appraisal and coping strategies.

**Sleep Quality**

Sleep disturbances are frequently reported by pregnant women (Dzaja et al., 2005; Lee & Gay, 2004), which often vary depending on the stage of pregnancy, such as an increase in daytime sleepiness during the first trimester (Lee, Zaffke, & McEnany, 2000) and disturbed sleep in the third trimester (Viegas, Rodrigues, Silva, & Arboes, 2000). Sleep disturbances have also been associated with impairment in daily functioning, which can often include changes in mood (Pilcher & Huffcutt, 1996). Given that sleep quality plays a pivotal role in optimal physical functioning and mental health during pregnancy (Jomeen & Martin, 2007), it is somewhat surprising that the relationship between sleep quality and maternal distress has not been investigated more thoroughly.

Jomeen and Martin (2007) investigated the relationship between sleep quality and depression in early pregnancy and found that depressed women were also experiencing significantly poorer sleep quality in comparison to non-depressed women. Field et al. (2007) also investigated sleep disturbances during the second and third trimester and found that during both of these trimesters elevated levels of depression and anxiety were associated with more sleep disturbances. Furthermore, when observing the newborns of the depressed mothers, they were also found to be experiencing more sleep disturbances which included spending less time
in deep sleep and more time in disorganized sleep. Kamysheva et al. (2008) also found an association between poorer sleep quality, lower levels of self-esteem and increased depressive symptoms.

Skouteris, Germano, Wertheim, Paxton, and Milgrom (2008) investigated the prospective relationship between depressive symptoms and sleep quality at three time-points throughout pregnancy. While sleep quality levels remained relatively stable across time, sleep quality earlier in pregnancy was found to predict higher levels of depressive symptoms later in pregnancy. The relationship between sleep quality and depression was further explored by Skouteris, Wertheim, Germano, Paxton, and Milgrom (2009), during mid and late pregnancy. Results again indicated that poorer sleep quality prospectively predicted increases in depressive symptoms. Collectively, these results indicate that elevated levels of fatigue and reduced sleep quality may be a critical factor in the development of mood disturbances during pregnancy and the postpartum and thus these effects ought to be controlled for when exploring the unique impact that other factors may have.

**Summary and Rationale**

Perinatal mental health continues to be an important issue both in Australia and internationally. Previous studies have highlighted significant prevalence rates for both depression and anxiety, however a comprehensive trajectory of stress, anxiety, and depressive symptomatology across pregnancy and the first postpartum year is lacking. This deficit is further highlighted when one considers the relatively limited data available from Australian samples. The limited research to date has also predominantly focused on the postpartum period, thus resulting in a significant gap in the antenatal literature. Furthermore, while past research has demonstrated that an interrelationship between anxiety and depression exists, it is not clear at
what specific time-points these affective states are most predictive of later depression, anxiety and/or stress. Additionally, while the appraisal and coping strategies employed by women during this time of transition have been implicated as potentially key factors in the development of depression and to a lesser extent anxiety in recent years, no study to date has investigated the influence of cognitive appraisal and coping strategies as unique predictors of depression, anxiety and stress, after the effects of well established risk factors have been controlled for, during pregnancy and the first postpartum year. From a clinical perspective, appraisal and coping strategies are of particular interest and importance as it may be possible to directly target them in interventions. For example, while other key risk factors such as one’s past mental health history or the life events recently experienced cannot be altered, how an individual appraises their current situation and the strategies they employ to cope with this situation are likely to be amenable to change, particularly if their impact is better understood.

There appears to be a need to continue to expand the current research and knowledge base by broadening the scope of perinatal distress to include symptoms of depression, anxiety and stress; as well as examining the role that cognitive appraisal and coping strategies have, in an effort to better understand the complex pathways that contribute to the development of depression, anxiety and stress during the perinatal period. Results from such studies are likely to have implications not only for theory development in the antenatal and postnatal field, but will also inform mothers and numerous health professionals including obstetricians, midwives, general practitioners, and psychologists on the presence of critical periods where early intervention may be warranted, as well as the factors that might contribute to maternal distress before and after birth.
In summary, to the author’s knowledge, no existing studies have examined the trajectory of depression, anxiety and stress symptoms within the one study, during both the antenatal and postnatal period. Furthermore, no studies to date have investigated the interrelationships between coping strategies and depression, anxiety and stress symptoms; or the specific impact that cognitive appraisal and coping strategies may have on depression, anxiety and stress levels.

The aim of the first study, which was published in the *Journal of Women and Birth* in January 2014, was to review and discuss whether the term 'perinatal distress' accurately encapsulates the range of challenges experienced during the perinatal period, when the scope of distress is limited to the experience of depression and anxiety alone (please refer to Chapter 3). A review of the literature was conducted, to identify past research that has focused on the experience of stress as a distinct affective state in the perinatal period. As part of this review, the argument that stress as a separate emotional state during the perinatal period needs to be investigated was reiterated, in order to assess if and how stress differs from depression and/or anxiety; and whether this will allow for a more comprehensive and accurate understanding of women’s experiences during their transition to motherhood.

The aim of the second study, which was published in the *Journal of Women and Birth* in September 2014, was to investigate the trajectory of depression, anxiety and stress symptoms throughout pregnancy on a monthly basis, while also exploring the prospective relationships between these symptoms (please refer to Chapter 4). It was hypothesized that significant changes would be evident across the different time points in symptoms of maternal depression, anxiety and stress. Given that these symptoms have previously been assessed at inconsistent time-points, specific predictions about the times at which symptoms would peak were not made a priori.
The aim of the third study, which was submitted to the *Journal of Anxiety, Stress and Coping* in April, 2015, was to investigate the types of coping strategies used by women across the perinatal period, while also examining the prospective and concurrent relationships between coping and depressive, anxiety and stress symptoms (please refer to Chapter 5). It was hypothesized that coping strategies would change over time and would impact upon symptoms of maternal depression, anxiety and stress. Once again given that the relationships between coping and distress symptoms have not been previously assessed at consistent time-points, specific predictions about the times at which coping strategies would impact on distress symptoms were not made.

The aim of the fourth study, which was submitted to the *Archives of Women’s Mental Health* in July 2015, was to explore the role of cognitive appraisal and coping strategies in the development of perinatal depression, anxiety and stress, after controlling for the effects of well established factors (self-esteem, social support, sleep quality, marital/relationship quality and significant life events), both pre and post birth (please refer to Chapter 6).

Chapter 2 of this thesis will outline the methodology and participant characteristics for all studies conducted, while Chapter 7 collectively discusses the findings of the four studies and implications for future research and practice.
References


Chapter 2

Method

Procedure

Prior to commencing this research study, approval was obtained from the Deakin University Human Research Ethics Committee (refer to Appendix A). The participant sample was recruited using a number of strategies; including advertising in online parenting related forums, community newspapers and magazines, and general word-of-mouth promotion. The advertisements invited women who were 10-16 weeks gestation to participate in a research study focusing on maternal and infant wellbeing. Information regarding the purpose of the study, the type and frequency of data collection, as well as the contact details for the project manager were included in the advertisements (refer to Appendix B). The research team as well as some of participants themselves also promoted the study via general word-of-mouth. Given that this was a longitudinal study which extended over an 18 month period, participants who remained in the study for the entire duration were entered into a draw to win one of ten $50.00 gift vouchers.

Women who were interested in taking part in the study contacted the project manager to express their interest. A copy of the cover letter, plain language statement (PLS), and consent forms were then sent out to the women with a reply paid envelope (refer to Appendix C). The PLS provided prospective participants with further information regarding the aim of the study, the approximate time it would take to complete the relevant questionnaires at each time point, and examples of questions that would be asked. Information pertaining to confidentiality, consent, right to withdraw, as well as the possible benefits and risks of participating in this study were also provided. The names and contact details for the research team as well as the Deakin
University Human Research Ethics Committee were also included. In an effort to protect the anonymity of the participants, a study ID number was assigned to each woman, and this ID number was the only identifying marker printed on the questionnaires which were sent out. Personal identifying information such as the names of the participants, contact details and their ID number were kept in separate files.

The initial time point was completed at 16 weeks gestation, and questionnaires were then sent out on a monthly basis, with a total of 18 study time-points. This included six antenatal time-points: Time 1: 16 weeks ($M = 16.54$ weeks, $SD = 0.94$), Time 2: 20 weeks ($M = 20.55$ weeks, $SD = 0.98$), Time 3: 24 weeks ($M = 24.42$ weeks, $SD = 0.82$), Time 4: 28 weeks ($M = 28.30$ weeks, $SD = 0.95$), Time 5: 32 weeks ($M = 32.61$ weeks, $SD = 0.82$) and Time 6: 36 weeks ($M = 36.45$ weeks, $SD = 0.74$) gestation; and 12 postnatal time-points: Time 7: 1 month ($M = 4.49$ weeks post-birth, $SD = 1.19$), Time 8: 2 months ($M = 9.06$ weeks post-birth, $SD = 1.22$), Time 9: 3 months ($M = 13.31$ weeks post-birth, $SD = 1.76$), Time 10: 4 months ($M = 17.39$ weeks post-birth, $SD = 1.90$), Time 11: 5 months ($M = 21.54$ weeks post-birth, $SD = 1.26$), Time 12: 6 months ($M = 25.99$ weeks post-birth, $SD = 2.07$), Time 13: 7 months ($M = 29.84$ weeks post-birth, $SD = 1.70$), Time 14: 8 months ($M = 34.13$ weeks post-birth, $SD = 1.83$), Time 15: 9 months ($M = 38.48$ weeks post-birth, $SD = 3.02$), Time 16: 10 months ($M = 42.88$ weeks post-birth, $SD = 3.38$), Time 17: 11 months ($M = 47.48$ weeks post-birth, $SD = 2.38$), and Time 18: 12 months ($M = 52.51$ weeks post-birth, $SD = 1.53$), postpartum.

The data collected at the six antenatal time-points was used in Study Two; data from three antenatal time-points (16, 24 and 32 weeks gestation), and three postnatal time-points (3, 6, 9 and 12 months postpartum) were used in Study Three; and finally data from two antenatal
time-points (16 weeks gestation and 32 weeks gestation), and two postnatal time-points (3 months and 12 months postpartum) were used in Study Four.

Participants

Study Two. Two hundred and fourteen pregnant women aged between 19 and 44 years old ($M=30.67$, $SD=4.29$) from various states of Australia took part in this study. The majority of women were tertiary educated (60.3%), married (75.2%), and were born in Australia (84.1%). At the first study time-point, 79.4% were engaged in some form of paid employment, with an annual family income in excess of $105,000 reported by 63.9% of the sample.

Study Three. Two hundred and eighty-three women participated in this study, with an age range between 19 and 44 years ($M = 30.92$ years, $SD = 4.27$). The majority of the women were married (77.0%), and were born in Australia (84.5%). At the commencement of the study, most of the women were in paid employment (78.8%); with 50.0% working full-time. An annual family income in excess of $105,000 was reported by 62.9% of the women. Fifty-six percent of the participants were primiparous; with 10.7% of the women reporting that they required assistance conceiving their current pregnancy.

Study Four. The 283 women who comprised the participant sample in Study Three, were the same women who took part in Study Four, thus the same demographic information applies.

Overall, the participant sample is not grossly dissimilar to the ‘average’ Australian in recent years. For example, during the past three years the average age of an Australian has been 37 years of age, with a combined family income of $145,400. Nearly 45% of Australians aged 25 to 34 have attained tertiary education, with the majority in paid employment. Over two-thirds of adults (69%) had been married at some point in their lives with 74% of residents being born in Australia (Australian Bureau of Statistics, 2012; 2014).
Materials

As can be seen from Appendix D (example of a Pregnancy Questionnaire Pack) and Appendix E (example of a Postpartum Questionnaire Pack) data was collected for a wide range of variables. Every month women completed measures pertaining to depression, anxiety and stress. At 16 weeks, 24 weeks and 32 weeks gestation; and at 3 months, 6 months, 9 months and 12 months postpartum, additional questionnaires were completed. Given that the vast magnitude of this data extended beyond the scope of this thesis, and in an effort to retain adequate statistical power for the analyses conducted, the variables investigated in Study Two, Three and Four were limited to those summarised in Table 1.

Table 1

Variables assessed in Study Two, Study Three, and Study Four

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<tr>
<th>Measured in Study Two</th>
<th>Measured in Study Three</th>
<th>Measured in Study Four</th>
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<td>Depression</td>
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<td>Anxiety</td>
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<td>Significant Life Events</td>
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The questionnaires noted in Table 1, enquired about the following information:

**Demographics Questionnaire.** The Demographics Questionnaire obtained information regarding maternal age, annual household income, parity status, employment and marital/relationship status, as well as information regarding women’s place of birth.

**Perinatal Depression.** The Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden & Sagovsky, 1987) was used to measure levels of depressive symptomatology in all three studies. The EPDS is a 10-item self report scale which assesses depressive symptoms experienced within the previous week. Responses to statements are scored on a 4-point Likert scale ranging from 0 to 3, with higher scores indicative of greater intensity of depressive symptoms. The EPDS was initially developed for use with postnatal women and later validated for use with antenatal women also (Bergink et al., 2011). The EPDS has become one of the most frequently used measures in regards to screening for perinatal depression, and has been extensively used across various settings and cultures with sensitivity levels of .86, specificity levels of .76 and strong reliability with Cronbach’s alpha .87 (26). In Study Two Cronbach’s alpha for internal consistency ranged from .76 to .83. In Study Three Cronbach’s alpha for internal consistency ranged from .78 to .88. In Study Four Cronbach’s alpha for internal consistency ranged from .77 to .86.

**Anxiety and Stress.** Perinatal anxiety and stress were assessed using the Anxiety and Stress subscales from the Depression, Anxiety and Stress Scales – short form (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 is a short form of the original 42-item scale consisting of 21 items, with 7 items in each category of Depression, Anxiety and Stress symptoms. The 7 anxiety and 7 stress items were used in the present study. Individuals are asked to respond to the statements using a 4-point Likert type scale ranging from 0 (Did not
apply to me at all) to 3 (Applied to me very much, or most of the time). In turn, elevated scores are indicative of higher levels of anxiety and stress.

The DASS-21 is a widely used, standardised instrument found to reliably distinguish between the symptoms of depression, anxiety and stress in clinical as well as non-clinical samples (Anthony, Bieling, Cox, Enns & Swinson, 1998; Henry & Crawford, 2005), and has demonstrated strong reliability and validity with Cronbach’s alpha .87 and .91 for anxiety and stress respectively (Crawford & Henry, 2003). In Study Two alpha coefficients ranged from: .64 to .74 for the Anxiety subscale, and .75 to .83 for the Stress subscale. In Study Three alpha coefficients ranged from: .61 to .74 for the Anxiety subscale, and .79 to .89 for the Stress subscale. In Study Four alpha coefficients ranged from: .61 to .70 for the Anxiety subscale, and .78 to .88 for the Stress subscale.

**Social Support.** The Multidimensional Scale of Perceived Social Support (MSPSS: Zimet, Dahlem, Zimet, & Farley, 1988) was used to assess social support. The MSPSS is a 12-item scale which assesses perceived social support from family, friends and a significant other, which yields a total perceived social support score. Responses to statements are scored on a 7-point Likert scale ranging from 1 (Very Strongly Disagree) to 7 (Very Strongly Agree), with increased scores indicative of higher levels of support. The MSPSS has been extensively used across various countries and settings, including obstetric populations demonstrating strong reliability with Cronbach’s alpha of .91 (Skouteris Wertheim, Germano, Paxton, & Milgrom, 2009; Zimet, Powell, Farley, Werkman, & Berkoff, 1990). In Study Two Cronbach’s alpha for internal consistency ranged from .90 to .92. In Study Four Cronbach’s alpha for internal consistency ranged from .91 to .92.
Sleep Quality. The Pittsburgh Sleep Quality Index (PSQI: Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) was used to assess sleep quality. The PSQI is a 18-item self report scale which assesses seven components of sleep, namely subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. Responses to statements are scored on a 4-point Likert scale ranging from 0 (Not during the past month) to 3 (Three or more times a week). The seven component scores are summed to yield a global PSQI score, ranging from 0-21, with global scores of 5 or greater indicative of “poorer” sleep quality. The PSQI has been used across numerous settings, including perinatal populations, and has demonstrated good reliability with Cronbach’s alpha .71, .78 (Moss, Skouteris, Werthem, Paxton, & Milgrom, 2009; Skouteris et al., 2009). In Study Two Cronbach’s alpha for internal consistency ranged from .69 to .71. In Study Four Cronbach’s alpha for internal consistency ranged from .67 to .73.

Prenatal Specific Coping. The Revised Prenatal Coping Inventory was used to assess pregnancy specific coping strategies (NuPCI; Hamilton & Lobel, 2008). The NuPCI is comprised of 32 items scored from 0 (Never) to 4 (Almost Always). Items are summed with responses comprising three subscales: Planning-Preparation (15 items); Avoidance (11 items) and Spiritual-Positive (6 items) Coping. The NuPCI was developed specifically for the use within the antenatal period and has demonstrated strong internal consistency with an alpha of .86, .90 and .70 for the Planning-Preparation, Avoidance, and Spiritual-Positive scales respectively (Hamilton & Lobel, 2008). In Study Three Cronbach’s alpha ranged from: .85 to .86 for the Planning/Preparation subscale, .73 to .79 for the Avoidance subscale, and .71 to .74 for the Spiritual subscale. In Study Four only the Avoidance subscale was included in the analyses with a Cronbach’s alpha of .76.
General Coping. The COPE Inventory was used to assess general coping strategies (COPE; Carver, Scheier, & Weintraub, 1989). The COPE is a 60-item self report scale which assesses what individuals generally do and feel, when they experience stressful events. Responses to statements are scored on a 4-point Likert-type scale ranging from 1 (I usually don’t do this at all) to 4 (I usually do this a lot), with higher scores indicating greater use of the given coping strategy in response to stressful events. Items are summed with responses forming a total of 15 subscales (each subscale is comprised of 4 items), namely: Positive Reinterpretation and Growth, Mental Disengagement, Focus on and Venting of Emotions, Use of Instrumental Social Support, Active Coping, Denial, Religious Coping, Humor, Behavioral Disengagement, Restraint, Use of Emotional Social Support, Substance Use, Acceptance, Suppression of Competing Activities, and Planning.

The COPE can be used in different formats. One is a ‘dispositional’ or trait-like version in which respondents report the extent to which they usually practice the strategies listed, when they are stressed. A second is a time-limited version in which respondents indicate the degree to which they have been employing each strategy during a particular period up to the present. In the current studies the time-limited version was used, as women were asked to indicate how often they used the strategies within the preceding month. This version was used given that one of the aims of the Study Three was to assess if use of coping strategies would change over time.

The COPE has been extensively used with a wide variety of populations, including perinatal women with strong reliability. In Study Three Cronbach’s alpha for internal consistency ranged from .72 to .83 for the Growth, .63 to .74 for the Disengagement, .77 to .88 for the Focus Venting, .78 to .86 for the Instrumental Social Support, .73 to .83 for the Active
Coping, .61 to .88 for the Denial, .94 to .97 for the Religion, .88 to .94 for the Humour, .63 to .81 for the Behavioural Disengagement, .71 to .81 for the Restraint, .80 to .89 for the Emotional Support, .63 to .94 for the Substance Use, .70 to .82 for the Acceptance, .64 to .75 for the Suppression, and .81 to .88 for the Planning subscale. In Study Four the Growth, Disengagement, Emotional Support, and Planning subscales were included; Cronbach’s alpha for internal consistency ranged from .67 to .83 for the Growth; .47 to .60 for the Disengagement, .84 to .89 for the Emotional Support, and .84 to .88 for the Planning subscale.

**Self-esteem.** The Rosenberg Self-Esteem Scale (RSE) assessed levels of self-esteem in Study Three (Rosenberg, 1965). The RSE is a 10-item self-report measure relating to overall feelings of self-worth and self-acceptance. The items are scored on a 4-point scale ranging from 0 (Strongly Agree) to 3 (Strongly Disagree), with higher scores indicating higher levels of self-esteem. The RSE has been extensively used, with strong psychometric properties and has demonstrated an alpha coefficient for internal consistency ranging from .67 to .83 and test-retest reliability ranging from .77 to .85 (McCarthy & Hoge, 1982; Shahani, Dipboye, & Phillips, 1990). In Study Four Cronbach’s alpha ranged from: .87 to .89.

**Marital/Relationship Quality.** The Dyadic Adjustment Scale (DAS: Spanier, 1976) was used to assess marital/relationship quality in Study Three. The DAS has 32 items which form the four subscales of Dyadic Satisfaction, Dyadic Consensus, Dyadic Cohesion and Affectional Expression. Higher scores are indicative of greater level of relationship satisfaction/adjustment. The DAS has been widely used in previous studies with a variety of couples, and has demonstrated strong internal consistency with an alpha coefficient for internal consistency of .96 for the complete scale (Spanier, 1976). Internal consistency for the individual subscales has also been showed to be strong, with Cronbach’s alpha of .94, .90, .81 and .73 for dyadic
satisfaction, dyadic consensus, dyadic cohesion and affectional expression respectively (Spanier, 1976; 1979; Spanier & Thompson, 1982). The Dyadic Satisfaction subscale was included in the final analyses in Study Four with Cronbach’s alpha for internal consistency ranging from .77 to .88.

Significant Life Events. The Life Experiences Survey (LES: Sarason, Johnson, & Siegel, 1978) was used to measure significant life events occurring in the preceding 12 months in Study Three. The LES includes 47 events that are frequently experienced by individuals in the general population and usually require a certain amount of adjustment (e.g., marriage, severe illness, job change). Respondents are asked to indicate whether the listed life events occurred during the previous 12 months and then rate their experience of each life event that has occurred on a 7-point scale ranging from -3 (extremely negative) to +3 (extremely positive). Individuals can also report up to two more events they felt were important. Every event that occurred is coded as one ‘life change unit’. These units are then summed to yield a total score of recent life events. Positive and negative events can be summed separately, as can be the total number of events. The LES has been used with a wide range of populations, including perinatal women, and has demonstrated sound psychometric properties, with test-retest reliability of .63 for the positive change score, .88 for the negative impact score, and .64 for the total score (Behnke & Eyler, 1997; Kreitler et al., 1995; Labonte & Paris, 1993).

Cognitive Appraisal. The Stress Appraisal Measure (SAM: Peacock & Wong, 1990) assessed women’s cognitive appraisal of their pregnancy and the postpartum period. The SAM consists of 28-items which are rated on a 5-point Likert type scale ranging from 1 (Not at All) to 5 (Extremely). Individuals rate how they feel about a specific stressful situation. In the current study women were asked to think about their pregnancy and their time since the birth as the
potentially stressful situations, during the antenatal and postnatal time-points respectively. The SAM is comprised of seven subscales intended to measure an individual’s appraisal of events. The three primary subscales are: Threat, Challenge and Centrality. The three secondary appraisal subscales measure the individual’s appraisal of available coping resources, namely: Controllable-by-self, Controllable-by-others, and Uncontrollable-by-anyone. Finally, a general subscale of Perceived Stressfulness is also obtained. The SAM has been used with a variety of populations, with strong psychometric properties and has demonstrated an alpha coefficient for internal consistency ranging from .75, .74 to .90 for the Threat, Challenge and Centrality subscales, and .87, .84, and .65 for the Controllable-by-self, Controllable-by-others, and Uncontrollable-by-anyone subscales respectively (Durak & Senol-Durak, 2013; Peacock & Wong, 1990).

In Study Four the Threat and Uncontrollable-by-anyone subscales were included. Cronbach’s alpha for internal consistency ranged from .72 to .83 for the Threat, and .63 to .77 for the Uncontrollable-by-anyone subscale.

Data Screening

Prior to any analyses being conducted, all data was screened for inaccuracies in data entry and missing values. A Missing Value Analysis was conducted which revealed that any missing data was missing completely at random (MCAR; p >.05) across the items and sample. In turn, in an effort to preserve statistical power, missing values were substituted with the mean score for the variable at that time-point (Tabachnick & Fidell, 2007). This was relevant to less than 5% of the data. All study variables were then screened for univariate and multivariate outliers. Visual inspection of box plots and histograms revealed the presence of extreme outliers on a number of variables. These raw scores were recorded to one unit score larger than or equal
to the next most extreme score in the distribution (Tabachnick & Fidell, 2007). Multivariate outliers were assessed by computation of Mahalanobis distance, which did not indicate the presence of any multivariate outliers.

Following screening for outliers, assumptions of normality were checked by inspecting skew and kurtosis values, frequency histograms, expected normality probability plots and detrended expected normal plots. Examination of skewness and kurtosis values revealed that three variables still exceeded the recommended values of 2.0 for skew and 4.0 for kurtosis (Tabachnick & Fidell, 2007), thus suggesting that the assumption of normality had been violated. In Study Two the skewed variables were: the DASS Anxiety and Stress subscales, the EPDS, the MSPSS, and the PSQI. In Study Three and Study Four, non-normality was evident in the DASS-Anxiety, the COPE – Religion and COPE – Substance Use subscales.

Prior to any analyses being conducted, the appropriate transformations were applied to these variables in order to address skewness. Square root transformations were applied to all of the variables, with the exception of the MSPSS where reflect and square root transformation were applied, and the COPE-Religion variable where LOG transformations were applied. Following these transformations, the variables were normally distributed.

The COPE-Substance Use subscale remained skewed even after all transformations were tested. Given that this variable assessed substance use in the current sample of perinatal women, the extreme skewness was not surprising. Nonetheless given that normality is a key assumption for the analyses to be conducted the COPE-Substance Use subscale was excluded from all analyses.

Study variables were further assessed for multicollinearity, linearity and singularity. Visual inspection of bivariate scatter plots supported the assumption of linearity.
Multicollinearity was assessed by examining the correlation matrix, which did not indicate the presence of multicollinearity between any of the variables. Tolerance and variance inflation factor (IVF) values were also assessed and were within acceptable ranges.

**Data Analysis**

*Study Two*: Changes in depression, anxiety and stress symptoms over time were assessed by three separate repeated measures Analyses of Variance (ANOVA’s), as reported on the EPDS and the DASS Anxiety and Stress subscales. Post hoc comparisons were conducted in order to identify at which time points the symptom levels significantly differed from one another. Prospective relationships between depression, anxiety and stress symptoms were also assessed using partial correlations. The first was a stability model, in which EPDS at each time point predicted EPDS at the subsequent time point, DASS-Anxiety at each time point predicted subsequent DASS-Anxiety, and DASS-Stress predicted subsequent DASS-Stress. The second model was of EPDS prospectively predicting DASS-Anxiety; EPDS at each time point was correlated with DASS-Anxiety at the next time point, when DASS-Anxiety at the earlier time point was partialled out. The third model was of DASS-Anxiety prospectively predicting EPDS; earlier DASS-Anxiety predicted later EPDS when earlier EPDS was controlled. The fourth model was of DASS-Stress prospectively predicting EPDS; earlier DASS-Stress predicted later EPDS, again when earlier EPDS was controlled. The fifth model was of EPDS prospectively predicting DASS-Stress; earlier EPDS predicted later DASS-Stress when earlier DASS-stress was partialled out. The sixth model was of DASS-Stress prospectively predicting DASS-Anxiety; earlier DASS-Stress predicted later DASS-Anxiety, when partialling out earlier DASS-Anxiety. The seventh model was of DASS-Anxiety prospectively predicting DASS-Stress; earlier DASS-Anxiety predicted later DASS-Stress,
when partiailling out earlier DASS-Stress. Finally, the models were then repeated controlling for the effects of sleep quality and social support at the earlier time point.

**Study Three:** Descriptive analyses were conducted to investigate which coping strategies were most often used by women at the first antenatal time-point (16wks gestation), and again at the first postnatal time-point (3 months PP). Means and standard deviations for each subscale of the PCI and COPE indicated how often women reported using each coping strategy in response to stressful events during the previous month.

The trajectory of coping strategies over time were examined by performing a series of repeated measures ANOVA’s, exploring changes in coping strategies used as reported on the PCI and COPE. The assumption of sphericity was not met, and in turn a Huynh-Feldt Epsilon adjustment was implemented for all ANOVA’s (Tabachnick & Fidell, 2007). Post hoc comparisons were conducted to assess differences between time-points, and all comparisons were conducted using a Bonferroni adjustment for multiple comparisons.

The prospective relationships between coping strategies and depression, anxiety and stress symptoms were also assessed via partial correlations. The first set of models were stability models, in which each PCI and COPE subscale at each time point predicted the respective PCI and COPE subscale at all subsequent time points (e.g., COPE-Growth at 16wks predicting COPE-Growth at 24wks, 32wks etc). Prospective models of coping strategies at early pregnancy (16 weeks gestation) predicting Depression, Anxiety and Stress levels at Late Pregnancy (32 weeks gestation), and Depression, Anxiety and Stress predicting concurrent coping strategies at Late Pregnancy (32 weeks gestation) were also conducted. Prospective relationships between the PCI and COPE coping strategies during late pregnancy (32 weeks) and distress symptoms during the early postpartum (3 months PP) were also assessed. Finally the relationships between
Depression, Anxiety and Stress and concurrent coping at 3 months postpartum were also examined.

**Study Four:** A total of nine separate hierarchical regressions were conducted in order to investigate which predictor variables would demonstrate a unique contribution to the prediction of depression, anxiety and stress at 32 weeks gestation, 3 months postpartum, and 12 months postpartum respectively. For the antenatal regression models (factors predicting distress at 32 weeks gestation) covariates (education level, family income and parity status/number of children) were entered in the first step of the regression (Step 1), the maternal psychological factors (initial levels of depression, anxiety and stress) were entered in the second step of the regression (Step 2), the psychosocial factors (self-esteem, social support, sleep quality, marital/relationship quality, total life events score), were entered in the third step of the regression (Step 3); finally in step 4 the key coping strategies (pregnancy-specific avoidance, use of emotional support, disengagement, planning and growth/positive reinterpretation), and cognitive appraisal measures (threat and uncontrollable-by-anyone appraisal) were entered to assess whether they would add any unique contribution, in regards to the outcome variables (later depression, anxiety and stress).

For the early postpartum regression models (factors predicting distress at 3 months postpartum) covariates (education level, family income and parity status/number of children) were again entered in the first step of the regression (Step 1). Previous levels of depression, anxiety and stress as at 32 weeks gestation were entered in Step 2, current levels of depression, anxiety and stress, along with self-esteem, social support, sleep quality, marital satisfaction and life events score were then entered in Step 3. In Step 4, the key coping strategies (pregnancy-specific avoidance, use of emotional support, disengagement, planning and growth/positive
reinterpretation), and cognitive appraisal measures (threat and uncontrollable appraisal) were entered, to assess whether they would add any unique contribution in regards to the outcome variables (later depression, anxiety and stress).

In the late postpartum regression models (12 months postpartum), distress levels for the relevant outcome variable at 3 months postpartum were entered in Step 1; current levels of depression, anxiety and stress were then entered in the Step 2. Current sleep quality, marital satisfaction and total life events score were entered in Step 3; and in Step 4, the key coping strategies (use of emotional support, disengagement, planning and growth/positive reinterpretation), and cognitive appraisal measures (threat and uncontrollable) were entered.
References:


Chapter 3

Study One: The Transition to Motherhood: Towards a Broader Understanding of Perinatal Distress

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¹ The references and formatting for this paper, which form Chapter 3 of this thesis, are presented in accordance with the requirements of the Journal of Women and Birth, in which this paper was published.
Abstract

Background: A substantial body of research has focused on maternal perinatal mood and wellbeing, with the focus predominantly being on depression, and to a lesser extent, anxiety. Perinatal maternal stress has also been investigated recently, but to a far lesser extent. The present paper questions whether the term ‘perinatal distress’ accurately captures the range of challenges experienced by women during the perinatal period, when the scope of ‘distress’ is limited to the experience of depression and anxiety alone.

Method: A review of the perinatal literature was conducted using several databases, to identify studies that have focused on the experience of stress as a distinct affective state in the perinatal period.

Findings: The findings of two recent studies which have employed a broader conceptualisation of perinatal distress to encompass the experience of stress as well as depression and anxiety are outlined. These recent studies have identified the experience of stress both in conjunction with and independent of depression and anxiety.

Conclusion: It is argued that future studies should investigate the concept of stress as a separate affective state throughout the perinatal period, in order to further assess how it differs from depression and/or anxiety. A more comprehensive understanding of women’s experiences during their transition to motherhood, and whether ‘stress’ plays a critical role in the development and maintenance of perinatal anxiety and/or depression is needed.

Key words: pregnancy, postpartum, perinatal, depression, anxiety, stress
1. Introduction

The perinatal period, which includes pregnancy and the first year post birth, is recognised as a period of major transition that can be exceedingly emotional\(^1\), and associated with considerable distress\(^2, 3\). Consequently, elevated symptoms of depression and anxiety are experienced by a substantial number of women during this time, with prevalence studies suggesting that perinatal depression affects approximately 10-25% of women\(^4-6\), and perinatal anxiety affecting approximately 25-45% of women\(^4-7\). Research has also demonstrated that depressive and anxiety symptoms are often co-morbid throughout the perinatal period\(^3, 8, 9\) and that an inter-relationship exists between the two. Furthermore, the negative consequences of depression and anxiety extend not only to the woman herself, but also her fetus, and baby\(^10-15\). Given these consequences, theoretical advances that will inform intervention strategies designed to prevent perinatal depression and anxiety are warranted.

Researchers to date have predominantly defined perinatal distress as the psychological disorders of depression and anxiety that occur both during pregnancy and post birth\(^1\). However, it is unclear if these two affective states alone comprehensively describe the broad range of negative emotional experiences that can occur during the transition to motherhood. In this paper we argue that maternal stress should be included in the definition of perinatal distress as a distinct affective state. The existing literature, albeit limited, that supports this premise is outlined. We also argue that further research is needed in order to assess whether maternal stress is part of a normal continuum associated with the range of physical, social, and emotional changes that accompany the transition to parenthood, or whether it is linked to a depressed mood state, or a precursor to clinical presentations. Figure 1 depicts a proposed continuum model whereby emotional health and adjustment during the perinatal period is conceptualized.
as ranging from ‘Excellent Adjustment’ characterized by the presence of minimal depression and anxiety symptoms, to ‘Poor Adjustment’, characterized by clinical levels of depression and anxiety symptoms, and clear impairment in functioning.

![Figure 1](image.png)

*Figure 1. Proposed emotional health continuum during the transition to parenthood*

Our aim is to provide new insights to inform the design of future perinatal distress research, in order to best guide primary prevention efforts in this area.

2. Is the experience of perinatal distress limited to depression and anxiety alone?

Postnatal depression is by far the most prevalent and researched postpartum mood disorder\(^{16,17}\), and was arguably the sole point of research focus for many years. More recently, prenatal depression has also been of particular interest, given that it has repeatedly been identified as a strong predictor of postnatal depression and appears to be more prevalent than depression post birth\(^{18,11}\). A further shift has also occurred in recent years, whereby pre- and postnatal anxiety have been of considerable interest, with prevalence rates surpassing those of depression\(^{4,5,7}\).
The findings of recent studies suggest that a cycle of co-morbidity may exist between depression and anxiety, whereby initial levels of depressive symptoms in pregnancy lead to higher levels of anxiety in late pregnancy, which in turn predict higher depressive symptoms in the postnatal period\textsuperscript{8,9}. Given these findings, it is crucial to keep working towards a better understanding of the mechanisms that underpin depression and anxiety in the context of the perinatal period, with the aim of reducing their incidence and subsequent effects.

The assumption, however, that maternal distress is limited to the experience of depression and anxiety alone may be impeding a more comprehensive and arguably more accurate understanding of the range of negative emotional experiences and challenges associated with the transition to motherhood. It is possible that, just as anxiety was largely overlooked until recently, other affective states or factors may be critical in the experience of perinatal distress. The experience of significant emotional stress for instance, over and above that of depression or anxiety, may help practitioners and clinicians to better understand what a mother means when she states she “does not feel like herself” or is “struggling to cope”, particularly in the presence of known psychosocial risk factors, such as a lack of social support\textsuperscript{18}. It also seems possible that a persistent feeling of being unable to cope may contribute to the development of depression and/or anxiety and may thus be just as clinically significant as depression and anxiety. Therefore, the inter-relationship between anxiety and depression noted above, as two psychological mood states, may also involve a third partner – maternal stress.

3. Maternal Stress as a discrete affective state

The term stress refers to a distinct negative emotional state that involves chronic arousal and impaired function\textsuperscript{19}, and is thus differentiated from the experience of depressed or anxious mood and affect. A review of the perinatal literature however, reveals that the terms stress,
distress and anxiety have often been used inter-changeably and with varying definitions. The terms stress and distress have been used to describe a range of experiences, including the presence of mood disturbances\(^{20}\), state anxiety\(^{21,22,23}\), general health\(^{22,24}\), and has even been operationalized as difficult infant temperament\(^{25}\), and marital dissatisfaction\(^{26,27}\).

Lovibond and Lovibond’s\(^{19}\) definition of stress, as a separate affective state, warrants further investigation given the inconsistent use of the term in previous research. This will allow one to assess whether incorporating emotional stress into an even broader definition of perinatal distress (i.e., conceptualized as the presence of depression and/or anxiety and/or stress) differs substantially from the experience of perinatal depression and anxiety alone\(^3\). In turn, this will also allow researchers and clinicians to evaluate whether this broader conceptualization offers a more accurate representation of women’s experiences during the transition to parenthood.

3.1. Search Method:

The search was conducted with the aim of identifying empirical studies which have investigated stress as a discrete affective state in the perinatal period. A search of the databases: PsychInfo, Medline, and Science Direct was conducted to identify studies published in English between 1998 and 2013. Results were limited to human studies with adult women (18 years+) with full-text access. The search terms used were: perinatal, antenatal, prenatal, postnatal, postpartum, maternal, pregnancy, stress, distress.

This initial search generated 326 papers. Studies were then excluded if women were not recruited during the perinatal period; if they focused on particular sub-groups of women (e.g., those with a specific medical or mental illness, or who had experienced a traumatic event such as a natural disaster); or if they focused specifically on post-traumatic stress disorder. This
resulted in 59 papers. If the papers were review papers or related solely to the validation of a scale, or if they did not assess stress as an outcome variable they were then also excluded. Papers were then further excluded if they only explored maternal stress in the context of physical health, social factors or parenting stress alone (i.e., mental health was not explored). This search revealed that only one paper (Miller et al, 2006) operationalized stress as a distinct affective state as per Lovibond and Lovibond’s definition, separate from the presentation of depression and/or anxiety. The authors are aware of one other relevant study that was not identified in the search above (Rallis, 2008). To our knowledge, the affective state of stress as defined earlier, has only been investigated in these two recent investigations3, 28. These studies explored the trajectory of stress symptoms during the postpartum period as part of a broader definition of distress.

4. Previous research investigating Perinatal Stress and Perinatal Distress.

Miller et al.3 proposed a classification for postnatal distress, which included symptoms of anxiety, stress, as well as depression. Symptom levels were assessed in first-time mothers by the Edinburgh Postnatal Depression Scale and the 21-item Depression Anxiety Stress Scale. Results revealed that the EPDS identified 80 women (25% of the total sample) as likely depressed, whereas the DASS-21 classified 61 women in total (19%) as depressed. Implementing broader criteria for distress, the DASS-21 classified a further 33 women (10%) as anxious and stressed without depression, clearly highlighting the fact that if the EPDS was used as the sole measure in this study, these 33 women would not have been detected. Furthermore, a total of 41 women (13%) were classified as anxious either independently (n=18; 6%), or in combination with depression with 23 women (7%) identified as both anxious and depressed (anxious-depressed).
By applying this broader conceptualization of postnatal distress, where anxiety and stress were also included, Miller et al. demonstrated that 94 women (29% of the total sample) had at least one classification of depression, anxiety or stress, in the mild, moderate, severe or extremely severe categories on the DASS-21. Their findings support those reported by Matthey et al.\textsuperscript{29}, where anxious mothers without depression were also identified.

Extending the findings of Miller et al.’s\textsuperscript{3} study, Rallis\textsuperscript{28} sought to attain a comprehensive trajectory of postpartum distress, by assessing symptoms of depression, anxiety, and stress across the first 12 months postpartum. In addition, the broader classification and identification of ‘distressed’ women was also explored by identifying women as anxious and stressed both in conjunction with and in the absence of depression. Sixty women completed the EPDS and the DASS-21 on a monthly basis, commencing at 6 weeks postpartum and ceasing at 52 weeks postpartum. Significant differences across time were demonstrated for depression, anxiety, as well as stress levels, with results indicating that distress levels peaked at 6-8 weeks, 22-28 weeks and 42-44 weeks postpartum. Cases of recurring distress were also revealed; women often reported experiencing elevated distress symptoms, followed by a period of diminution, followed by a subsequent recurrence of distress symptoms.

When investigating the broader classification of distress, Rallis (2008) found women to be anxious and stressed both in conjunction with (22%) and independent of depression (10%). In turn, Rallis proposed that the results indicate that a broader classification of distress is indeed warranted, rather than depression alone. Rallis argued that there is a need to monitor and assess women’s overall distress levels, including symptoms of depression, anxiety, and stress across the entire first postpartum year and not just the initial few months post birth, in order to best capture the range of emotional experiences occurring at this time. Rallis also reasoned that the
DASS-21 may be a particularly useful tool when initially screening for maternal distress, given that it allows for symptoms of depression, anxiety, and stress to be assessed within the one brief measure.

5. Implications for future research

Given that distress symptoms appear to be present throughout the entire first postpartum year for some women\textsuperscript{28}, it is possible that a similar pattern may also exist for stress symptoms across pregnancy. Further research is thus needed to investigate the changing course of maternal stress, and the factors which may be impacting its course, across the entire perinatal period. To our knowledge the point prevalence of stress (i.e., the percentage of women experiencing stress at particular time-points), with a validated measure that differentiates stress from anxiety and depression during pregnancy, has not been investigated; neither have the antecedents and consequences of maternal stress during the perinatal period.

Understanding how the experience of perinatal stress differs from that of perinatal depression and/or anxiety, and knowing the precursors and effects of stress during the perinatal period has clinical implications. For example, if the affective state of stress is shown to correspond closely to one’s sense of feeling overwhelmed or an inability to cope, it may be that this experience is a significant precursor of depression and anxiety. If this is the case, treating this stress in the context of clinical depression and/or anxiety is likely to require specialized assessment and treatment planning, just as co-morbid depression and anxiety require different treatment strategies from the treatment of depression or anxiety alone\textsuperscript{30}. Thus, the presence of significant stress may have significant implications for the strategies adopted by health professionals and for the resources necessary to support the treatment of this condition. Alternatively, if this stress is part of a normative continuum related to the transition to
motherhood, promoting access to various psychosocial supports, such as increased partner and family support, may provide the best outcome rather than clinical treatment.

6. Conclusion

In this paper we put forward the argument that the concept of perinatal distress may provide a better representation of women's experiences during the transition to motherhood if the scope is extended beyond that of depression and anxiety alone. Specifically, we propose that the concept of maternal stress as a distinct affective state may allow for a more comprehensive understanding into the range of negative emotional experiences associated with the perinatal period.

Preliminary findings from recent studies indicate that there are likely to be several interacting mechanisms that are yet to be fully understood, such as whether a cycle of co-morbidity exists for stress and depression and/or stress and anxiety, and the role of known psychosocial risk factors. Prospective studies which assess maternal distress symptoms across pregnancy and the first postnatal year, and which employ clear and consistent definitions are needed in order to attain a better understanding of the nature and changing course of distress symptoms across the whole perinatal period, as well as the factors that may contribute to the onset, maintenance and/or recurrence of maternal distress symptoms.

Pregnancy and the postnatal period provide a unique opportunity to screen and assess for distress due to the regular contact that women have with obstetricians, midwives, and other health professionals during these times. Hence, developing a screening and treatment model that will alleviate the negative outcomes associated with maternal distress during the perinatal period is certainly warranted.
Acknowledgments:

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References


Chapter 4

Study Two: A Prospective Examination of Depression, Anxiety and Stress throughout Pregnancy

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¹ The references and formatting for this paper, which form Chapter 4 of this thesis, are presented in accordance with the requirements of the Journal of Women and Birth, in which this paper was published.
Abstract

Background: Perinatal distress has largely been conceptualised as the experience of depression and/or anxiety. Recent research has shown that the affective state of stress is also present during the perinatal period and thus may add to a broader understanding of perinatal distress.

Aim: The aims of the present study were to investigate the changes in depression, anxiety and stress symptoms on a monthly basis across pregnancy, and to explore the prospective relationships between these symptoms.

Methods: Two-hundred and fourteen pregnant women were recruited when they were less than 16 weeks gestation. Women completed depression, anxiety and stress measures on a monthly basis, from 16 weeks gestation through to 36 weeks gestation. The covariate measures of sleep quality and social support were assessed bi-monthly at 16, 24 and 32 weeks gestation.

Findings: Levels of depression, anxiety and stress symptoms were all shown to change over time, with women experiencing fewer symptoms during the middle of their pregnancy. Higher symptoms early in pregnancy predicted higher symptom levels throughout the rest of pregnancy. Higher depression scores early in pregnancy were also shown to predict higher anxiety and higher stress scores in late pregnancy. Increased stress scores during mid pregnancy also predicted higher anxiety scores in late pregnancy.

Conclusion: Current findings indicate that symptom levels of depression, anxiety and stress vary over the course of pregnancy. Increased depression in early pregnancy seemed to be particularly pertinent as it not only predicted later depression symptoms, but also increased anxiety and stress in late pregnancy. Collectively, these results highlight the importance of emotional health screening early in pregnancy.

Key words: pregnancy, depression, anxiety, stress, sleep quality, social support
Introduction

The perinatal period is recognised as a time of major transition that can be extremely emotional (1), and associated with significant distress (2, 3). Symptoms of emotional distress are experienced by a substantial number of women, with international research indicating that depression affects approximately 10-25% of women, while anxiety affects approximately 25-45% of perinatal women (4, 5). The negative consequences of perinatal distress have been well documented and extend not only to the new mother, but also her foetus, child, partner and family (e.g., 6-11). In turn, there is a clear need to continuously advance our understanding of perinatal distress in an effort to better inform screening, prevention and early detection practices, as well as treatment strategies.

Research to date has primarily defined perinatal distress as the psychological disorders of depression and anxiety (1), which in turn are the two affective states that have received the most research attention. Interestingly, despite this attention and the increased contact that women generally have with health professionals during pregnancy and post birth (in comparison to other time points in their lives), depression and anxiety can often be overlooked and thus left untreated, with approximately half of all cases going unrecognised (12). Perhaps even more neglected, are the early signs of elevated distress levels as well as subclinical symptom levels. In addition, relatively little attention has focused on exploring whether these experiences represent a continuum of symptoms that women may experience prior to the onset of clinical depression. This is especially surprising given that depressive symptoms and anxious features are often identified as risk factors and precursors to postpartum depression (13).
Furthermore, when reviewing the literature on the prevalence of perinatal distress, a notable deficit is highlighted in that most prospective studies to date have assessed distress symptoms at only two to three time-points (e.g., 14-17) with only a few assessing symptoms across four (e.g., 7, 18) or five time-points (e.g., 19, 20). The majority of these studies have also been focused on the postpartum period, rather than pregnancy. Clearly, such research designs do not allow one to assess which distress symptoms demonstrate the earliest onset; what the specific time points are in which the symptoms are escalating; and ultimately at what time-points health professionals may consider intervening in an effort to deliver the most effective treatment plan.

Research has also shown that anxiety symptoms may be more common in perinatal depression in comparison to non-perinatal depression (15, 21). In light of these findings, it has been argued that there is a need to abandon dichotomous classification systems and to discriminate other affective states in the perinatal period, such as perinatal stress (22, 23); which has been shown to be present during the first postpartum year and thus may add to the broader and better understanding of perinatal distress (3).

Lovibond and Lovibond (24) assessed and defined the construct of stress as a measure of persistent, non-specific arousal and tension, with a low threshold for becoming frustrated or upset (24, 25). It is argued that while some symptoms of stress are associated closely with those of anxiety, the experience of stress as a whole entails a coherent set of symptoms that can be differentiated from depression and anxiety. Thus, the existence of such symptoms as a collective may have important implications for any effort to provide a comprehensive understanding of negative affective states (24, 25), and may also be a term that is more readily accepted and associated with less stigma by the wider community. To our
knowledge, the point prevalence of stress, with a validated measure that differentiates stress from anxiety and depression during pregnancy, has not been investigated. Past research has indicated that multi-dimensional screening tools such as the Depression Anxiety and Stress Scales (DASS) may be particularly useful, as they allow clinicians to screen for not only depression, as is the case with commonly used instruments such as the Edinburgh Postnatal Depression Scale (26), but also anxiety and stress symptoms within the one brief measure (3).

The findings of recent studies also indicate that a cycle of co-morbidity exists between depression and anxiety, whereby initial levels of depressive symptoms in pregnancy lead to higher levels of anxiety in late pregnancy, which in turn predict higher depressive symptoms in the postnatal period (27,28). A better understanding of these relationships may elucidate the mechanisms that underpin depression and anxiety in the perinatal period. In turn, this understanding may assist in designing interventions to reduce their incidence, subsequent effects and treatment costs. Whether a similar cycle of co-morbidity exists between stress and depression, and stress and anxiety has not been explored to date.

The overall aim of this study was twofold: (1) to examine the trajectory of depression, anxiety and stress symptoms throughout pregnancy on a monthly basis; and (2) to investigate the prospective relationships between depression, anxiety and stress through pregnancy. The impact of social support and sleep quality during early, mid and late pregnancy, were co-varied in the later analyses, given that they have been shown to be associated with depressive symptoms during the antenatal period (29-31).
Method

Participants

Two hundred and fourteen women were recruited as part of a prospective study. The women were recruited at 10-16 weeks gestation via pregnancy and birth magazines, online forums for expectant and new parents, as well as via word of mouth and community advertising, from various states of Australia. Characteristics of the participant sample are shown in Table 1 below.

Table 1

| Participant Characteristics at Initial Study Time-Point (16 weeks gestation); n=214 |
|-------------------------------------|------------------|
| Age, M (SD) | 30.67 (4.29) |
| Range | 19-44 years |
| Relationship Status n (%) |  |
| Married | 161 (75.2%) |
| De Facto | 49 (23.0%) |
| Single | 3 (1.4%) |
| Did not respond | 1 (0.4%) |
| Parity Status n (%) |  |
| Primiparous | 122 (57%) |
| Multiparous | 92 (43%) |
| Born in Australia n (%) | 180 (84.1%) |
| Education, n (%) |  |
| Did not complete high school | 6 (2.8%) |
| Completed high school | 19 (8.9%) |
| Diploma/Certificate Level | 60 (28%) |
| Bachelor Degree | 93 (43.5%) |
| Postgraduate Degree | 36 (16.8%) |
| Engaged in paid employment n (%) |  |
| Working full-time | 105 (49%) |
| Annual Family Income Bracket ($AUD) n (%) |  |
| $105,001 or more | 136 (63.9%) |
| $65,001-105,000 | 51 (23.9%) |
| $65,000 or less | 26 (11.8%) |
| Did not respond | 1 (0.4%) |
**Measures**

*Demographics Questionnaire.* The Demographics Questionnaire obtained information regarding age, weight, annual household income, parity status, employment and marital status, as well as information regarding current health and exercise behaviours.

*Perinatal Anxiety and Stress.* Perinatal anxiety and stress were assessed using the Anxiety and Stress subscales from the Depression, Anxiety and Stress Scales – short form (24). The DASS-21 is a self-report scale with 7 items in each category of Depression, Anxiety and Stress symptoms, thus the 7 anxiety and 7 stress items were used in the present study. Responses are scored on a 4-point Likert scale ranging from 0 to 3, with elevated scores indicating higher levels of anxiety and stress.

The DASS-21 is a widely used, standardised instrument found to reliably distinguish between the symptoms of depression, anxiety and stress in clinical as well as non-clinical samples (32,33), and has demonstrated strong reliability and validity with Cronbach’s alpha .87 and .91 for anxiety and stress respectively (34). In the current study alpha coefficients ranged from: .64 to .74 for the Anxiety subscale, and .75 to .83 for the Stress subscale.

*Perinatal Depression.* The Edinburgh Postnatal Depression Scale was used to assess the levels of depressive symptomatology (26). The EPDS is a 10-item self report scale which assesses depressive symptoms experienced within the previous week. Responses to statements are scored on a 4-point Likert scale ranging from 0 to 3, with higher scores indicative of greater intensity of depressive symptoms. The EPDS was initially developed for use with postnatal women and later validated for use with antenatal women also (35), and has been extensively used with sensitivity levels of .86, specificity levels of .76 and strong
reliability with Cronbach’s alpha .87 (26). In the present study Cronbach’s alpha for internal consistency ranged from .76 to .83.

Social Support. The Multidimensional Scale of Perceived Social Support was used to assess social support (36). The MSPSS is a 12-item scale which assesses social support from family, friends and significant others. Responses to statements are scored on a 7-point Likert scale ranging from 1 to 7, with higher scores indicative of greater social support. The MSPSS has been extensively used across various countries and settings, including obstetric populations demonstrating strong reliability with Cronbach’s alpha .90 (28). In the present study Cronbach’s alpha for internal consistency ranged from .90 to .92.

Sleep Quality. The Pittsburgh Sleep Quality Index was used to assess sleep quality (37). The PSQI is a 18-item self report scale which assesses subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction which in turn yield a global sleep quality score. Responses to statements are scored on a 4-point Likert scale ranging from 0 to 3, with global scores of 5 or greater indicative of “poorer” sleep quality. The PSQI has been used across numerous settings, including perinatal populations, and has demonstrated good reliability with Cronbach’s alpha .71, .78 (27, 28). In the present study Cronbach’s alpha for internal consistency ranged from .69 to .71.

Procedure

Following university ethics approval and written informed consent from participants, women were mailed the questionnaire packs, with reply paid envelopes. Questionnaires were sent on a monthly basis, commencing at 16 weeks gestation through to 36 weeks gestation. Participants completed the Anxiety and Stress subscales from the
DASS-21 and EPDS on a monthly basis, while the MSPSS and the PSQI were completed every eight weeks, at 16, 24 and 32 weeks gestation. In regards to attrition, 276 women completed the initial questionnaire (at 16 weeks gestation), of whom 214 (77.5%) completed all time points and were included in the current analyses. Mean depressive, anxiety and stress scores at 16 weeks gestation did not differ for the women included in the current study, and those not included (n=62; p>.05).

Findings

Data Analysis

The results reported from this point forward are based on the six time-points as follows: Time 1 (T1): 16 weeks gestation (M = 16.59 weeks, SD = 0.94); Time 2 (T2): 20 weeks gestation (M = 20.63 weeks, SD = 0.99); Time 3 (T3): 24 weeks gestation (M = 24.46 weeks, SD = 0.86); Time 4 (T4): 28 weeks gestation (M = 28.34 weeks, SD = 0.85); Time 5 (T5): 32 weeks gestation (M = 32.66 weeks, SD = 0.85); Time 6 (T6): 36 weeks gestation (M = 36.50 weeks, SD = 0.75).

Prior to any analyses being conducted, the appropriate transformations were applied to both DASS subscales, the EPDS, the MSPSS at all time-points and the PSQI at T1 in order to address skewness. Square root transformations were applied to all the above mentioned variables, with the exception of the MSPSS where reflect and square root transformation were applied. Following these transformations, all variables were normally distributed. Transformed variables were included in all relevant analyses; however the means and standard deviations reported throughout the paper are based on the original non-transformed variables. In order to assess changes over time, three repeated measures
ANOVA’s were performed, exploring changes in depressive, anxious and stress symptoms as reported on the EPDS and the DASS Anxiety and Stress subscales.

**EPDS Mood Changes across Pregnancy**

Due to the assumption of sphericity being violated within the repeated measures ANOVA a Huynh-Feldt Epsilon adjustment was implemented (38). A significant effect for Time was found $F(4.78, 1.02E) = 8.62, p = .000 \eta^2 = .039$. Least Significant Differences (LSD) post hoc comparisons revealed numerous differences between means across the time points. These mean differences are presented in Table 2 along with the original means and standard deviations.

Table 2

**EPDS Post-Hoc Comparisons Assessing Mean Differences Between the Study Time Points.**

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<tbody>
<tr>
<td>1 EPDS- T1</td>
<td>-</td>
<td>.13*</td>
<td>.14*</td>
<td>.26*</td>
<td>-.01</td>
<td>-.06</td>
</tr>
<tr>
<td>2 EPDS- T2</td>
<td>-</td>
<td>-</td>
<td>.01</td>
<td>-.13*</td>
<td>-.15*</td>
<td>-.20*</td>
</tr>
<tr>
<td>3 EPDS- T3</td>
<td>-</td>
<td>-</td>
<td>.13*</td>
<td>-.15*</td>
<td>-.20*</td>
<td></td>
</tr>
<tr>
<td>4 EPDS- T4</td>
<td>-</td>
<td>-</td>
<td>.28*</td>
<td>-.33*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 EPDS- T5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 EPDS- T6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</table>

| M    | 4.91 | 4.48 | 4.48 | 4.18 | 5.35 | 5.30 |
| SD   | 3.59 | 3.41 | 3.55 | 3.49 | 3.99 | 3.40 |

*Note: EPDS – Edinburgh Postnatal Depression Scale; T1 – Time 1; T2 – Time 2; T3 – Time 3; T4 – Time 4; T5 – Time 5; T6 – Time 6; Cases were excluded pairwise and analyses were performed on transformed variables; n=214;

* Difference is significant at the 0.05 level

As can be seen from Table 2, a number of significant differences between time points were evident for EPDS scores, with most differences evident when comparing scores
at Time 4, to the other time points. Depressive symptoms were at their lowest levels at
Time 4 (28 weeks gestation) with significant differences noted in the comparisons to all the
other time points. Depressive symptoms appeared to be heightened during Time 1, Time 5
and Time 6 with scores significantly higher than those at Time 2, Time 3 and Time 4.

DASS - Anxiety Changes Across Pregnancy

When exploring the changes in the DASS-Anxiety scores across time the assumption
of sphericity was violated, thus a Huynh-Feldt Epsilon adjustment was again implemented.
A significant effect for Time was found $F(4.64, 989.04) = 9.13, p = .000, \eta^2 = .041$. Least
Significant Differences (LSD) post hoc comparisons revealed numerous differences across
the time points. These differences are presented in Table 3 along with the original means
and standard deviations.

Table 3

<table>
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<tbody>
<tr>
<td>1 DASS-Anx1</td>
<td>-</td>
<td>.19*</td>
<td>.28*</td>
<td>.29*</td>
<td>.08</td>
<td>-.16</td>
</tr>
<tr>
<td>2 DASS-Anx2</td>
<td>-</td>
<td>.09</td>
<td>.10</td>
<td>-.11</td>
<td>-.35*</td>
<td></td>
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<tr>
<td>3 DASS-Anx3</td>
<td>-</td>
<td>.01</td>
<td>-.20*</td>
<td>-.44*</td>
<td></td>
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<tr>
<td>4 DASS-Anx4</td>
<td>-</td>
<td></td>
<td>-.21*</td>
<td>-.45*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 DASS-Anx5</td>
<td>-</td>
<td></td>
<td></td>
<td>-.24*</td>
<td></td>
<td></td>
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<tr>
<td>6 DASS-Anx6</td>
<td>-</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mean</td>
<td>3.90</td>
<td>3.11</td>
<td>3.02</td>
<td>2.89</td>
<td>3.56</td>
<td>4.25</td>
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<tr>
<td>SD</td>
<td>4.52</td>
<td>3.89</td>
<td>4.09</td>
<td>3.66</td>
<td>4.05</td>
<td>4.27</td>
</tr>
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</table>

Note: DASS-Anx – Depression Anxiety Stress Scales Anxiety Subscale; 1 – Time 1; 2 – Time 2;
3 – Time 3; 4 – Time 4; 5 – Time 5; 6 – Time 6; Cases were excluded pairwise and analyses were
performed on transformed variables; n=214;
* Difference is significant at the 0.05 level
As can be seen from Table 3, numerous differences between mean anxiety scores were revealed over time, with the majority of differences noted at Time 1, Time 5 and Time 6. While anxiety scores at all three of these time points were elevated, symptoms at Time 6 were particularly heightened, with anxiety levels at Time 6 (36 weeks gestation) being significantly higher than four out of the five other time points. Anxiety symptoms at were at their lowest at Time 4, with mean anxiety scores being significantly lower than those at Time 1, Time 5 and Time 6.

DASS - Stress Changes Across Pregnancy

When investigating the differences across the time points for DASS-Stress scores the assumption of sphericity was violated, thus a Huynh-Feldt Epsilon adjustment was implemented. A significant effect for Time was found $F(4.82, 1.03E) = 6.61, p = .000, \eta^2 = .030$. Least Significant Differences (LSD) post hoc comparisons revealed numerous differences between mean scores across the time points. These differences are presented in Table 4 along with the original means and standard deviations.
Table 4

*DASS-Stress Post-Hoc Comparisons Assessing Mean Differences Between Study Time Points.*

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<tr>
<td>1 DASS-Stre1</td>
<td>-</td>
<td>.04</td>
<td>.12</td>
<td>.39*</td>
<td>.12</td>
<td>.11</td>
</tr>
<tr>
<td>2 DASS-Stre2</td>
<td>-</td>
<td>.09</td>
<td>.35*</td>
<td>.08</td>
<td>.07</td>
<td></td>
</tr>
<tr>
<td>3 DASS-Stre3</td>
<td>-</td>
<td>.26*</td>
<td>-.00</td>
<td>-.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 DASS-Stre4</td>
<td>-</td>
<td>-.27*</td>
<td>-.28*</td>
<td></td>
<td></td>
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<tr>
<td>5 DASS-Stre5</td>
<td>-</td>
<td>-.01</td>
<td></td>
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<td></td>
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<tr>
<td>6 DASS-Stre6</td>
<td>-</td>
<td>-</td>
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</table>

Mean | 9.43 | 9.26 | 8.93 | 7.60 | 9.07 | 9.02 |
SD   | 5.93 | 5.65 | 5.68 | 5.33 | 6.20 | 5.83 |

*Note:* DASS-Stre – Depression Anxiety Stress Scales Stress Subscale; 1 – Time 1; 2 – Time 2; 3 – Time 3; 4 – Time 4; 5 – Time 5; 6 – Time 6; Cases were excluded pairwise and analyses were performed on transformed variables; n=214.

* Difference is significant at the 0.05 level

The results summarised in Table 4 illustrate that once again differences between scores for each time point were evident for DASS-Stress scores, with higher scores noted at Time 1, Time 2, Time 5 and Time 6. Time 4 was again found to be a period of time where stress symptoms significantly decreased, with mean stress scores being at their lowest point at Time 4 (28 weeks gestation), and significant differences emerging for stress scores at Time 4 in comparison to all the other five time-points.

Figure 1 displays graphically the change in mean scores of the EPDS and the two subscales of the DASS across the pregnancy time-points. It is important to note that the scoring range for each measure is different; hence the symptom levels of one subscale...
cannot be directly compared to another. In turn it is the trajectory that is of interest, and
the trends demonstrated in terms of when symptoms peaked and dropped.

![Figure 1. Changes in EPDS and DASS subscale scores across the study time points.](image-url)

It should be noted that the results reveal a relatively well functioning sample,
with mean scores for the DASS subscales being in line with normative data available
from Australian samples (Normative means and standard deviations in brackets of 4.7
(4.91), and 10.11 (7.91) for the anxiety and stress scales, respectively (13).

Prospective relationships between depression, anxiety and stress symptoms

Table 5 presents the intercorrelations among the study variables included in the
prospective analyses.
### Table 5

**Correlation Matrix for Study Variables in the Prospective Analyses**

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<th>9</th>
<th>10</th>
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** Correlation is significant at the 0.01 level; * Correlation is significant at the 0.05 level

**Note:** EPDS – Edinburgh Postnatal Depression Scale; DASS:Anx – Depression, Anxiety and Stress Scale: Anxiety Subscale; DASS:Stre – Depression, Anxiety and Stress Scale: Stress Subscale; T1 – Time 1 (16 weeks); T3 – Time 3 (24 weeks); T5 – Time 5 (32 weeks); Cases were excluded pairwise and correlations were performed on transformed variables; n=214.

Seven prospective models of the EPDS, DASS Anxiety (DASS-Anx) and DASS Stress (DASS-Stress) were also assessed. The first was a stability model, in which EPDS at each time point predicted EPDS at the subsequent time point, DASS-Anx at each time point predicted subsequent DASS-Anx, and DASS-Stress predicted subsequent DASS-Stress. The second model was of EPDS prospectively predicting DASS-Anx; EPDS at each time point was correlated with DASS-Anx at the next time point, when DASS-Anx at the earlier time point was partialled out. The third model was of DASS-Anx prospectively predicting EPDS; earlier DASS-Anx predicted later EPDS when earlier EPDS was controlled. The fourth model was of DASS-Stress prospectively predicting EPDS; earlier DASS-Stress predicted later EPDS, again
when earlier EPDS was controlled. The fifth model was of EPDS prospectively predicting DASS-Stress; earlier EPDS predicted later DASS-Stress when earlier DASS-stress was partialled out. The sixth model was of DASS-Stress prospectively predicting DASS-Anx; earlier DASS-Stress predicted later DASS-Anx, when partialling out earlier DASS-Anx. The seventh model was of DASS-Anx prospectively predicting DASS-Stress; earlier DASS-Anx predicted later DASS-Stress, when partialling out earlier DASS-Stress. Finally, analyses were then repeated controlling for the effect of sleep quality and social support at the earlier time point given their association with antenatal depressive symptoms in previous studies (29-31).

Figure 2 shows the results of the model testing, which supports a stability model for depressive symptoms (EPDS), anxiety symptoms (DASS-Anx) as well as stress symptoms (DASS-Stress) over time across pregnancy. Furthermore, higher EPDS scores at 24 weeks gestation also predicted increases in DASS-Anx scores at 32 weeks gestation, and higher DASS-Stress scores at 24 weeks gestation predicted increases in EPDS scores at 32 weeks gestation, although not when social support and sleep quality were controlled for.

Higher EPDS scores at 16 weeks gestation predicted increases in DASS-Anx as well as DASS-Stress scores at 32 weeks gestation, and these relationships remained significant even after social support and sleep quality were controlled for. Higher DASS-Stress scores at 24 weeks gestation also predicted increases in DASS-Anxiety scores at 32 weeks gestation, and this relationship remained significant even after social support and sleep quality were controlled.
Figure 2. Partial correlations between EPDS, DASS-Anx and DASS-Stress at 16 weeks, 24 weeks and 32 weeks gestation, after controlling for EPDS, DASS-Anx and DASS-Stress at the prior time point (in italics), and also after controlling for perceived social support ad sleep quality at the earlier time point (in bold); * p<.05; ** p<.001; solid paths were significant, dashed paths were non-significant, round dotted paths were non-significant after controlling for perceived social support, and sleep quality at the earlier time point.
Discussion

The first aim of this study was to attain a comprehensive trajectory of antenatal distress, by exploring levels of depression, anxiety and stress throughout pregnancy. Significant differences were demonstrated in distress levels across time for depression, anxiety as well as stress levels. Results revealed that women’s distress symptoms were relatively elevated at 16 weeks gestation, and then again later in pregnancy at 32 and 36 weeks gestation. Thus, symptoms appeared to decrease during the middle of pregnancy (at approximately 24 and 28 weeks gestation) before increasing again towards late pregnancy. Given that a potential confound may have been women’s parity status mean depressive, anxiety and stress scores for primiparous women were compared to those of multiparous women at the first (16 weeks gestation) and last (36 weeks gestation) study time points. No significant differences were revealed between the two groups for any of the distress symptoms, (p>.05). These findings indicate that women were feeling increasingly distressed up until the 16 week gestation mark, regardless of whether they were first-time mothers or not, possibly due to a number of factors such as risk of miscarriage, morning sickness, and overall adjusting to the physical, hormonal and emotional changes associated with pregnancy. The increase in symptoms later on in pregnancy (32 weeks onwards) may be due to increased physical discomfort, increased anxiety due to the upcoming labour and birth process, and adjusting to the realization that parenthood, and all the stressors and changes in life associated with it, is imminent. The fact that parity status did not account for any increased symptoms may also indicate that while the stressors faced by first-time mothers may be different to those who already have other children (e.g., feeling unsure about how one will cope with the
transition to parenthood or lacking confidence at responding to a newborn baby’s cues as opposed to feeling confident in responding to the baby but having to also attend to and care for other children), there are various stressors that are relevant in each set of circumstances. Given that early increases of depression, anxiety and stress may be indicative of growing distress, monitoring and discussing emotional wellbeing of women throughout the antenatal period by health professionals is important as distress symptoms will not necessarily be heightened across the entire gestational period, but rather ‘peak’ at certain periods.

The second aim of this study was to investigate the inter-relationships between depression, anxiety and stress across pregnancy, as well as the influence of perceived social support and sleep quality. Results showed that depressive, anxiety and stress symptoms demonstrated strong stability over time with earlier depression symptoms predicting higher depression symptoms at all later time points. This pattern was also replicated with the anxiety symptoms and is in accordance with results obtained by previous studies (13,15,16). Stress symptoms also demonstrated the same pattern, and to our knowledge this is the first time that stress symptoms have been prospectively explored in this manner.

Elevated depression scores at 24 weeks gestation also predicted increases in anxiety scores later in pregnancy, and higher stress scores at 24 weeks predicted higher depression scores later in pregnancy, although not when social support and sleep quality were controlled for. Interestingly, higher depression scores early in pregnancy (16 weeks gestation) predicted higher anxiety scores later in pregnancy (32 weeks gestation), a relationship that remained significant even after social support and sleep quality were
controlled for. These results are similar to those obtained by Skouteris et al. (2009) who found that depressive symptoms earlier in pregnancy predicted higher levels of anxiety later in pregnancy. Similar patterns also emerged for stress scores, with higher depression scores early in pregnancy predicting increases in late pregnancy stress symptoms, and increased stress scores during mid pregnancy (24 weeks gestation) predicted increased anxiety scores in late pregnancy. Both these relationships remained significant after the effects of social support and sleep quality had been accounted for. Given that this is the first study to explore the prospective interrelationship of stress symptoms, future research investigating the importance of stress symptoms and how their impact may differ from that of depressive and anxiety symptoms would be useful.

Conclusion

Depression screening in early pregnancy appears to be particularly pertinent, as it can not only predict later depression, anxiety and stress symptoms as shown in the current study (even after accounting for the effects of social support and sleep quality), but has been shown to predict depression post-birth (27, 28), thus lending further support to the importance of continued depression screening. While the majority of women in the current sample were not experiencing clinical levels of depression, the current findings highlight the need for clinicians involved in the care of perinatal women to assess for distress symptoms in early pregnancy due to their significance in predicting mood and distress throughout pregnancy; and to also design and modify intervention programs to include the experience of anxiety and stress symptoms in an effort to maximize the effectiveness. Replication of this study design with a clinical sample (e.g., with women who meet criteria for a clinical diagnosis of a depressive and/or anxiety
disorder) would also help clarify the clinical significance of the present findings. A wider psychosocial assessment that explores the experience of other key factors that may be impacting on the mechanisms underlying the development and maintenance of distress is also warranted.

Limitations of this study include the fact that data was collected via self-report, as well as the fact that the current sample may not be representative of the wider community, given that the majority of the participants were married, tertiary educated women from higher socio-economic status, thus limiting the generalisability of the current findings. Furthermore, the scope of this study did not extend to any additional contributing factors that may be important in better understanding how and when elevated distress symptoms occur during the perinatal period. Future research is needed to investigate this further, while also extending the current investigation to include the postpartum period with a more diverse sample.

Despite these limitations, the present findings show that early depressive, anxiety and stress symptoms predict later symptoms, and that early depressive symptoms may predict not only higher depressive symptoms later in pregnancy, but also higher anxiety and stress. If this result is replicated consistently in future research, it may allow health professionals who screen and assess women at early pregnancy to not only identify women who are at increased risk of emotional distress later on in pregnancy, but may also allow for early intervention that targets depressive, anxiety and stress symptoms.

Acknowledgements:

We extend our thanks and appreciation to the women who participated in this research.
References:


Chapter 5

Study Three: A Prospective Examination of Coping Strategies and Distress across the Perinatal Period

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The references and formatting for this paper, which form Chapter 5 of this thesis, are presented in accordance with the requirements of the Journal of Anxiety, Stress & Coping, to which this paper has been submitted to and is currently under review.
Abstract

Background and Objectives: The aim of the present study was to investigate the type of coping strategies used by women across the perinatal period; and to also explore the prospective and concurrent relationships between coping strategies and depressive, anxiety and stress symptoms.

Design and Methods: Participants (N=283) completed the Edinburgh Postnatal Depression Scale (EPDS), the Anxiety and Stress subscales from the Depression, Anxiety, Stress Scale (DASS-21 item) and the COPE Inventory (COPE) at 16, 24 and 32 weeks gestation, and at 3, 6, 9 and 12 months postpartum. The Prenatal Coping Inventory (PCI) was also completed at 16, 24 and 32 weeks gestation.

Results: The most frequently used pregnancy-specific coping strategy was Planning-Preparation followed by Avoidance, with Spiritual coping being least frequently used. Emotional Support, Planning, Instrumental Social Support, Positive Reinterpretation/Growth and Active Coping were the most frequently used general coping strategies. A strong stability model was demonstrated with earlier coping strongly predicting later coping, both antenatally and postnatally. A range of coping strategies also predicted distress symptoms at different times, with pregnancy-specific Avoidance being the most consistent predictor of distress. Distress levels were also shown to have an impact on coping strategies, thus indicating a bi-directional relationship.

Conclusion: These findings indicate that the coping strategies used by women to deal with the demands of the perinatal period remain largely stable over time. Pregnancy-specific Avoidance was found to be the most consistent predictor of distress, suggesting a potential target for intervention. Patterns between coping and depression, anxiety, stress symptoms differed, thus
highlighting the importance of adopting a broader framework when examining coping and distress during the perinatal period.

**Key words:** pregnancy, postpartum, perinatal, depression, anxiety, stress, coping
Introduction

Pregnancy and the postpartum period is a time in a woman’s life that involves major changes and adjustments. This perinatal period can be associated with significant distress, as a substantial body of research shows that varying degrees of depression and anxiety affects approximately 10-25% and 25-45% of women respectively (Howard, Piot & Stein, 2014). Early recognition and treatment of perinatal mental health disorders is critical given that the consequences affect the mother, her foetus and infant, her partner and family, as well as her social and occupational functioning. Related costs to the health system are also noteworthy, with a recent report in the UK revealing that the long-term economic costs of perinatal mental disorders exceed £8 billion for each annual cohort of mothers and infants (Bauer et al, 2014). In Australia, total health care costs for maternal and paternal PND in 2012 were estimated to be at $78.66 million, with a further $354.87 million resulting from indirect costs which were largely attributable to productivity losses (Deloitte Access, 2012).

The context of pregnancy and the early postpartum offers a unique opportunity to examine the associations between coping and distress (Yali & Lobel, 2002). Pregnancy in particular, is a uniquely finite event, usually lasting between 36-40 weeks, with a clear objective and well-defined endpoint, thus differentiating it from many other significant life events. The transition to motherhood is a major life event experienced by the majority of women, many of whom consider it to be stressful (Dunkel-Schetter, Gurung, Lobel, & Wadhwa, 2001). A significant amount of adjustment is required in response to the many changes that occur within a relatively short period of time (Hamilton & Lobel, 2008; Rahe, 1990). During the perinatal period, women are required to cope not only with the medical events of pregnancy and the birth experience, but with considerable physiological and
psychosocial changes, including a distinct redefinition of one’s roles, changes to one’s lifestyle, and an increase in overall demands (Grant, McMahon, & Austin, 2008; Kearns, Neuwelt, Hitchman, & Lennan, 1997). Parenting concerns, financial strains and medical complications may also be experienced, all of which are potential sources of distress (Yali & Lobel, 1999). Nicolson (1999) described the transition to motherhood as the ‘ultimate paradox’ given that even when women are happy to be mothers, they are also dealing with the loss of their autonomy, as well as changes to their appearance, sexuality and occupational identity.

The transactional model of stress and coping proposed by Lazarus and Folkman (1984) is a useful theoretical framework when investigating how coping strategies may be relevant to the development of perinatal distress, as the model was developed specifically to guide the understanding of how one copes with a stressful situation. The transactional theory appears to be particularly relevant to the experience of pregnancy, birth, and the postpartum in light of the many demands and changes that occur during this time. Given that coping is conceptualised as a dynamic process, and that pregnancy, and to a lesser extent the postpartum, is a process in itself with changing situational demands over time, it has been argued that the coping strategies used across the perinatal period may also change over time (Hamilton & Lobel, 2008; Lazarus, 1993; Pakenham, Smith, & Rattan, 2007) and thus is an area that warrants careful investigation.

When one reviews the past research in this area, three main limitations are noted. These relate to the fact that often limited time-points have been investigated; that research has often focused on particular sub-groups, such as pregnant women with high risk pregnancies; and finally, that different measures have been used, with a notable absence of
pregnancy specific measures; all key issues that were also highlighted in two recent reviews of the literature (Guardino & Dunkel-Schetter, 2013; Razurel, Kaiser, Sellenet, & Epiney, 2013). Most of the research to date on pre- and postnatal coping has assessed coping at only one (e.g., Pakenham et al., 2007; Yali & Lobel, 1999), two (e.g., George et al, Luz, De Tycheey, Thilly, & Spitz, 2013), or three time-points (Hamilton & Lobel, 2008; Huizink, Robles de medina, Mulder, Visser & Buitellar, 2002). The results of these studies have shown that pregnant women do indeed use several coping strategies, such as planning-preparation, avoidance, prayer (Hamilton & Lobel, 2008), problem-focused and emotion focused strategies (Huizink et al., 2002); and that coping can change over time, in response to the changing demands one is dealing with at the time. The limited assessment points however make it difficult to clearly identify when the changes occur, and what the impact of coping may be at different times during the perinatal period. In turn, it has been argued that studies which assess coping across each trimester of pregnancy are needed, in order to better understand the processes in play (Pakenham et al., 2007).

When reviewing the studies that have focused on specific subgroups such as high-risk women in late pregnancy (Demyttenaere, Maes, Nijs, Odendael, & Van Assche, 1995; Lowenkron, 1990); women fertilised by in vitro fertilisation (IVF) (Eugster & Vingerhoets, 1999; Lukse & Vacc, 1999); women with varying medical histories (Levy-Shiff, Lerman, Har-Even, & Hod, 2002), and women who have previously experienced perinatal loss (Nikcevic, Kuczmierczyk, & Nicolaides, 1998), it is clear that while these results provide valuable information, their generalisability to the wider perinatal population is limited. That is, in contrast to high-risk pregnancies, women with a ‘normal’ pregnancy are exposed to an ‘average’ amount of psychosocial stress (Huizink et al., 2002). Given that the majority of
pregnant women fall within this category, it is important that the commonly occurring
processes of coping during ‘normal-risk’ pregnancy are investigated further.

It has also been argued that the use of general coping measures may fail to capture
aspects of coping specific to the prenatal context. In turn, in an effort to assess pregnancy
specific coping, Yali and Lobel (2002) developed the Prenatal Coping Inventory (PCI; Yali &
Lobel, 1999), based on the theoretical framework proposed by Lazarus and Folkman (1984)
and explored the relationships between patterns of coping and emotional distress at 16
weeks and 26 weeks gestation. Results demonstrated that preparation coping was
associated with higher levels of emotional distress, while positive appraisal was the only
coping strategy associated with less distress. Prospective analyses failed to show any
association between coping and distress over time. The only prospective effects to emerge
were that early coping predicted later coping and early distress predicted later distress.
Given that this study was limited to only two time-points, the trajectory of coping not only
across pregnancy but in the postpartum, as well as the prospective relationships between
coping and distress symptoms, required further investigation.

Hamilton and Lobel (2008) also investigated coping in early, mid and late pregnancy in
a diverse sample of women using a revised version of the PCI. Three distinct types of coping
were identified: Planning-Preparation, Avoidance and Spiritual-Positive Coping. Results
showed that spiritual coping was the most frequently used strategy, while avoidant coping
was used the least. Furthermore, while planning was used more consistently across
pregnancy, the use of spiritual coping and avoidance differed across pregnancy.

Extending from the Yali and Lobel (2002) and Hamilton and Lobel (2008) studies,
Borcherding (2009) sought to address two of the common limitations identified, by exploring
patterns of coping in a sample of ‘healthy’ pregnant women in the USA using two coping measures (pregnancy specific and general). Results revealed that Prayer and Task coping were the most frequently used coping styles, with Avoidance being the least frequently used. Borcherding postulated that pregnant women use a variety of coping styles, and that more research is needed with diverse samples to further explore coping styles, including the influence that psychological factors may have. While this study acknowledged the importance of investigating coping in non high-risk pregnancies, and to our knowledge is the only study to date to include both a general and pregnancy specific measure of coping, limitations included the fact that women were excluded from the study if they were multiparous, had a pre-existing medical condition, or required any type of fertility treatment. Furthermore, this study was cross-sectional with coping assessed at a single time-point (during the third trimester of pregnancy) and did not assess any psychological factors.

Previous studies that have adopted a broader scope and included psychosocial factors, have indicated that a bi-directional relationship may also exist between coping and emotional distress; although results are varied. Higher threat appraisal, wishful thinking and lower positive reappraisal coping during pregnancy have been related to increased depressive symptoms at the same time (Pakenham et al., 2007), while the use of maladaptive coping strategies such as negative appraisal (Honey, Bennett, & Morgan, 2003), and avoidant coping (Gotlib, Whiffen, Wallace, & Mount, 1991; Honey, Morgan, Bennett, 2002; Terry, Mayocchi, & Hynes, 1996), have been linked to the onset of postnatal depression. Avoidance during pregnancy has also been associated with greater anxiety, depression and pregnancy-specific stress, while use of positive appraisal has been related to
lower levels of anxiety and emotional distress in pregnancy (Da Costa, Larouche, Dritsa, & Brender, 2000; Yali & Lobel, 1999). When investigating predictors of coping, Hamilton and Lobel (2008) found that pregnancy-specific distress strongly predicted planning but also avoidance, with high state anxiety also predicting use of avoidance.

In one of the few studies to specifically focus on anxiety symptoms and coping, George et al. (2013) explored these relationships at two time-points: late pregnancy and at two months postpartum. Findings indicated that in the last trimester of pregnancy, women with severe anxiety symptoms used coping strategies generally regarded as adaptive less frequently at that time (i.e., concurrent coping). This presentation then remained significantly associated with anxiety post-birth. Furthermore, the higher the level of anxiety, the more likely was the use of problematic coping strategies such as denial and self-blame. George et al. argued that problematic coping may play a role in persisting anxiety, however once again this study was limited to two time-points and only assessed anxiety. To our knowledge no research to date has investigated the prospective relationships between depression, anxiety, stress and coping strategies during both pregnancy and the postpartum period in the one study.

Collectively, the findings from previous studies indicate that the relationships between coping and distress are far from simple or clearly understood. Results are further confounded by the fact that most studies have not controlled for baseline distress (i.e., depression and/or anxiety at the earlier time-points), a known key predictor of later distress (Guardino & Dunkel Schetter, 2013). In an effort to attain a better understanding of a broader conceptualization of maternal distress, it is worthwhile investigating the influence
that coping strategies have on different symptoms, and whether they differ from one another, as well as the impact that distress then has on concurrent coping.

In light of the negative outcomes that often result if a successful transition is not made during the perinatal period, information pertaining to how new mothers cope and adapt to their changing circumstances are of particular interest. This information may be particularly pertinent in better understanding why distress symptoms often increase at certain time-points (e.g., late pregnancy, first 3 months postpartum) as shown repeatedly by past research (e.g., Moss, Skouteris, Wertheim, Paxton, & Milgrom, 2009; Rallis, Skouteris, Milgrom, & McCabe, 2014; Skouteris, Wertheim, Rallis, Paxton, & Milgrom, 2009). Such insight will assist health professionals in better informing screening and early intervention strategies for perinatal distress during these critical periods.

The overall aim of this study was threefold: (1) to examine the type of coping strategies used in a sample of women throughout pregnancy and the first twelve months postpartum using both a pregnancy specific and general measure; (2) to investigate the prospective and concurrent relationships between depression, anxiety and stress levels and coping strategies; and (3) to evaluate this association during late pregnancy and the early postpartum period.

**Method**

*Participants*

Three hundred and one women were recruited as part of a large prospective study. The majority of the women were born in Australia (84.5%), with 15.5% originating from other countries (5.3% from New Zealand, 4.9% from the UK, 2.5% from Europe, 1.7% from North America, and 0.7% and 0.4% from Asia and Africa respectively). The women were
recruited at 10-16 weeks gestation via pregnancy and birth magazines, online forums for expectant and new parents, as well as via word of mouth and community advertising, from various states of Australia. The women were aged between 19 and 44 years ($M = 30.92$ years, $SD = 4.27$). The majority of the women were married (77.0%), while 21.6% were in a de-facto relationship and 1.4% were single. Fifty-six percent of the participants were primiparous; with 10.7% of the women indicating that they required assistance conceiving their current pregnancy. At the commencement of the study, most of the women were in paid employment (78.8%); with 50.0% working full-time. An annual family income in excess of A$105,001 was reported by 62.9% of the women, 25.2% reported an income between A$65,001-105,000, and 11.9% reported an income below A$65,000.

**Measures**

*Demographics Questionnaire.* The Demographics Questionnaire obtained information regarding age, annual household income, parity status, ethnicity, employment and marital status.

*Perinatal Anxiety and Stress.* Perinatal anxiety and stress were assessed using the Anxiety and Stress subscales from the Depression, Anxiety and Stress Scales – short form (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 is a self-report scale with 7 items in each category of Depression, Anxiety and Stress symptoms, thus the 7 anxiety and 7 stress items were used in the present study. Responses are scored on a 4-point Likert scale ranging from 0 to 3, with elevated scores indicating higher levels of anxiety and stress.

The DASS-21 is a widely used, standardised instrument found to reliably distinguish between the symptoms of depression, anxiety and stress in clinical as well as non-clinical samples (Henry & Crawford, 2005), and has demonstrated strong reliability and validity.
with Cronbach’s alpha .87 and .91 for anxiety and stress respectively (Crawford & Henry, 2003). In the current study alpha coefficients ranged from: .61 to .74 for the Anxiety subscale, and .79 to .89 for the Stress subscale.

**Perinatal Depression.** The Edinburgh Postnatal Depression Scale was used to assess the levels of depressive symptomatology (EPDS; Cox, Holden & Sagovsky, 1987). The EPDS is a 10-item self report scale which assesses depressive symptoms experienced within the previous week. Responses to statements are scored on a 4-point Likert scale ranging from 0 to 3, with higher scores indicative of greater intensity of depressive symptoms. The EPDS was initially developed for use with postnatal women and later validated for use with antenatal women also (Bergink et al., 2011), and has been extensively used with sensitivity levels of .86, specificity levels of .76 and strong reliability with Cronbach’s alpha .87 (Cox et al., 1987; Harris, Huckle, Thomas, Johns & Fung, 1989). In the present study Cronbach’s alpha for internal consistency ranged from .78 to .88.

**General Coping.** The COPE Inventory was used to assess general coping strategies (COPE; Carver, Scheier, & Weintraub, 1989). The COPE is a 60-item self report scale which assesses what individuals generally do and feel, when they experience stressful events. Responses to statements are scored on a 4-point Likert-type scale ranging from 1 (I usually don’t do this at all) to 4 (I usually do this a lot), with higher scores indicating greater use of the given coping strategy in response to stressful events. Items are summed with responses forming a total of 15 subscales (each subscale is comprised of 4 items), namely: Positive Reinterpretation and Growth, Mental Disengagement, Focus on and Venting of Emotions, Use of Instrumental Social Support, Active Coping, Denial, Religious coping, Humor,
Behavioral Disengagement, Restraint, Use of Emotional Social Support, Substance use, Acceptance, Suppression of Competing Activities, and Planning.

The COPE can be used in different formats. One is a ‘dispositional’ or trait-like version in which respondents report the extent to which they usually practice the strategies listed, when they are stressed. A second is a time-limited version in which respondents indicate the degree to which they have been employing each strategy during a particular period up to the present. In the current study the time-limited version was used, as women were asked to indicate how often they used the strategies within the preceding month. This version was used given that one of the broader aims of the study was to assess if use of coping strategies would change over time.

The COPE has been extensively used with a wide variety of populations, including perinatal women with strong reliability. In the present study Cronbach’s alpha for internal consistency ranged from .72 to .83 for the Growth, .63 to .74 for the Disengagement, .77 to .88 for the Focus Venting, .78 to .86 for the Instrumental Social Support, .73 to .83 for the Active Coping, .61 to .88 for the Denial, .94 to .97 for the Religion, .88 to .94 for the Humour, .63 to .81 for the Behavioural Disengagement, .71 to .81 for the Restraint, .80 to .89 for the Emotional Support, to .63 to .94 for the Substance Use, .70 to .82 for the Acceptance, .64 to .75 for the Suppression, and .81 to .88 for the Planning subscale.

**Prenatal Specific Coping.** The Revised Prenatal Coping Inventory was used to assess pregnancy specific coping strategies (NuPCI; Yali & Lobel, 2008). The NuPCI is comprised of 32 items scored from 0 (never) to 4 (almost always). Items are summed with responses comprising three subscales: Planning-Preparation (15 items); Avoidance (11 items) and Spiritual-Positive (6 items) Coping. The NuPCI was developed specifically for the use within
the antenatal period and has demonstrated strong internal consistency with an alpha of .86, .90 and .70 for the Planning-Preparation, Avoidance, and Spiritual-Positive scales respectively (Yali & Lobel, 2008). In the present study Cronbach’s alpha ranged from: .85 to .86 for the Planning/Preparation subscale, .73 to .79 for the Avoidance subscale, and .71 to .74 for the Spiritual subscale.

Procedure

Following university ethics approval and written informed consent from participants, women were mailed the questionnaire packs, with reply paid envelopes. Participants completed the Anxiety and Stress subscales from the DASS-21, the EPDS and the COPE at 16, 24 and 32 weeks gestation, and at 3, 6, 9 and 12 months postpartum. Given that the PCI is an antenatal specific measure, it was completed only at 16, 24 and 32 weeks gestation. In regards to participant attrition, 301 women completed the initial questionnaire (at 16 weeks gestation). Preliminary data screening showed that 18 women had largely incomplete data, with four women only completing the first time-point (16 weeks gestation) and a further 14 women only completing two time-points (usually the first two at 16 and 20 weeks gestation) and were therefore excluded from all analyses. This resulted in an antenatal sample of 283 women. Mean depressive, anxiety and stress scores at 16 weeks gestation did not differ for the women included in the current study, and those not included (n=18; p>.05).

During the postpartum (PP) phase of the study attrition rates increased, as would be expected. Ten women did not return any postpartum time-points, and a further 15 women only completed one or two postpartum time-points. Following all data screening the final sample size at each time-point was: 3 months PP: N=249; 6 months PP: N=227; 9
months PP: N=192; 12 months PP: N=152. A total of 137 women completed all 7 study time-points.

Results

Data Analysis

The results reported here forth are based on the 7 time-points as follows: Time 1 (T1): 16 weeks gestation (M = 16.54 weeks, SD = 0.94); Time 2 (T2): 24 weeks gestation (M = 24.42 weeks, SD = 0.82); Time 3 (T3): 32 weeks gestation (M = 32.61 weeks, SD = 0.82); Time 4 (T4): 3 months postpartum (M = 13.31 weeks, SD = 1.76); Time 5 (T5) 6 months postpartum (M = 25.99 weeks, SD = 2.07); Time 6 (T6): 9 months postpartum (M = 38.48 weeks, SD = 3.02); and Time 7 (T7): 12 months postpartum (M = 52.51 weeks, SD = 1.53).

Prior to any analyses being conducted, the appropriate transformations were applied to the DASS Anxiety subscale, the COPE Religion and the COPE Substance Use subscales at all time-points in order to address skewness. Square root transformations were applied to the DASS-Anxiety subscale and LOG transformations were applied to the COPE-Religion subscale. Following the transformations, these variables were normally distributed. Transformed variables are included in all the relevant analyses; however the means and standard deviations reported throughout the paper are based on the original non-transformed variables. The COPE-Substance Use subscale remained skewed even after all transformations were tested. Given that this measure assessed substance use in the current sample of perinatal women the extreme skewness was not surprising. Nonetheless given that normality is a key assumption for the analyses to be conducted the COPE-Substance Use subscale was excluded from all analyses. Study variables were also assessed for multicollinearity, linearity and singularity. All of these assumptions were met.
Investigating the types of Coping Strategies over time as assessed by the PCI and COPE

Descriptive analyses were conducted to explore which coping strategies were most often used by women at the first antenatal time-point (16wks gestation), and again at the first postnatal time-point (3 months PP). Results revealed that Planning-Preparation was the most frequently pregnancy-specific coping strategy used. Avoidance was less frequently used, with Spiritual coping being the least frequently used strategy. When exploring use of general coping strategies, Emotional Support, Planning, Instrumental Social Support, Positive Reinterpretation/Growth and Active Coping were the most frequently used. Substance Use, Denial and Religious coping were the least frequently used strategies. Means and standard deviations depicting the tendency for women to use each of the given coping strategies across the COPE and PCI in response to stressful events are shown in Table 1.
Table 1

The Means Scores (and SDs) for Coping Strategies used by Women, as Assessed by the PCI and COPE

<table>
<thead>
<tr>
<th></th>
<th>T1: 16wks Preg M(SD); n= 283</th>
<th>T4: 3 months PP M(SD); n = 249</th>
<th>Possible Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI: Planning-Preparation</td>
<td>34.96 (8.86)</td>
<td>N/A</td>
<td>0-60</td>
</tr>
<tr>
<td>PCI: Avoidance</td>
<td>10.81 (5.28)</td>
<td>N/A</td>
<td>0-44</td>
</tr>
<tr>
<td>PCI: Spiritual</td>
<td>6.87 (4.35)</td>
<td>N/A</td>
<td>0-24</td>
</tr>
<tr>
<td>COPE: Growth</td>
<td>11.08 (2.41)</td>
<td>10.55 (2.45)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Disengagement</td>
<td>8.15 (2.09)</td>
<td>7.79 (1.73)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Focus Venting</td>
<td>9.81 (2.71)</td>
<td>10.03 (2.44)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Instrumental Social Support</td>
<td>11.18 (2.49)</td>
<td>11.50 (2.02)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Active Coping</td>
<td>10.85 (2.34)</td>
<td>10.64 (2.40)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Denial</td>
<td>4.86 (1.25)</td>
<td>5.13 (1.49)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Religion</td>
<td>5.53 (3.03)</td>
<td>2.28 (2.77)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Humour</td>
<td>8.37 (2.86)</td>
<td>7.76 (2.73)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Behavioural Disengagement</td>
<td>5.66 (1.53)</td>
<td>6.16 (1.80)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Restraint</td>
<td>8.67 (2.13)</td>
<td>8.62 (1.95)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Emotional Social Support</td>
<td>11.32 (2.81)</td>
<td>11.24 (2.33)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Substance Use</td>
<td>4.06 (0.38)</td>
<td>4.24 (0.94)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Acceptance</td>
<td>10.54 (2.23)</td>
<td>10.76 (2.09)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Suppression</td>
<td>8.33 (2.09)</td>
<td>9.02 (2.03)</td>
<td>4-16</td>
</tr>
<tr>
<td>COPE: Planning</td>
<td>11.27 (2.47)</td>
<td>11.12 (2.74)</td>
<td>4-16</td>
</tr>
</tbody>
</table>

In order to assess the trajectory of coping strategies over time, a series of repeated measures ANOVA’s were performed, exploring changes in coping strategies used as reported on the PCI and COPE. Given that the assumption of sphericity was not met a Huynh-Feldt Epsilon adjustment was implemented for all ANOVA’s (Tabachnick & Fidell, 2013). All post hoc comparisons were conducted with a Bonferroni adjustment for multiple comparisons. Differences for both the PCI and COPE scales are presented in Table 2 along with the means and standard deviations. The $F$ ratios and effect sizes ($\eta^2$) results from the ANOVA’s are also presented. Significant differences between time points for each coping strategy are shown with an asterisk (*), with superscript numbers denoting the time points which differ significantly.
Table 2

PCI and COPE Subscale Post-Hoc Comparisons Assessing Mean Differences Between the Pregnancy Study Time Points.

<table>
<thead>
<tr>
<th></th>
<th>T1: 16wks Preg M(SD);</th>
<th>T2: 24wks Preg M(SD);</th>
<th>T3: 32wks Preg M(SD);</th>
<th>ANOVA F test results ($\eta^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI: Planning-</td>
<td>34.96 (8.86)</td>
<td>35.38 (7.49)</td>
<td>37.89 (7.49)*</td>
<td>36.99* ($\eta^2 = .12$)</td>
</tr>
<tr>
<td>Preparation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCI: Avoidance</td>
<td>10.81 (5.28)</td>
<td>11.22 (5.41)</td>
<td>12.23 (5.47)*</td>
<td>16.77* ($\eta^2 = .06$)</td>
</tr>
<tr>
<td>PCI: Spiritual</td>
<td>6.87 (4.35)</td>
<td>6.97 (3.93)</td>
<td>6.65 (3.83)</td>
<td>2.20</td>
</tr>
<tr>
<td>COPE: Growth</td>
<td>11.08 (2.41)</td>
<td>10.83 (2.34)</td>
<td>10.77 (2.20)</td>
<td>3.62</td>
</tr>
<tr>
<td>COPE: Disengagement</td>
<td>8.15 (2.09)</td>
<td>7.92 (1.93)</td>
<td>7.89 (1.93)</td>
<td>3.51</td>
</tr>
<tr>
<td>COPE: Focus Venting</td>
<td>9.81 (2.71)</td>
<td>9.53 (2.27)</td>
<td>9.76 (2.55)</td>
<td>2.69</td>
</tr>
<tr>
<td>COPE: Instrumental Social Support</td>
<td>11.18 (2.49)</td>
<td>11.26 (2.31)</td>
<td>11.23 (2.36)</td>
<td>0.18</td>
</tr>
<tr>
<td>COPE: Active Coping</td>
<td>10.85 (2.34)</td>
<td>11.02 (2.12)</td>
<td>10.83 (2.18)</td>
<td>1.67</td>
</tr>
<tr>
<td>COPE: Denial</td>
<td>4.86 (1.25)*</td>
<td>5.16 (1.57)</td>
<td>5.15 (1.53)</td>
<td>7.83* ($\eta^2 = .03$)</td>
</tr>
<tr>
<td>COPE: Religion</td>
<td>5.53 (3.03)*</td>
<td>5.24 (2.58)</td>
<td>5.14 (2.34)</td>
<td>8.83* ($\eta^2 = .03$)</td>
</tr>
<tr>
<td>COPE: Humour</td>
<td>8.37 (2.86)*</td>
<td>7.97 (2.76)</td>
<td>7.97 (2.64)</td>
<td>6.40* ($\eta^2 = .02$)</td>
</tr>
<tr>
<td>COPE: Behavioural Disengagement</td>
<td>5.66 (1.53)</td>
<td>5.79 (1.72)</td>
<td>5.78 (1.81)</td>
<td>1.16</td>
</tr>
<tr>
<td>COPE: Restraint</td>
<td>8.67 (2.13)</td>
<td>8.67 (1.97)</td>
<td>8.80 (1.99)</td>
<td>1.36</td>
</tr>
<tr>
<td>COPE: Emotional Social Support</td>
<td>11.32 (2.81)</td>
<td>10.97 (2.37)</td>
<td>11.14 (2.59)</td>
<td>3.13</td>
</tr>
<tr>
<td>COPE: Substance Use</td>
<td>4.06 (0.38)</td>
<td>4.21 (0.94)</td>
<td>4.14 (0.53)</td>
<td>N/A</td>
</tr>
<tr>
<td>COPE: Acceptance</td>
<td>10.54 (2.23)</td>
<td>10.36 (2.09)</td>
<td>10.24 (2.13)</td>
<td>2.98</td>
</tr>
<tr>
<td>COPE: Suppression</td>
<td>8.33 (2.09)*</td>
<td>8.94 (1.89)</td>
<td>8.86 (1.93)</td>
<td>16.02* ($\eta^2 = .05$)</td>
</tr>
<tr>
<td>COPE: Planning</td>
<td>11.27 (2.47)</td>
<td>11.44 (2.27)</td>
<td>11.22 (2.39)</td>
<td>1.97</td>
</tr>
</tbody>
</table>

Note: T1 – Time 1; T2 – Time 2; T3 – Time 3. Cases were excluded pairwise; n=283;

* Difference is significant at the 0.05 level
As shown in Table 2 when investigating changes in pregnancy specific coping strategies over time, using the PCI, significant differences were noted for the Planning/Preparation and Avoidance subscales, but not the Spiritual subscale. Post hoc comparisons revealed that use of Planning-Preparation coping strategies increased over time with levels at 32 weeks gestation being significantly higher compared to 16 weeks and 24 weeks. Use of Avoidant coping strategies also increased as women’s pregnancies progressed with levels at 32 weeks gestation being significantly higher than those at 16 and 24 weeks.

When investigating changes in general coping strategies across pregnancy using the COPE, significant differences were only revealed for the Denial, Religion, Humour and Suppression subscales. Specifically, use of Denial, Humour and Suppression were all lower at T1 compared to T2 and T3; while use of Religion was higher at T1 compared to T3.

Table 3 presents the differences for the COPE scale during the postpartum, along with the means and standard deviations. Significant differences between time points for each coping strategy are again shown with an asterisk (*), with superscript numbers denoting the time points which differ significantly. The \( F \) ratios and effect sizes (\( \eta^2 \)) results from the ANOVA’s are also presented.
### Table 3

**COPE Subscale Post-Hoc Comparisons Assessing Mean Differences Between the Postpartum Study Time Points.**

<table>
<thead>
<tr>
<th>COPE Subscale</th>
<th>T4: 3PP M(SD)</th>
<th>T5: 6PP M(SD)</th>
<th>T6: 9PP M(SD)</th>
<th>T7: 12PP M(SD)</th>
<th>ANOVA F test results ((\eta^2))</th>
</tr>
</thead>
<tbody>
<tr>
<td>COPE: Growth</td>
<td>10.55 (2.45)</td>
<td>10.94 (2.47)</td>
<td>10.83 (2.13)</td>
<td>11.23 (2.41)</td>
<td>2.06 ((\eta^2 = .01))</td>
</tr>
<tr>
<td>COPE: Disengagement</td>
<td>7.79 (1.73)</td>
<td>7.81 (1.88)</td>
<td>7.78 (1.79)</td>
<td>7.64 (1.94)</td>
<td>0.46 ((\eta^2 = .00))</td>
</tr>
<tr>
<td>COPE: Focus Venting</td>
<td>10.03 (2.44)</td>
<td>9.56 (2.51)</td>
<td>9.58 (2.49)</td>
<td>9.61 (2.86)</td>
<td>0.67 ((\eta^2 = .00))</td>
</tr>
<tr>
<td>COPE: Instrumental Social Support</td>
<td>11.50 (2.02)</td>
<td>11.73 (2.35)</td>
<td>11.53 (2.13)</td>
<td>11.69 (2.53)</td>
<td>1.74 ((\eta^2 = .01))</td>
</tr>
<tr>
<td>COPE: Active Coping</td>
<td>10.64 (2.40)</td>
<td>10.80 (2.34)</td>
<td>10.93 (1.93)</td>
<td>10.91 (2.41)</td>
<td>1.43 ((\eta^2 = .01))</td>
</tr>
<tr>
<td>COPE: Denial</td>
<td>5.13 (1.49)</td>
<td>5.16 (1.63)</td>
<td>5.16 (1.47)</td>
<td>5.54 (1.91)* T4</td>
<td>3.88* ((\eta^2 = .03))</td>
</tr>
<tr>
<td>COPE: Religion</td>
<td>5.28 (2.78)</td>
<td>5.31 (2.65)</td>
<td>5.11 (2.67)</td>
<td>5.27 (2.73)</td>
<td>0.64 ((\eta^2 = .00))</td>
</tr>
<tr>
<td>COPE: Humour</td>
<td>7.76 (2.73)</td>
<td>7.94 (2.75)</td>
<td>8.58 (2.79)</td>
<td>8.75 (3.16)*T4</td>
<td>5.25* ((\eta^2 = .04))</td>
</tr>
<tr>
<td>COPE: Behavioural Disengagement</td>
<td>6.16 (1.80)</td>
<td>6.23 (1.87)</td>
<td>6.16 (2.01)</td>
<td>5.94 (2.01)</td>
<td>0.17 ((\eta^2 = .00))</td>
</tr>
<tr>
<td>COPE: Restraint</td>
<td>8.2 (1.95)</td>
<td>8.89 (2.18)</td>
<td>9.01 (1.96)</td>
<td>8.83 (1.99)</td>
<td>1.35 ((\eta^2 = .01))</td>
</tr>
<tr>
<td>COPE: Emotional Social Support</td>
<td>11.24 (2.33)</td>
<td>11.25 (2.63)</td>
<td>10.86 (2.47)</td>
<td>11.34 (2.69)</td>
<td>0.54 ((\eta^2 = .00))</td>
</tr>
<tr>
<td>COPE: Substance Use</td>
<td>4.23 (0.94)</td>
<td>4.56 (1.32)</td>
<td>4.36 (1.24)</td>
<td>4.46 (1.37)</td>
<td>N/A</td>
</tr>
<tr>
<td>COPE: Acceptance</td>
<td>10.76 (2.09)</td>
<td>10.45 (2.37)</td>
<td>10.69 (2.41)</td>
<td>10.29 (2.47)</td>
<td>1.86 ((\eta^2 = .01))</td>
</tr>
<tr>
<td>COPE: Suppression</td>
<td>9.02 (2.03)</td>
<td>9.10 (2.33)</td>
<td>8.98 (1.82)</td>
<td>8.88 (2.07)</td>
<td>0.43 ((\eta^2 = .00))</td>
</tr>
<tr>
<td>COPE: Planning</td>
<td>11.12 (2.74)</td>
<td>11.16 (2.68)</td>
<td>11.24 (2.41)</td>
<td>11.51 (2.50)</td>
<td>0.95 ((\eta^2 = .00))</td>
</tr>
</tbody>
</table>

*Note:* Cases were excluded pairwise; n=137; T4 – Time 4; T5 – Time 5; T6 – Time 6; T7 – Time 7

* Difference is significant at the 0.05 level
As noted in Table 3, when investigating changes in general coping strategies post birth significant differences were evident only for the Denial and Humour subscales. These results are shown below. Post hoc comparisons revealed that use of Denial was significantly higher at T7 compared to T4, while the use of Humour was significantly higher at T7 compared to T4 and T5. It should be noted that both antenatally and postnatally, the effect sizes related to the significant differences were rather small, indicating that coping strategies remained relatively stable over time.

*Investigating the Prospective Relationships between Coping Strategies and Distress Symptoms across the Perinatal Period.*

*Stability Models of Coping Strategies.* Prospective models of all the PCI and COPE subscales were assessed via partial correlations. The first was a stability model, in which each PCI and COPE subscale at each time point predicted the respective PCI and COPE subscale at all subsequent time points (e.g., COPE-Growth at 16wks predicting COPE-Growth at 24wks, 32wks etc). Results showed that the use of each coping strategy at 16 weeks gestation predicted the use of the strategy at each subsequent time-point. The range of \( r \) values and associated significance levels were as follows: PCI-Planning-Preparation: \( r = .614-.713, \ p < .001 \); PCI-Avoidance: \( r = .622-.725, \ p < .001 \); PCI-Spiritual: \( r = .771-.828, \ p < .001 \); COPE-Growth: \( r = .293-.722, \ p < .001 \); COPE-Disengagement: \( r = .308-.681, \ p < .001 \); COPE-Focus Venting \( r = .396-.718, \ p < .001 \); COPE-Instrumental Social Support \( r = .320-.721, \ p < .001 \); COPE-Active Coping \( r = .384-.674, \ p < .001 \); COPE-Denial \( r = .143-.656, \ p < .05 \); COPE-Religion \( r = .641-.914, \ p < .001 \); COPE-Humour \( r = .416-.756, \ p < .001 \); COPE-Behavioural Disengagement \( r = .286-.630, \ p < .001 \); COPE-Restraint \( r = .232-.669, \ p < .001 \); COPE-
Emotional Social Support $r = .392-.682, p < .001$; COPE-Acceptance $r = .260-.607, p < .001$; COPE-Suppression $r = .265-.576, p < .001$; COPE-Planning $r = .372-.695, p < .001$.

These results indicate that the coping strategies used by women appeared to be largely stable over time. The models were then repeated; however the effects of depression, anxiety and stress at the first time-point were partialled out in an effort to assess whether stability of coping was influenced by women’s initial distress levels. Results revealed that even after controlling for depression, anxiety and stress scores the use of each coping strategy significantly predicted the use of the strategy at all other time-points indicating strong stability across time. This was the case for all subscales on both the COPE and PCI.

*Prospective Models of Coping Styles predicting Depression, Anxiety and Stress*

Prospective models of coping strategies at early pregnancy (16 weeks gestation) predicting Depression, Anxiety and Stress levels at Late Pregnancy (32 weeks gestation), and Depression, Anxiety and Stress predicting concurrent coping strategies at Late Pregnancy (32 weeks gestation) were also conducted. When exploring the pregnancy-specific coping styles on the PCI, only the Avoidance subscale was significantly associated with the distress symptoms. Figure 1 below illustrates the relationships between early Avoidant coping predicting later antenatal depressive, anxiety and stress symptoms; and later distress predicting concurrent Avoidant coping, before and after controlling for early distress and coping levels respectively.
Significant relationships between use of Avoidance as a coping strategy at 16 weeks and Depression and Anxiety levels at 32 weeks emerged, even after controlling for Depression and Anxiety at 16 weeks respectively. Avoidance did not predict Stress at 32 weeks once Stress at 16 weeks had been controlled for. Depression, anxiety and stress all predicted concurrent use of Avoidance at 32 weeks, even after controlling for Avoidance at earlier time-points.

Prospective relationships between PCI coping strategies during late pregnancy (32 weeks) and distress symptoms during the early postpartum (3 months PP) were also assessed. When exploring the pregnancy-specific coping strategies on the PCI, again only the Avoidance subscale was associated with distress symptoms at 3 months post-birth. Results revealed a significant relationship between use of Avoidance as a coping strategy at 32 weeks gestation and Anxiety at 3 months postpartum, even after controlling
Anxiety at 32 weeks. Avoidance at 32 weeks did not predict depression or stress scores at 3 months postpartum once depression and stress at 32 weeks had been controlled for.

Figure 2 shows the relationships between Avoidance at late pregnancy and early postnatal distress symptoms, before and after controlling for antenatal distress levels. Concurrent coping at 3 months postpartum was not assessed in this model, as the PCI is a pregnancy specific measure.

Figures 3, 4 and 5 illustrate the antenatal relationships between general coping strategies as assessed by the COPE, during early pregnancy (16 weeks gestation) and distress symptoms during late pregnancy (32 weeks gestation). Results revealed that Active Coping and Acceptance were negatively associated with Depression; Instrumental Social Support and Emotional Support were negatively associated with Anxiety; and Instrumental Social Support, Emotional Support, Active Coping, Humour and Planning were negatively associated Stress symptoms. These relationships remained significant even after controlling for Depression, Anxiety and Stress at the earlier time point.
When investigating the relationships between Depression, Anxiety and Stress and concurrent coping at 32 weeks gestation different patterns emerged for each measure. Specifically, Depression predicted increased use of Disengagement and Focus Venting and decreased use of Growth, Instrumental Social Support, Active Coping, Humour, Planning and Emotional Support at the same time, even after controlling for coping earlier on in pregnancy. Anxiety at 32 weeks predicted increased use of Mental and Behavioural Disengagement and decreased use of Instrumental Social Support and Emotional Support concurrently, even after controlling for coping earlier on in pregnancy. Stress at 32 weeks predicted increased use of Mental and Behavioural Disengagement, Focus on and Venting of Emotions, Suppression, and decreased use of Instrumental Social Support, Emotional Support and Planning, even after controlling for coping earlier on in pregnancy.

![Figure 3. Partial correlations between the COPE Subscales of Instrumental Active Coping, Acceptance and EPDS at 32 weeks gestation, before (in italics), and after controlling for EPDS scores at the earlier time point (in bold); and between EPDS, at 32 weeks gestation predicting concurrent coping strategies after controlling for coping at the earlier time-point; solid lines indicate significant prospective relationship, dotted lines indicate significant concurrent relationship; * p<.05; **p<.001;](image-url)
Figure 4. Partial correlations between the COPE Subscales of Instrumental Social Support, Emotional Social Support, and DASS-Anxiety at 32 weeks gestation, before (in italics), and after controlling for DASS-Anxiety at the earlier time point (in bold); and between DASS-Anx at 32 weeks gestation predicting concurrent coping strategies after controlling for coping at the earlier time-point; solid lines indicate significant prospective relationship, dotted lines indicate significant concurrent relationship; * p<.05; **p<.001;

Figure 5. Partial correlations between the COPE Subscales of Instrumental Social Support, Active Coping, Humour, Emotional Social Support, Planning and DASS-Stress subscale at 32 weeks gestation, before (in italics), and after controlling for DASS-Stress at the earlier time point (in bold); * p<.05; **p<.001; and between DASS-Stress at 32 weeks gestation predicting concurrent coping strategies after controlling for coping at the earlier time-point; solid lines indicate significant prospective relationship, dotted lines indicate significant concurrent relationship; * p<.05; **p<.001;
When exploring the prospective relationships between general coping styles as assessed on the COPE, during late pregnancy (32 weeks gestation) and distress symptoms during early postpartum (3 months PP) results revealed a significant negative relationship between Behavioural Disengagement and Depression, and between Positive Reinterpretation/Growth and Anxiety. Use of Focus on and Venting of Emotions was positively associated with Anxiety. These relationships remained significant even after controlling for Depression and Anxiety at the earlier time point. There were no significant relationships between any of the coping strategies at 32 weeks gestation and Stress symptoms at 3 months postpartum, after controlling for Stress at 32 weeks, however Stress at 32 weeks did predict concurrent use of a number of coping strategies.

When investigating the relationships between Depression, Anxiety and Stress and concurrent coping at 3 months postpartum, once again different patterns were noted for each measure as shown in Figures 6, 7 and 8 respectively. Specifically, Depression predicted increased use of Disengagement and Focus Venting and decreased use of Growth, Active Coping, Emotional Support and Planning concurrently. Anxiety at 3 months post-birth predicted increased use of Behavioural Disengagement, Denial and Focus Venting, and decreased use of Growth, Active Coping, Planning and Emotional Support concurrently. Finally, Stress predicted increased use of Mental and Behavioural Disengagement, Focus on and Venting of Emotions, Denial, and decreased use of Growth, Active Coping, Emotional Support and Planning concurrently at 3 months postpartum.
Figure 6. Partial correlations between the COPE Subscale of Behavioural Disengagement at 32 weeks gestation and EPDS at 3 months postpartum, before (in italics), and after controlling for EPDS at the earlier time point (in bold); and between EPDS at 3 months postpartum predicting concurrent coping strategies after controlling for coping at the earlier time-point; solid lines indicate significant prospective relationship, dotted lines indicate significant concurrent relationship; * p<.05; **p<.001;

Figure 7. Partial correlations between the COPE Subscales of Growth and Focus Venting at 32 weeks gestation and DASS-Anxiety EPDS at 3 months postpartum, before (in italics), and after controlling for DASS-Anxiety at the earlier time point (in bold); and between DASS-Anxiety at 3 months postpartum predicting concurrent coping strategies after controlling for coping at the earlier time-point; solid lines indicate significant prospective relationship, dotted lines indicate significant concurrent relationship; * p<.05; **p<.001;
Figure 8. Partial correlations between DASS-Stress at 3 months postpartum predicting concurrent coping strategies after controlling for coping at the earlier time-point; dotted lines indicate significant concurrent relationship; * p<.05; ** p<.001;

Discussion

The first aim of this study was to investigate the types of coping strategies used by women across the perinatal period. Planning-Preparation was the most frequently used pregnancy-specific coping strategy, followed by Avoidance, with Spiritual coping being used the least. When assessing general coping strategies, Emotional Support, Planning, Instrumental Social Support, Positive Reinterpretation/Growth and Active Coping were the most frequently used. Substance Use, Denial and Religious coping were the least frequently used. These findings were consistent across both antenatal and postnatal time-points.

The current findings indicate that the women in the current study frequently used strategies that are generally considered to be adaptive and helpful in managing stressful situations (e.g., use of emotional support and planning). An interesting and somewhat
A novel finding was that some of the current coping patterns are in contrast to those obtained by previous studies; where religious coping for example has been reported to be the most frequently used strategy during pregnancy (e.g., Borcherding, 2009; Hamilton & Lobel, 2008). This difference highlights that cultural issues may be particularly relevant, given that the studies were conducted in different countries. While conducting the present study with a more culturally diverse sample would be ideal, the current results do nonetheless demonstrate what the most typically used coping strategies are, in a community based sample of Australian women.

Use of certain coping strategies were shown to be largely stable over time, with only certain differences noted over time. While women engaged in more Planning-Preparation later in pregnancy (32 weeks gestation), it was interesting to note that Avoidance also increased as women’s pregnancies progressed, peaking at Late Pregnancy. Women engaged less frequently in Denial and Suppression strategies earlier in pregnancy (16 weeks gestation). In contrast women used Humour and Religious coping more often at Early Pregnancy. During the postpartum coping strategies appeared to be even more stable, as differences over time were only evident for use of Denial and Humour, with women engaging in these strategies more so at 12 months post-birth. These results lend support to the argument that women appear to employ a diverse range of strategies to manage the demands associated with the perinatal period, particularly during pregnancy; and that coping is not a static process, but rather a process that is responsive to the changing situational demands over time.

The second aim of the study was to investigate the prospective and concurrent relationships between coping strategies and distress symptoms. A strong stability model
for coping was demonstrated with use of each coping style at earlier times predicting
use of the coping style at later times, both antenatally and postnatally. To our
knowledge this is the first time that coping strategies have been prospectively explored
in this manner. The current results coincide with those obtained by Yali and Lobel (2002)
in that early coping predicts later coping during pregnancy, but also extend previous
research by demonstrating a similar pattern during the postpartum period. Interestingly,
while Yali and Lobel did not find any prospective relationships between coping and
distress levels over time, the current study revealed numerous interrelationships
between various coping strategies and distress symptoms at later time-points.

Increased use of avoidant coping at 16 weeks gestation predicted increases in
depression and anxiety scores later in pregnancy, a relationship that remained significant
even after earlier depression and anxiety levels were controlled for. In contrast, avoidant
coping did not predict stress symptoms later in pregnancy once earlier stress had been
controlled for. Increased use of avoidant coping at 32 weeks gestation also predicted
increased depression, anxiety and stress levels at 3 months postpartum, and all
relationships remained significant after earlier depression, anxiety and stress levels were
controlled for. These findings are in accordance with those obtained by past research
(e.g., George et al, 2013; Yali & Lobel, 1999) where coping by avoidance has been
associated with greater distress during pregnancy; and also indicate a similar pattern
post-birth. Interestingly, depression, anxiety and stress were all shown to predict
concurrent use of Avoidance at 32 weeks gestation. This indicates that there is likely to
be a complex interplay of relationships between avoidant coping and distress, as
Avoidance early on can predict later distress, which in turn appears to be associated with the continued use of Avoidance as a means of coping.

When exploring the impact of general coping strategies, Active Coping and Acceptance at 16 weeks gestation were shown to predict lower levels of depression later in pregnancy, while use of Instrumental Social Support and use of Emotional Support predicted lower levels of anxiety later in pregnancy. These relationships remained significant even when earlier depression and anxiety levels were controlled for respectively. Interestingly, numerous coping strategies earlier in pregnancy predicted lower levels of later antenatal stress, as increased use of Instrumental Social Support, Active Coping, Humour, Emotional Support, and Planning at 16 weeks gestation all predicted lower levels of stress at 32 weeks gestation.

Behavioural Disengagement at 32 weeks gestation predicted depression levels at 3 months post-birth, while decreased use of Positive Reinterpretation/Growth and increased use of Focus on and Venting of Emotions predicted higher anxiety at 3 months postpartum. Both these relationships remained significant after the effects of earlier depression and anxiety had been accounted for. No general coping strategies at 32 weeks gestation were associated with stress symptoms at 3 months post-birth once earlier stress had been controlled for.

When investigating the impact of distress on concurrent coping it was interesting to find that while depression, anxiety and stress all predicted the concurrent use of various general coping strategies at 32 weeks gestation and again at 3 months postpartum, the patterns were different for each distress measure at each time. For example while depression at 32 weeks gestation was associated with decreased use of
Positive Reinterpretation and Growth at the same time, this was not the case for anxiety or stress. Furthermore, the coping strategies that earlier on predicted later distress symptoms, were not always the same strategies that were associated with distress at the later time; i.e., while use of Acceptance at 16 weeks was significantly related to depression levels at 32 weeks, depression at 32 weeks was not significantly associated with use of acceptance at 32 weeks. These patterns indicate the presence of a rather intricate set of interrelationships between coping and maternal distress.

Of further interest was the fact that the PCI, a pregnancy specific coping measure yielded stronger relationships when assessing coping and distress symptoms, as evidenced by the higher $r$ values. In turn, it seems that coping and other measures which have been specifically designed for the antenatal and postnatal period add particular value to the assessment and potentially treatment of perinatal health. Such measures may allow researchers and clinicians alike to capture aspects specific to the perinatal context, which may otherwise be missed. Future research is needed to explore this further.

Collectively, the current findings indicate that different coping strategies appear to predict different distress symptoms at different times; and in turn different distress symptoms are associated with the concurrent use of a distinct set of coping strategies. This is of particular interest as it indicates that conceptualising coping in a dichotomous manner, (i.e., as either adaptive or maladaptive), may be impeding our understanding of a complex process as it is likely to be oversimplifying the issue and the various mechanisms at play. For example, if depression was the only measure of emotional distress in the current study, use of Emotional Support would not have emerged as an
‘important’ coping strategy. However, by also including anxiety and stress we find that while Emotional Support was not associated with depression levels after earlier depression was controlled for, it did predict lower anxiety and stress levels. Furthermore, from a clinical perspective the concurrent relationships are of particular importance, as how women cope with the emergence of depression, anxiety and stress may be important factors in whether assistance is sought and/or whether severe psychopathology develops.

It seems feasible to suggest that there is a need to assess for a range of coping strategies and their influence on a range of distress measures (i.e., not depression or anxiety alone). Given that this is the first study to explore the prospective and concurrent interrelationships between coping strategies, depression, anxiety and stress symptoms, across both pregnancy and the postpartum period, future research examining the role of coping strategies and how their impact may differ across the spectrum of distress symptoms is warranted.

Conclusion

Assessing the coping strategies used by women during the perinatal period appears to add value to the broader assessment framework, as they can be associated with depression, anxiety and stress symptoms later in pregnancy and post-birth, even after accounting for the effects of earlier distress levels. While the majority of women in the current sample were not experiencing clinical levels of psychopathology, the current findings suggest that clinicians involved in the care of perinatal women ought to consider the role that coping strategies may have on their emotional wellbeing. The effectiveness of preventative and intervention programs may also be enhanced if the influence of
different coping strategies is considered and incorporated. Replicating the current study with a clinical sample would help to clarify the clinical significance of the present findings, and any differences that may emerge in the presence of more severe and complex presentations. A wider psychosocial assessment that incorporates other key factors that may be influencing the development and maintenance of distress and/or patterns of coping is also warranted.

Limitations of the current study include the fact that data was collected via self-report measures, as the fact that the majority of the participants were married, tertiary educated women, thus limiting the generalisability of the current findings. Furthermore, the scope of this study did not extend to any additional factors that may contribute to the experience of maternal distress. Future research is needed to explore this further. Despite these limitations, the present findings show that early coping predicts later coping, and that a range of coping strategies are associated with increased depressive, anxiety and stress levels later in pregnancy, and post-birth. Depressive, anxiety and stress levels then appear to influence the coping strategies used to manage the demands at the time, thus indicating the presence of complex interrelationships. If these results are replicated in future research, it may allow health professionals involved in the care of expectant and new mothers to better identify those who are at increased risk of emotional distress across the entire perinatal period. Early identification will no doubt enhance early intervention programs and ideally minimize the length, severity and impact of maternal distress across a range of domains.
Acknowledgements: We extend our thanks and appreciation to the women who participated in this research.
References:


Chapter 6

Study Four: Examining the Role of Coping and Cognitive Appraisal as Unique Predictors of Perinatal Distress: Pre and Post Birth

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Abstract

Background: Research into risk factors for perinatal distress has often focused on postnatal depression, and well established psychosocial risk factors. Recent research has indicated that cognitive appraisal and coping strategies are also relevant, and thus may add to a broader understanding of what other factors contribute to perinatal distress.

Aim: The aim of the present study was to investigate the role of cognitive appraisal and coping strategies as unique predictors of perinatal distress.


Results: The effects of two cognitive appraisal and five specific coping strategies predicted distress at different time-points. Antenatally, pregnancy specific avoidance predicted both increased depression and anxiety symptoms at 32 weeks gestation. Decreased use of Growth/Positive Reinterpretation also predicted depression, while decreased use of Emotional Support predicted anxiety at this time. Post-birth, use of Disengagement independently predicted higher anxiety and stress symptoms at 3 months postpartum, while decreased Planning predicted higher depressive symptoms. Higher Threat appraisal also predicted increased depression symptoms, while higher Uncontrollable appraisal predicted higher anxiety symptoms. At 12 months postpartum, only decreased use of Growth/Positive Reinterpretation predicted depression.

Conclusion: Current findings indicate that certain cognitive appraisal and coping strategies can uniquely contribute to higher distress symptoms, at different times, even after the effects of established risk factors have been accounted for. Cognitive appraisal was shown to be associated
with depression and anxiety but only in the postpartum. The effects of coping strategies were significant during pregnancy and the postpartum, related to depression, anxiety and to a lesser extent stress. The current results suggest that appraisal and coping strategies ought to be considered both from a screening and treatment perspective when working with women during the perinatal period.

**Key words:** coping, appraisal, depression, anxiety, stress, perinatal
Introduction

The perinatal period has been identified as a time in a woman’s life where there is an increased risk for the development of mood and anxiety disturbances (Howard, Piot & Stein, 2014). Such experiences impact not only the mother herself and her family, but also her social functioning. Perinatal mental health disorders also impose significant costs to the health system due to a combination of both direct (e.g., treatment) and indirect costs (e.g., productivity losses) (Bauer, Parsonage, Knapp, Iemmi, & Adelaja, 2014; Deloitte Access, 2012). Given that depression is the leading cause of disease-related disability among women in their childbearing years (15-44 years of age) (Weissman & Olfson, 1995; Bennett, Einarson, Taddio, Koren, & Einarson, 2004), and is often co-morbid with anxiety and stress disorders, it is vital that the mechanisms which underlie the development and maintenance of these mood disturbances are better understood.

Interestingly, despite the considerable amount of research that has previously focused on postpartum depression, and the fact that depressive and anxiety disorders are largely recognized as disorders with high recurrence rates (Hammen & Brennan, 2003; Rubertsson, Wickberg, Gustavsson, & Radestad, 2005), research to date has not examined specific factors that may predict depression, anxiety and stress, both antenatally and postnatally within the one study. Subclinical symptoms are also of interest given that even small changes in depression for example can have a negative impact on infant outcomes and the mother-infant relationship by affecting key processes such as maternal bonding, sensitivity and responsiveness (Milgrom, Westley, & Gemmill, 2004; Tietz, Zietlow & Reck, 2014). Matthey, Barnett, Ungerer, and Waters (2000) argued that adjustment to parenthood is likely to be related to different variables at different times, thus highlighting the need for
prospective studies which assess not only the course of distress during the perinatal period, but also the risk and protective factors at different intervals. It seems feasible to suggest that in order to establish better understanding, recognition, and treatment of a broader conceptualization of maternal distress that includes symptoms of depression, anxiety and stress; it is worthwhile investigating the factors that predict the development of each of these symptoms during pregnancy and the postpartum, and whether they differ from one another.

Past research has shown that a range of factors play a key role in the development of depression and to a lesser extend anxiety, with the majority of this research focusing on predictors of postnatal depression. Psychosocial risk factors appear to be the most consistent predictors, with the strongest predictors being: a past history of depression and/or anxiety (Milgrom et al., 2008; O’Hara & Swain, 1996), a family history of depression and/or other mental health difficulties (Milgrom, Ericksen, Negri, & Gemmill, 2005; Robertson, Grace, Wallington, & Stewart, 2004), lack of support from one’s partner, or marital/relationship discord (Fisher, Feekery, & Rowe-Murray, 2002; Garcia-Esteve et al., 2008; Glazier, Elgar, Goel, & Holzapfel, 2004; Hopkins & Campbell, 2008; Milgrom et al., 2008; O’Hara & Swain, 1996), a lack of practical, financial, emotional and/or social support (Boyce, 2003; Gurung, Dunkel-Schetter, Collins, Rini, & Hobel, 2005; Lee et al., 2007; Milgrom, Martin, & Negri, 1999; Milgrom et al., 2008), and significant life events (Boyce, 2003; Dennis, Janssen, & Singer, 2004; Rubertsson et al., 2005). Other maternal factors such as self esteem (Beck, 2001; Fontaine & Jones, 1997; Lee et al., 2007) and sleep quality (Field et al., 2007; Jomeen & Martin, 2007; Skouteris, Wertheim, Germano, Paxton, & Milgrom, 2009) have also been implicated in the experience of perinatal depression and anxiety.
While one’s past self and family mental health history cannot be altered, current maternal and psychosocial factors are of particular interest as they may be amenable to change, and may thus be directly targeted in clinical interventions.

In addition to key risk factors, how mothers cope and adapt to their changing lifestyle and demands as reflected by cognitive appraisal and coping strategies, may play a key role in the development and/or maintenance of perinatal distress (Hamilton & Lobel, 2008; Lazarus, 1993; Pakenham, Smith & Rattan, 2007). The transition to motherhood is a major life event experienced by the majority of women, many of whom consider it to be stressful (Dunkel-Schetter, Gurung, Lobel, & Wadhwa, 2001). A significant amount of adjustment is necessary in order to effectively cope with the many changes that occur during pregnancy and post-birth (Hamilton & Lobel, 2008; Rahe, 1990). During these times women must cope with the physical and medical events of pregnancy and birth, while also adjusting to major psychosocial changes, including an altered lifestyle, a distinct redefinition of one’s roles, loss of autonomy, changes within the marital/partner relationship, and an increase in overall demands (Grant, McMahon, & Austin, 2008; Kearns, Neuwelt, Hitchman, & Lennan, 1997).

Previous studies that have explored the relationships between coping, appraisal and emotional distress have often used the transactional model of stress and coping (Lazarus & Folkman, 1984) as a theoretical framework, with results indicating the presence of complex interrelationships. Higher threat appraisal and lower positive reappraisal coping during pregnancy have been associated with higher depressive symptoms at the same time (Pakenham et al., 2007), while the use of negative appraisal (Honey, Bennett, & Morgan, 2003) and avoidant coping (Honey, Morgan, Bennett, 2003; Terry, Mayocchi, & Hynes, 1996), has been linked to the development of postnatal depression. Avoidance during
pregnancy has also been associated with greater anxiety, depression and pregnancy-specific stress, while use of positive appraisal has been related to lower levels of anxiety and emotional distress in pregnancy (Da Costa, Larouche, Dritsa, & Brender, 2000; George, Luz, De Tyche, Thilly, & Spitz, 2003; Yali & Lobel, 1999).

Recently, Rallis, Skouteris and Milgrom (paper submitted, 2015) sought to expand upon previous findings by investigating the impact that coping strategies have on depression, anxiety and stress during pregnancy and the postpartum. Results showed that a number of coping strategies were associated with increased distress at different times, with pregnancy-specific Avoidance being the most consistent predictor of distress. Increased use of avoidant coping predicted higher depression and anxiety levels later in pregnancy, and again at 3 months postpartum. The current investigation extends the Rallis et al. (2015) study, by exploring the role of cognitive appraisal and coping strategies as unique predictors of maternal distress; after controlling for the effects of well established risk factors.

While the majority of previous research has examined risk factors of postnatal depression and anxiety, recent studies have shown that symptoms of depression and anxiety are often higher later in pregnancy (30+ weeks gestation) than those post-birth (Evans, Heron, Francomb, Oke, & Golding, 2001; Clark, Skouteris, Wertheim, Paxton, & Milgrom, 2009; Rallis, Skouteris, Milgrom, & McCabe, 2014). Hence research and clinical efforts need to focus on both the antenatal and postnatal period. From a ‘real-world’ and clinical perspective, the impact that current appraisal and coping strategies have on distress are of particular importance; as how women appraise and cope with the demands of the perinatal period may be important factors in whether distress develops or is maintained, and would present a clear target for intervention. To our knowledge no prospective study to
date has investigated both cognitive appraisal and coping as predictors of depression, anxiety and stress pre and post birth.

The overall aim of this study was to examine cognitive appraisal and coping strategies as predictors of depression, anxiety and stress, at 32 weeks gestation, 3 months postpartum and at 12 months postpartum; and whether they uniquely contribute to the development of maternal distress after controlling for the effects of well established risk factors.

Method

Participants

Three hundred and one women were recruited as part of a large prospective study. The majority of the women were born in Australia (84.5%), with 15.5% originating from other countries (5.3% from New Zealand, 4.9% from the UK, 2.5% from Europe, 1.7% from North America, and 0.7% and 0.4% from Asia and Africa respectively). The women were recruited at 10-16 weeks gestation via pregnancy and birth magazines, online forums for expectant and new parents, as well as via word of mouth and community advertising, from various states of Australia. The women were aged between 19 and 44 years ($M = 30.92$ years, $SD = 4.27$). The majority of the women were married (77.0%), while 21.6% were in a de-facto relationship and 1.4% were single. Fifty-six percent of the participants were primiparous; with 10.7% of the women indicating that they required assistance conceiving their current pregnancy. At the commencement of the study, most of the women were in paid employment (78.8%); with 50.0% working full-time. An annual family income in excess of A$105,001 was reported by 62.9% of the women, 25.2% reported an income between A$65,001-105,000, and 11.9% reported an income below A$65,000.
Measures

Demographics Questionnaire. The Demographics Questionnaire obtained information regarding age, annual household income, parity status, ethnicity, employment and marital status.

Perinatal Depression. The Edinburgh Postnatal Depression Scale was used to assess levels of depressive symptomatology (EPDS; Cox, Holden & Sagovsky, 1987). The EPDS is a 10-item self report scale which assesses depressive symptoms experienced within the previous week. Responses to statements are scored on a 4-point Likert scale ranging from 0 to 3, with higher scores indicating increased frequency and intensity of depressive symptoms. The EPDS was initially developed for use with postnatal women and later validated for use with antenatal women also (Bergink et al., 2011), and has been extensively used with various populations.

Perinatal Anxiety and Stress. Perinatal anxiety and stress were assessed using the Anxiety and Stress subscales from the Depression, Anxiety and Stress Scales – short form (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 is a self-report scale with 7 items in each category of Depression, Anxiety and Stress symptoms, thus the 7 anxiety and 7 stress items were used in the present study. Responses are scored on a 4-point Likert scale (0 to 3), with elevated scores indicative of higher anxiety and stress levels. The DASS-21 is a widely used, standardised instrument found to reliably distinguish between the symptoms of depression, anxiety and stress in clinical as well as non-clinical samples (Anthony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005).

Self-esteem. The Rosenberg Self-Esteem Scale (RSE) assessed self-esteem (Rosenberg, 1965). The RSE is a 10-item self-report measure relating to overall feelings of
self-worth and self-acceptance. The items are scored on a 4-point scale ranging from 0 (Strongly Agree) to 3 (Strongly Disagree), with higher scores indicating higher levels of self-esteem. The RSE has been extensively used, with strong psychometric properties demonstrated (McCarthy & Hoge, 1982; Shahani, Dipboye, & Phillips, 1990).

**Marital/Relationship Quality.** The Dyadic Adjustment Scale (DAS: Spanier, 1976) was used to assess marital/relationship quality. The DAS has 32 items which form the four subscales of Dyadic Satisfaction, Dyadic Consensus, Dyadic Cohesion and Affectional Expression. Higher scores are indicative of greater level of relationship satisfaction/adjustment. The DAS has been widely used in previous studies with a variety of couples, and has demonstrated strong internal consistency (Spanier, 1976; 1979; Spanier & Thompson, 1982).

**Sleep Quality.** The Pittsburgh Sleep Quality Index (PSQI: Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) was used to measure sleep quality. Respondents rate their sleep habits and problems falling asleep over the past month on a 4-point Likert type scale ranging from 1 (Not during the past month) to 4 (Three or more times a week). Seven component scores are attained which are then summed to yield a global PSQI score, ranging from 0-21. Higher scores indicate worse sleep quality; a global score of 5 or greater represents moderate sleep difficulties.

**Social Support.** The Multidimensional Scale of Perceived Support (MSPS: Zimet, Dahlem, Zimet, & Farley, 1988) was used to measure perceived social support from family, friends and a significant other to yield a total perceived social support score. The MSPS consists of 12 items rated on a 7-point Likert type scale ranging from 1 (Very Strongly
Disagree) to 7 (Very Strongly Agree), with increased scores indicative of higher levels of support.

Significant Life Events. The Life Experiences Survey (LES: Sarason, Johnson, & Siegel, 1978) was used to measure significant life events occurring in the preceding 12 months. The LES includes 47 events that require adjustment (e.g., marriage, severe illness, job change). Respondents are asked to indicate whether the listed life events occurred during the previous 12 months and then rate their experience of each life event that has occurred on a 7-point scale ranging from -3 (extremely negative) to +3 (extremely positive). Every event that occurred is coded as one ‘life change unit’. These units are then summed to yield a total score of recent life events. Positive and negative events can be summed separately, as can be the total number of events.

General Coping. The COPE was used to assess general coping strategies (COPE; Carver, Scheier, & Weintraub, 1989). The COPE is a 60-item scale which assesses what individuals generally do and feel, when they experience stressful events. The time-limited version was used in the current study, as women were asked to indicate how often they used each strategy during the past month. Responses to statements are scored on a 4-point Likert-type scale ranging from 1 (I usually don’t do this at all) to 4 (I usually do this a lot), with higher scores indicating a greater tendency to use the given coping strategy in response to stressful events. Items are summed with responses forming a total of 15 subscales (each subscale is comprised of 4 items), namely: Positive Reinterpretation and Growth, Mental Disengagement, Focus on and Venting of Emotions, Use of Instrumental Social Support, Active Coping, Denial, Religious Coping, Humor, Behavioral Disengagement, Restraint, Use of Emotional Social Support, Substance Use, Acceptance, Suppression of
Competing Activities, and Planning. The COPE has been extensively used with a wide variety of populations, including perinatal women with strong reliability.

*Prenatal Specific Coping.* The Revised Prenatal Coping Inventory was used to assess pregnancy specific coping strategies (NuPCI; Hamilton & Lobel, 2008). The NuPCI is comprised of 32 items scored from 0 (never) to 4 (almost always). Items are summed with responses comprising three subscales: Planning-Preparation (15 items); Avoidance (11 items) and Spiritual-Positive (6 items) Coping. The NuPCI was developed specifically for the use within the antenatal period and has demonstrated strong internal consistency (Hamilton & Lobel, 2008).

*Cognitive Appraisal.* The Stress Appraisal Measure (SAM: Peacock & Wong, 1990) assessed women’s cognitive appraisal of pregnancy and the postpartum period. The SAM consists of 28-items which are rated on a 5-point Likert type scale ranging from 1 (Not at All) to 5 (Extremely). Individuals rate how they feel about a specific stressful situation. In the current study women were asked to think about their pregnancy and their time since the birth as the potentially stressful situations, during the antenatal and postnatal time-points respectively. The SAM is comprised of seven subscales intended to measure an individual’s appraisal of events. The three primary subscales are: Threat, Challenge and Centrality. The three secondary appraisal subscales measure the individual’s appraisal of available coping resources, namely: Controllable-by-self, Controllable-by-others, and Uncontrollable-by-anyone. Finally, a general subscale of Perceived Stressfulness is also obtained.
Procedure

Following university ethics approval and written informed consent from participants, women were mailed the questionnaire packs, with reply paid envelopes. Participants completed questionnaires at 16 weeks and 32 weeks gestation, and again at 3 and 12 months postpartum. Preliminary data screening indicated that 18 women had largely incomplete data, as only the first time-point had been completed (16 weeks gestation) and were therefore excluded from all analyses. This resulted in an antenatal sample of 283 women. Mean depressive, anxiety and stress scores at 16 weeks gestation did not differ for the women included in the current study, and those not included (n=18; p>.05).

During the postpartum (PP) phase of the study attrition rates increased, as would be expected. Ten women did not return any postpartum time-points, and a further 15 women only completed one postpartum time-point. Following all data screening the final sample size for the two postpartum time-points were: 3 months PP: N=249; and 12 months PP: N=152. Mean depressive, anxiety and stress scores at 3 months postpartum did not differ for the women who went on to complete the 12 months postpartum time-point, and those that did not (n=97; p>.05).

Results

Data Analysis

The results reported here forth are based on the 4 study time-points as follows: Time 1 (T1): 16 weeks gestation ($M = 16.54$ weeks, $SD = 0.94$); Time 2 (T2): 32 weeks gestation ($M = 32.61$ weeks, $SD = 0.82$); Time 3 (T3): 3 months postpartum ($M = 13.31$ weeks, $SD = 1.76$); and Time 4 (T): 12 months postpartum ($M = 52.51$ weeks, $SD = 1.53$).
Prior to any analyses being conducted, the appropriate transformations were applied to the DASS Anxiety subscale, the COPE Religion and the COPE Substance Use subscales at all time-points in order to address skewness. Square root transformations were applied to the DASS-Anxiety subscale and LOG transformations were applied to the COPE-Religion subscale. Following the transformations, these variables were normally distributed. The COPE-Substance Use subscale was the only variable to be excluded, as it remained skewed even after all transformations were tested. Given that this measure assessed substance use in the current sample of perinatal women the severe skewness was not surprising. Transformed variables are included in all the relevant analyses; however the means and standard deviations reported throughout the paper are based on the original non-transformed variables. Study variables were also assessed for assumptions regarding multicollinearity, linearity and singularity. All of these assumptions were met.

Factors Predicting Perinatal Distress

Based on the current sample size, there was sufficient power to allow 20 variables of interest to be included in the regression analyses (alpha=.05, power =.80) when investigating distress at 32 weeks gestation (n =283), and at 3 months postpartum (n =249); and 12 variables when investigating distress at 12 months postpartum (n = 152). This decision was made based on the formula of $N > 50 + 8m$, where $N =$ number of participants, and $m =$ number of variables (Tabachnick & Fidell, 2007). Bivariate correlations were conducted in order to examine the associations among the socio-demographic covariates (education level, family income and parity status/number of children), the maternal psychosocial factors (initial levels of depression, anxiety and stress; self-esteem, social support, sleep quality, marital/relationship quality, significant life events), the key
predictors (coping strategies and cognitive appraisal) and the outcome variables (later depression, anxiety and stress).

Correlations between the distress variables (depression, anxiety and stress) and the covariates did not all reach significance, however these factors were still controlled for in the regression analyses, as previous studies have shown that these socio-economic factors can influence distress levels (e.g., Milgrom et al., 2008). For the variable relating to marital/relationship quality and key variables of interest, namely coping strategies and cognitive appraisal, the subscales demonstrating the strongest correlations were selected from each measure. This decision was made for two main reasons: i) not all subscales were significantly associated with the outcome variables, and ii) to preserve statistical power.

This resulted in the following subscales being included: Dyadic Satisfaction at T2, T3 and T4 (Marital Quality measure), Avoidance at T2 (Pregnancy-specific Coping), Emotional Support, Mental Disengagement, Planning and Growth/Positive Reinterpretation at T2, T3, and T4, (General Coping), and Appraisal of Threat and as Uncontrollable-by-Anyone at T2, T3 and T4 (Cognitive Appraisal). Tables 1-3 show the correlations between the predictor variables included in the regression analyses and depression anxiety and stress at 32wks gestation, 3 months and 12 months postpartum respectively. Means and standard deviations and Cronbach’s alpha for internal consistency are also included.
Table 1
Associations among Study Variables at 32 Weeks Gestation.

<table>
<thead>
<tr>
<th>Study Variable</th>
<th>M (SD)</th>
<th>Alpha</th>
<th>Depression 32 Wks r</th>
<th>Anxiety 32 Wks r</th>
<th>Stress 32 Wks r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Education</td>
<td>-</td>
<td>-</td>
<td>-1.31*</td>
<td>-0.046</td>
<td>-0.063</td>
</tr>
<tr>
<td>Family Income</td>
<td>-</td>
<td>-</td>
<td>-0.008</td>
<td>-0.009</td>
<td>-0.004</td>
</tr>
<tr>
<td>Number of Children</td>
<td>-</td>
<td>-</td>
<td>0.053</td>
<td>0.014</td>
<td>0.141*</td>
</tr>
<tr>
<td>Depression-T1</td>
<td>4.85 (3.54)</td>
<td>.81</td>
<td>0.664**</td>
<td>0.273**</td>
<td>0.470***</td>
</tr>
<tr>
<td>Anxiety-T1</td>
<td>3.73 (4.22)</td>
<td>.63</td>
<td>0.306**</td>
<td>0.454**</td>
<td>0.330**</td>
</tr>
<tr>
<td>Stress-T1</td>
<td>9.29 (5.79)</td>
<td>.78</td>
<td>0.442**</td>
<td>0.322**</td>
<td>0.548**</td>
</tr>
<tr>
<td>Depression-T2</td>
<td>5.35 (4.03)</td>
<td>.77</td>
<td>-</td>
<td>0.420**</td>
<td>0.626**</td>
</tr>
<tr>
<td>Anxiety-T2</td>
<td>3.64 (3.95)</td>
<td>.70</td>
<td>0.420**</td>
<td>-</td>
<td>0.532**</td>
</tr>
<tr>
<td>Stress-T2</td>
<td>9.27 (6.02)</td>
<td>.82</td>
<td>0.626**</td>
<td>0.532**</td>
<td>-</td>
</tr>
<tr>
<td>Self-Esteem-T2</td>
<td>23.20 (4.51)</td>
<td>.89</td>
<td>-0.594**</td>
<td>-0.369**</td>
<td>-0.436**</td>
</tr>
<tr>
<td>Social Support-T2</td>
<td>23.24 (4.59)</td>
<td>.91</td>
<td>-0.292**</td>
<td>-0.182**</td>
<td>-0.245**</td>
</tr>
<tr>
<td>Sleep Quality-T2</td>
<td>7.18 (3.00)</td>
<td>.71</td>
<td>0.285**</td>
<td>0.339**</td>
<td>0.350**</td>
</tr>
<tr>
<td>Dyadic Satisfaction-T2</td>
<td>42.07 (4.22)</td>
<td>.82</td>
<td>-0.353**</td>
<td>-0.214**</td>
<td>-0.315**</td>
</tr>
<tr>
<td>Life Events Score-T2</td>
<td>3.25 (5.32)</td>
<td>-</td>
<td>-0.389**</td>
<td>-0.110</td>
<td>-0.322**</td>
</tr>
<tr>
<td>PCI: Avoidance-T2</td>
<td>12.24 (5.47)</td>
<td>.76</td>
<td>0.574**</td>
<td>0.423**</td>
<td>0.472**</td>
</tr>
<tr>
<td>COPE: Growth-T2</td>
<td>10.77 (2.20)</td>
<td>.79</td>
<td>-0.293**</td>
<td>-0.024</td>
<td>-0.155**</td>
</tr>
<tr>
<td>COPE: Disengagement-T2</td>
<td>7.89 (1.93)</td>
<td>.60</td>
<td>0.237**</td>
<td>0.246**</td>
<td>0.215**</td>
</tr>
<tr>
<td>COPE: Emotional Support-T2</td>
<td>11.14 (2.60)</td>
<td>.85</td>
<td>-0.208**</td>
<td>-0.275**</td>
<td>-0.273**</td>
</tr>
<tr>
<td>COPE: Planning-T2</td>
<td>11.22 (2.39)</td>
<td>.84</td>
<td>-0.222**</td>
<td>-0.045*</td>
<td>-0.194**</td>
</tr>
<tr>
<td>SAM: Threat-T2</td>
<td>1.61 (0.54)</td>
<td>.77</td>
<td>0.445**</td>
<td>0.312**</td>
<td>0.356**</td>
</tr>
<tr>
<td>SAM: Uncontrollable-T2</td>
<td>1.54 (0.58)</td>
<td>.63</td>
<td>0.149*</td>
<td>0.187**</td>
<td>0.210**</td>
</tr>
</tbody>
</table>

Note: ** = p<.01; * = p<.05; T1 = 16 weeks gestation; T2 = 32 weeks gestation; n=283
Table 2

**Associations Among Study Variables at 3 Months Postpartum.**

<table>
<thead>
<tr>
<th>Study Variable</th>
<th>M (SD)</th>
<th>Alpha α</th>
<th>Depression 3M PP r</th>
<th>Anxiety 3M PP r</th>
<th>Stress 3M PP r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Education</td>
<td>-</td>
<td>-</td>
<td>.003</td>
<td>.006</td>
<td>.087</td>
</tr>
<tr>
<td>Family Income</td>
<td>-</td>
<td>-</td>
<td>-.004</td>
<td>.055</td>
<td>.009</td>
</tr>
<tr>
<td>Number of Children</td>
<td>-</td>
<td>-</td>
<td>.079</td>
<td>-.011</td>
<td>.109</td>
</tr>
<tr>
<td>Depression-T2</td>
<td>5.35 (4.03)</td>
<td>.77</td>
<td>.447**</td>
<td>.293**</td>
<td>.360**</td>
</tr>
<tr>
<td>Anxiety-T2</td>
<td>3.64 (3.95)</td>
<td>.70</td>
<td>.297**</td>
<td>.147*</td>
<td>.251**</td>
</tr>
<tr>
<td>Stress-T2</td>
<td>9.27 (6.02)</td>
<td>.82</td>
<td>.415**</td>
<td>.312**</td>
<td>.469**</td>
</tr>
<tr>
<td>Depression-T3</td>
<td>6.06 (4.26)</td>
<td>.86</td>
<td>-</td>
<td>.539**</td>
<td>.736**</td>
</tr>
<tr>
<td>Anxiety-T3</td>
<td>1.77 (2.17)</td>
<td>.61</td>
<td>.539**</td>
<td>-</td>
<td>.645**</td>
</tr>
<tr>
<td>Stress-T3</td>
<td>10.54 (7.47)</td>
<td>.88</td>
<td>.736**</td>
<td>.645**</td>
<td>-</td>
</tr>
<tr>
<td>Self-Esteem-T3</td>
<td>22.48 (4.58)</td>
<td>.87</td>
<td>-.304**</td>
<td>-.222**</td>
<td>-.252**</td>
</tr>
<tr>
<td>Social Support-T3</td>
<td>72.83 (8.23)</td>
<td>.92</td>
<td>-.363**</td>
<td>-.357**</td>
<td>-.347**</td>
</tr>
<tr>
<td>Sleep Quality-T3</td>
<td>6.81 (2.64)</td>
<td>.67</td>
<td>.466**</td>
<td>.386**</td>
<td>.431**</td>
</tr>
<tr>
<td>Dyadic Satisfaction-T3</td>
<td>40.33 (4.48)</td>
<td>.88</td>
<td>-.405**</td>
<td>-.387**</td>
<td>-.469**</td>
</tr>
<tr>
<td>Life Events Score-T2</td>
<td>3.25 (5.32)</td>
<td>-</td>
<td>-.173**</td>
<td>-.154*</td>
<td>-.161*</td>
</tr>
<tr>
<td>PCI: Avoidance-T2</td>
<td>12.24 (5.47)</td>
<td>.76</td>
<td>.299**</td>
<td>.225**</td>
<td>.308**</td>
</tr>
<tr>
<td>COPE: Growth-T3</td>
<td>10.55 (2.45)</td>
<td>.67</td>
<td>-.254**</td>
<td>-.175**</td>
<td>-.251**</td>
</tr>
<tr>
<td>COPE: Disengagement-T3</td>
<td>7.79 (1.73)</td>
<td>.46</td>
<td>.266**</td>
<td>.217*</td>
<td>.282**</td>
</tr>
<tr>
<td>COPE: Emotional Support-T3</td>
<td>11.24 (2.33)</td>
<td>.84</td>
<td>-.199**</td>
<td>-.139*</td>
<td>-.234**</td>
</tr>
<tr>
<td>COPE: Planning-T3</td>
<td>11.12 (2.74)</td>
<td>.88</td>
<td>-.295**</td>
<td>-.128*</td>
<td>-.209**</td>
</tr>
<tr>
<td>SAM: Threat-T3</td>
<td>1.67 (0.61)</td>
<td>.80</td>
<td>.627**</td>
<td>.479**</td>
<td>.601**</td>
</tr>
<tr>
<td>SAM: Uncontrollable-T3</td>
<td>1.53 (0.63)</td>
<td>.70</td>
<td>.386**</td>
<td>.462**</td>
<td>.435**</td>
</tr>
</tbody>
</table>

**Note:** ** = p<.01; * = p<.05; T2 = 32 weeks gestation; T3 = 3 months postpartum; n=249
### Table 3

**Associations among Study Variables at 12 Months Postpartum.**

<table>
<thead>
<tr>
<th>Study Variable</th>
<th>M (SD)</th>
<th>Alpha</th>
<th>Depression 12M PP r</th>
<th>Anxiety 12M PP r</th>
<th>Stress 12M PP r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression-T3</td>
<td>6.06 (4.26)</td>
<td>.86</td>
<td>.490**</td>
<td>.333**</td>
<td>.541**</td>
</tr>
<tr>
<td>Anxiety-T3</td>
<td>1.77 (2.17)</td>
<td>.61</td>
<td>.331**</td>
<td>.306**</td>
<td>.354**</td>
</tr>
<tr>
<td>Stress-T3</td>
<td>10.54 (7.47)</td>
<td>.88</td>
<td>.433**</td>
<td>.309**</td>
<td>.476**</td>
</tr>
<tr>
<td>Depression-T4</td>
<td>4.35 (3.97)</td>
<td>.84</td>
<td>-</td>
<td>.659**</td>
<td>.714**</td>
</tr>
<tr>
<td>Anxiety-T4</td>
<td>1.81 (2.23)</td>
<td>.64</td>
<td>.659**</td>
<td>-</td>
<td>.615**</td>
</tr>
<tr>
<td>Stress-T4</td>
<td>9.08 (7.42)</td>
<td>.85</td>
<td>.714**</td>
<td>.615**</td>
<td>-</td>
</tr>
<tr>
<td>DAS: Satisfaction-T4</td>
<td>8.38 (2.17)</td>
<td>.77</td>
<td>-.214**</td>
<td>-.185*</td>
<td>-.257**</td>
</tr>
<tr>
<td>Sleep Quality-T4</td>
<td>6.04 (3.21)</td>
<td>.73</td>
<td>.379**</td>
<td>.253**</td>
<td>.413**</td>
</tr>
<tr>
<td>Life Events Total Score-T4</td>
<td>-0.46 (6.19)</td>
<td>-</td>
<td>-.413**</td>
<td>-.132*</td>
<td>-.237**</td>
</tr>
<tr>
<td>COPE: Growth- T4</td>
<td>11.23 (2.41)</td>
<td>.83</td>
<td>-.165*</td>
<td>-.183*</td>
<td>-.199*</td>
</tr>
<tr>
<td>COPE: Disengagement-T4</td>
<td>7.64 (1.94)</td>
<td>.48</td>
<td>.242**</td>
<td>.123</td>
<td>.261**</td>
</tr>
<tr>
<td>COPE: Emotional Support T4</td>
<td>11.34 (2.67)</td>
<td>.89</td>
<td>-.226**</td>
<td>-.104*</td>
<td>.084</td>
</tr>
<tr>
<td>COPE: Planning- T4</td>
<td>11.50 (2.50)</td>
<td>.87</td>
<td>-.221**</td>
<td>-.086</td>
<td>-.156*</td>
</tr>
<tr>
<td>SAM: Threat-T4</td>
<td>1.57 (0.62)</td>
<td>.83</td>
<td>.376**</td>
<td>.209</td>
<td>.267**</td>
</tr>
<tr>
<td>SAM: Uncontrollable-T4</td>
<td>1.43 (0.61)</td>
<td>.77</td>
<td>.309**</td>
<td>.156*</td>
<td>.299**</td>
</tr>
</tbody>
</table>

**Note:** **= p<.01; * = p<.05; T3 = 3 months postpartum; T4 = 12 months postpartum; n=152.

A total of nine separate hierarchical regressions were conducted in order to investigate which factors would demonstrate a unique contribution to the prediction of depression, anxiety and stress at 32 weeks gestation, 3 months postpartum, and 12 months postpartum respectively.
Factors Predicting Distress at 32 Weeks Gestation (Late Pregnancy)

For the antenatal regression models, covariates were entered in the first step of the regression (Step 1), initial levels of depression, anxiety and stress were entered in the second step of the regression (Step 2), current levels of depression, anxiety and stress, along with self-esteem, social support, sleep quality, marital quality, and total life events score were entered in the third step of the regression (Step 3). In Step 4, the key coping strategies (pregnancy-specific avoidance, use of emotional support, disengagement, planning and growth), and cognitive appraisal (threat appraisal and uncontrollable) were entered, to assess whether they would add any unique contribution, over and above that expected to be revealed from the more established factors entered in the previous steps.

Depression levels in Late Pregnancy

The regression model explained 64.2% of the total variance in depression scores (refer to the Table 4). Step 1 accounted for 2% ($p > .05$) of the variance with none of the covariates being significant predictors. Step 2 added 42.8% ($p < .001$) to the model, with initial depression level emerging as a significant predictor. Step 3 explained a further 18.7%, ($p = .000$) with current stress, self-esteem, and total life events score being significant predictors. The addition of the coping and appraisal measures in Step four added a further 3.2% to the prediction ($p<.01$), with pregnancy-specific Avoidance, and Growth/Positive Reinterpretation being unique predictors.

Anxiety levels in Late Pregnancy

The model explained 45.3% of the total variance (refer to Table 4). Step 1 accounted for 0.2% ($p > .05$) of the variance with no demographic covariates having a significant effect. Step 2 explained a further 22.1% ($p < .001$), with initial anxiety levels being a significant
predictor. Step 3 explained a further 21.9%, \((p<.001)\) with current stress, self-esteem, sleep quality, and total life events score emerging as significant predictors. Step 4 added a further 5.1% to the prediction \((p<.01)\), with pregnancy-specific Avoidance and use of Emotional Support both providing a unique contribution.

**Stress levels in Late Pregnancy**

The regression model explained 55.6% of the total variance (refer to Table 4). Step 1 accounted for only 2.4% \((p > .05)\) of the variance, however parity status (number of children) did yield a significant effect \((p < .05)\). Step two added 32.6% \((p < .001)\) to the model, with initial depression and stress levels emerging as significant predictors. Step 3 explained a further 22.6%, \((p < .001)\) with current depression and anxiety being significant predictors. The addition of Step 4 added a mere 1.3% to the prediction \((p>.05)\), with none of the coping and appraisal predictors adding any unique contribution. Table 4 provides a summary of the antenatal regression models and results.
Table 4
Hierarchical Regression Models Predicting Depression, Anxiety and Stress at 32 Weeks Gestation.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Maternal Distress: 32 Weeks Gestation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardised Beta</td>
</tr>
<tr>
<td></td>
<td>Depression</td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td>$\Delta R^2 = .02$</td>
</tr>
<tr>
<td>Maternal Education</td>
<td>-.14</td>
</tr>
<tr>
<td>Family Income</td>
<td>.05</td>
</tr>
<tr>
<td>Number of Children</td>
<td>.04</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>$\Delta R^2 = .43^{***}$</td>
</tr>
<tr>
<td>Depression-T1</td>
<td>.62^{**}</td>
</tr>
<tr>
<td>Anxiety-T1</td>
<td>.04</td>
</tr>
<tr>
<td>Stress-T1</td>
<td>.03</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>$\Delta R^2 = .19^{***}$</td>
</tr>
<tr>
<td>Depression-T2</td>
<td>n/a</td>
</tr>
<tr>
<td>Anxiety-T2</td>
<td>.09</td>
</tr>
<tr>
<td>Stress-T2</td>
<td><strong>.33^{</strong>*}**</td>
</tr>
<tr>
<td>Self-Esteem-T2</td>
<td>-.20^{***}</td>
</tr>
<tr>
<td>Social Support-T2</td>
<td>.02</td>
</tr>
<tr>
<td>Sleep Quality-T2</td>
<td>-.03</td>
</tr>
<tr>
<td>Dyadic Satisfaction-T2</td>
<td>-.09</td>
</tr>
<tr>
<td>Life Events Score-T2</td>
<td>-.09*</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>$\Delta R^2 = .03^{**}$</td>
</tr>
<tr>
<td>PCI: Avoidance-T2</td>
<td><strong>.13^{</strong>}**</td>
</tr>
<tr>
<td>COPE: Emotional Support-T2</td>
<td>.08</td>
</tr>
<tr>
<td>COPE: Disengagement-T2</td>
<td>.05</td>
</tr>
<tr>
<td>COPE: Planning-T2</td>
<td>.08</td>
</tr>
<tr>
<td>COPE: Growth-T2</td>
<td>-.10*</td>
</tr>
<tr>
<td>SAM: Threat-T2</td>
<td>.08</td>
</tr>
<tr>
<td>SAM: Uncontrol-T2</td>
<td>.07</td>
</tr>
</tbody>
</table>

*Note:* *p<.05, **p<.01, ***p<.0005; T1 = 16 weeks gestation; T2 = 32 weeks gestation; Cases were excluded pairwise; n = 283.
In the first postnatal regression model (3 months postpartum), the covariates were again entered in the first step of the regression (Step 1). Earlier levels of depression, anxiety and stress at Late Pregnancy were then entered in the second step of the regression (Step 2). Current levels of depression, anxiety and stress, along with self-esteem, social support, sleep quality, marital satisfaction and life events score were then entered in the third step of the regression (Step 3). In Step 4, the key coping strategies (pregnancy-specific avoidance, use of emotional support, disengagement, planning and growth), and cognitive appraisal (threat and uncontrollable appraisal) were entered, to assess whether they would add any unique contribution.

Factors Predicting Distress at 3 Months Postpartum (Early Postpartum)

Depression levels in Early Postpartum

The regression model explained 65.7% of the total variance (refer to Table 5). Step 1 accounted for 0.07% ($p > .05$) of the variance with none of the covariates being significant predictors. Step two added 23.2% ($p < .001$), with earlier depression and stress levels emerging as significant predictors. Step 3 added a further 40.3%, ($p < .001$) with current stress, self-esteem and sleep quality being significant predictors. Step 4 added a further 4.3% to the prediction ($p < .001$), with use of planning and threat appraisal being unique step four predictors.

Anxiety levels in Early Postpartum

The regression model accounted for 47.7% of the total variance (refer to Table 5). Step 1 accounted for 0.03% ($p > .05$) with no significant predictors. Step 2 added 11.7% ($p < .001$), with depression and stress levels in late pregnancy being significant predictors. Step 3 added a further 35.6% to the prediction, ($p < .001$) with current stress levels emerging as
the significant predictor. Step 4 added a further 4.4% to the model (p<.05), with uncontrollable appraisal, and use of disengagement being the unique step four predictors.

*Stress levels in Early Postpartum*

The regression model accounted for 67.5% of the total variance (refer to Table 5). Step 1 accounted for 2.3% (p > .05) of the variance with no significant predictors noted. Step 2 added 22.5% (p < .001), with earlier stress levels being a significant predictor. Step 3 added a further 43.4% to the prediction, (p < .000) with current depression, anxiety and marital satisfaction being significant step three predictors. Step 4 added a further 2.0% to the prediction (p<.05), with use of Disengagement emerging as the sole unique predictor. Table 5 provides a summary of the early postpartum (3 months postpartum) regression models and results.
Table 5
Hierarchical Regression Models Predicting Depression, Anxiety and Stress at 3 Months Postpartum.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Depression</th>
<th>Anxiety</th>
<th>Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>$\Delta R^2 = .01$</td>
<td>$\Delta R^2 = .01$</td>
<td>$\Delta R^2 = .02$</td>
</tr>
<tr>
<td>Maternal Education</td>
<td>.01</td>
<td>-.01</td>
<td>.11</td>
</tr>
<tr>
<td>Family Income</td>
<td>.01</td>
<td>.06</td>
<td>.01</td>
</tr>
<tr>
<td>Number of Children</td>
<td>.08</td>
<td>.00</td>
<td>.13</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>$\Delta R^2 = .23^{***}$</td>
<td>$\Delta R^2 = .12^{***}$</td>
<td>$\Delta R^2 = .22^{***}$</td>
</tr>
<tr>
<td>Depression-T2</td>
<td>.31^{***}</td>
<td>.17*</td>
<td>.14</td>
</tr>
<tr>
<td>Anxiety-T2</td>
<td>.07</td>
<td>.05</td>
<td>.01</td>
</tr>
<tr>
<td>Stress-T2</td>
<td>.18*</td>
<td>.24**</td>
<td>.39***</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>$\Delta R^2 = .40^{****}$</td>
<td>$\Delta R^2 = .36^{***}$</td>
<td>$\Delta R^2 = .43^{***}$</td>
</tr>
<tr>
<td>Depression-T3</td>
<td>n/a</td>
<td>.08</td>
<td>.44***</td>
</tr>
<tr>
<td>Anxiety-T3</td>
<td>.05</td>
<td>n/a</td>
<td>.31***</td>
</tr>
<tr>
<td>Stress-T3</td>
<td>.50^{***}</td>
<td>.51^{***}</td>
<td>n/a</td>
</tr>
<tr>
<td>Self-Esteem-T3</td>
<td>-.21^{***}</td>
<td>.07</td>
<td>-.06</td>
</tr>
<tr>
<td>Social Support-T3</td>
<td>.01</td>
<td>-.12</td>
<td>.05</td>
</tr>
<tr>
<td>Sleep Quality-T3</td>
<td>.13**</td>
<td>.10</td>
<td>.03</td>
</tr>
<tr>
<td>Dyadic Satisfaction-T3</td>
<td>-.05</td>
<td>-.07</td>
<td>-.13**</td>
</tr>
<tr>
<td>Life Events Score-T2</td>
<td>.01</td>
<td>-.07</td>
<td>.02</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>$\Delta R^2 = .04^{****}$</td>
<td>$\Delta R^2 = .04^{**}$</td>
<td>$\Delta R^2 = .02^*$</td>
</tr>
<tr>
<td>PCI: Avoidance-T2</td>
<td>.06</td>
<td>.04</td>
<td>.04</td>
</tr>
<tr>
<td>COPE: Disengagement-T3</td>
<td>.01</td>
<td>.12*</td>
<td>.09*</td>
</tr>
<tr>
<td>COPE: Growth-T3</td>
<td>.04</td>
<td>.03</td>
<td>-.03</td>
</tr>
<tr>
<td>COPE: Emotional Support-T3</td>
<td>.05</td>
<td>.04</td>
<td>-.05</td>
</tr>
<tr>
<td>COPE: Planning-T3</td>
<td>-.12*</td>
<td>-.03</td>
<td>.08</td>
</tr>
<tr>
<td>SAM: Threat-T3</td>
<td>.26^{***}</td>
<td>.05</td>
<td>.09</td>
</tr>
<tr>
<td>SAM: Uncontrollable-T3</td>
<td>.07</td>
<td>.24^{***}</td>
<td>.04</td>
</tr>
</tbody>
</table>

Note: *p<.05, **p<.01, ***p<.0005; T2 = 32 weeks gestation; T3 = 3 months postpartum; Cases were excluded pairwise; n = 249.
In the second postnatal regression model (12 months postpartum), there was sufficient power for the inclusion of 12 variables given the reduced sample size. Thus, in an effort to preserve statistical power the socio-demographic covariates were omitted given they had little or no effects in any of the previous regression models. Instead distress levels for the relevant variable at 3 months postpartum were entered in the first step of the regression (Step 1). Current levels of depression, anxiety and stress were then entered in the second step of the regression (Step 2). Current sleep quality, marital satisfaction and total life events score were then entered in the third step of the regression (Step 3). In Step 4, the key coping strategies (use of emotional support, disengagement, planning and growth), and cognitive appraisal (threat and uncontrollable) were entered.

Factors Predicting Distress at 12 Months Postpartum (Late Postpartum)

Depression levels in Late Postpartum

The regression model accounted for 66.0% of the total variance (refer to Table 6). Step 1 accounted for 24.0% \((p < .001)\) of the variance with earlier depression levels at 3 months being a significant predictor. Step 2 added 36.2% \((p < .001)\) to the prediction, with current anxiety and stress levels both emerging as significant predictors. Step 3 added 6.5% to the model \((p < .001)\), with life events score being a significant predictor. The final step added a further 2.1% to the variance \((p<.05)\), with use of Growth/Positive Reinterpretation providing a unique contribution.

Anxiety levels in Late Postpartum

The regression model accounted for 47.0% of the total variance (refer to Table 6). Step 1 accounted for 9.4% \((p < .001)\) of the variance, with earlier anxiety levels at 3 months making a significant contribution. Step 2 added 38.6% to the prediction, \((p < .001)\) with
current depression and stress levels both emerging as significant predictors. Step 3 did not significantly add to the model with only 2.2% added to the prediction, \( p > .05 \) and no unique contributors. Similarly, the final step again did not significantly add to the variance, with only 1.1% added to the prediction \( p > .05 \), and no significant predictors.

**Stress levels in Late Postpartum**

The regression model accounted for 57.8% of the total variance (refer to Table 6). Step 1 accounted for 22.7% \( p < .001 \) of the variance, with earlier stress levels at 3 months being a significant predictor. Step 2 contributed a further 35.2% to the prediction, \( p < .001 \) with current depression and anxiety levels both being significant predictors. Step 3 added a 2.3% to the prediction, \( p > .05 \) with sleep quality making some unique contribution. Step 4 once again did not significantly add to the variance, as only 1.1% was added to the prediction \( p > .05 \), with no significant step four predictors. Table 6 summarises the late postpartum (12 months PP) regression models.
**Table 6**  
*Hierarchical Regression Models Predicting Depression, Anxiety and Stress at 12 Months Postpartum.*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\Delta R^2 = .24^{***}$</td>
<td>$\Delta R^2 = .36^{***}$</td>
<td>$\Delta R^2 = .06^{***}$</td>
<td>$\Delta R^2 = .02^{*}$</td>
</tr>
<tr>
<td></td>
<td>$\Delta R^2 = .09^{***}$</td>
<td>$\Delta R^2 = .38^{***}$</td>
<td>$\Delta R^2 = .02$</td>
<td>$\Delta R^2 = .01$</td>
</tr>
<tr>
<td></td>
<td>$\Delta R^2 = .23^{***}$</td>
<td>$\Delta R^2 = .35^{***}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression-T3</td>
<td>.49^{***}</td>
<td>n/a</td>
<td></td>
<td>-.14*</td>
</tr>
<tr>
<td>Anxiety-T3</td>
<td>n/a</td>
<td>.44^{***}</td>
<td></td>
<td>.06</td>
</tr>
<tr>
<td>Stress-T3</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
<td>.06</td>
</tr>
</tbody>
</table>

Note: *p<.05, **p<.01, ***p<.0005; T3 = 3 months postpartum; T4 = 12 months postpartum; Cases were excluded pairwise; n = 152.

**Discussion**

The aim of the present study was to examine the role of cognitive appraisal and coping strategies in the development of perinatal depression, anxiety and stress, after controlling for the effects of established risk factors. At 32 weeks gestation, engaging in
pregnancy specific Avoidance independently predicted increases in concurrent depression and anxiety levels. Decreased use of Growth/Positive Reinterpretation also predicted depression, while decreased use of Emotional Support predicted anxiety at 32 weeks gestation. During the early postpartum (3 months post-birth), decreased use of Planning predicted increased depression symptoms, while use of Disengagement predicted higher anxiety and stress levels at 3 months post birth. Higher Threat appraisal also predicted increased depression levels, while higher Uncontrollable appraisal predicted increased anxiety levels at 3 months postpartum. At 12 months post birth, only decreased use of Growth/Positive Reinterpretation independently predicted increased depression symptoms.

The current results extend the findings of our previous research (Rallis et al., 2015) in further suggesting that the coping strategies employed by women may have an important role to play in the development and/or maintenance of both antenatal and postnatal distress, over and above the effects of well established factors (e.g., marital quality, social support). Different coping strategies impacted on symptoms of distress in a different manner, which also differed across time, even after key psychosocial variables had been controlled for. Pregnancy-specific Avoidance was again shown to be a particularly important coping strategy, as it predicted both depression and anxiety antenatally; results that are in accordance with those previously obtained by Da Costa et al., (2000), George et al., (2003), and Yali and Lobel, (1999).

Use of Mental Disengagement was also shown to be an important predictor as increased use of this coping strategy was related to higher anxiety and stress at 3 months post-birth. Attempting to disengage from a situation is arguably similar to use of
avoidance, thus indicating a possible target for clinical interventions. For example, women who try and manage the demands of the perinatal period by essentially ignoring or detaching themselves from situations and specific sources of stress may benefit from understanding how such coping is being counterproductive, and are likely to benefit from alternative strategies. For instance, encouraging women to identify opportunities where a more helpful and balanced thought process can be brought into play may be useful, as not only would this be incompatible with mental disengagement, but would arguably increase the use of Positive Reinterpretation/Growth strategies. In turn, use of Positive Reinterpretation/Growth strategies may potentially buffer against the development or maintenance of depression as current results demonstrated that this particular coping strategy emerged as a significant predictor during pregnancy and at 12 months postpartum, with increased use of this strategy uniquely contributing to lower depression symptoms. The current results extend previous findings which have demonstrated that higher positive reappraisal is associated with fewer depressive symptoms during pregnancy (Pakenham et al., 2007), by revealing that a similar relationship may also exist post-birth. Use of Planning and Emotional Support as a means of coping also emerged as important coping strategies for depression and anxiety respectively, indicating that use of such proactive strategies may also help buffer against the development of distress, and are again strategies that can be targeted in interventions.

The influence of cognitive appraisal, and in particular a sense of ‘threat’ and of an ‘uncontrollable’ situation, appears be pertinent but only during the postpartum. Thus, our findings are somewhat in contrast to those previously demonstrated by Pakenham, Smith and Rattan (2007) where higher threat appraisal was associated with increased depressive
symptoms during pregnancy. Current results suggest that the arrival and presence of the infant and the associated demands is what translates to a feeling that the situation is ‘threatening’ and not within one’s control (i.e., uncontrollable by anyone). These cognitive appraisal factors emerged as significant predictors at 3 months postpartum, with a higher threat appraisal contributing to increased depression levels, and a higher sense of an uncontrollable situation contributing to increased anxiety.

From a theoretical perspective, the present findings emphasise the impact that a perception of threat can have, as well as one’s perceived ability to cope and exert influence on the stressful situation, thus supporting the transactional stress model (Lazarus & Folkman, 1984). With this framework in mind it is not surprising that when the women in the current study appraised their situation as ‘threatening’ and as ‘uncontrollable-by-anyone’ in the postpartum, increased emotional reactivity then occurred. Cognitive appraisals of threat are often associated with an evaluation that the situation will have a negative impact on the well-being of the individual, while secondary appraisals involve an assessment of the personal resources required for effectively dealing with the situational demands (Lazarus, 1991; Smith & Lazarus, 1993). Thus, an appraisal which involves a perceived lack of control over the situation (i.e., “It is not within my control to effectively cope with this stressful situation”) may also be associated with an evaluation that the situation will have a negative impact, and result in emotional distress (Lazarus & Folkman, 1984). Perception of threat and loss of control may thus be key underlying factors that need to be explored and addressed, and in turn present a clear target for intervention.

By 12 months postpartum, coping and cognitive appraisal measures appear to have a minimal direct impact on the experience of depression, anxiety and stress. It is likely that
by 12 months post birth women have 'learned' to deal with the demands of the infant and hence feel that the situation is less threatening and that they are more in control. In the current study, only decreased use of Growth/Positive Reinterpretation uniquely predicted depression at 12 months. These results suggest that while coping and appraisal measures may have a key role to play in the development of distress antenatally and earlier on in the postpartum, other factors become more salient by the end of the first year post birth. This may include the demands and stress associated with women returning to work by this time, and other related factors such as managing childcare arrangements, chronic sleep disturbances, or concerns about the infant’s development.

Collectively, the present findings indicate that cognitive appraisal and coping strategies predict different distress symptoms at different times. This is of particular interest as it again highlights that conceptualising coping in a dichotomous manner, (i.e., as either helpful or unhelpful), or limiting the scope of emotional distress may be hindering our understanding of a rather complex processes, by oversimplifying the issue and the mechanisms at play. For example, if depression was the only distress measure in the current study, use of Disengagement and/or Emotional Support would not have emerged as significant predictors. However, the inclusion of anxiety and stress allowed for the importance of Disengagement and Emotional Support to be recognised as unique predictors of anxiety and stress. Similarly, assessing the relationships during both pregnancy and the postpartum also allows one to recognise that different factors can have a different impact at different times. If the current study was limited to the antenatal period, no cognitive appraisal measures would have emerged as significant factors. In turn, it may be tempting to draw the inference that if cognitive appraisal measures are not
significant antenatally, that they may not be relevant post-birth. Current results indicate that this is clearly not the case, as appraisal factors were indeed significant predictors of distress postnatally.

The present findings support Matthey’s et al. (2000) argument that the transition to parenthood is likely to be related to different variables at different times. Given that this is the first study to explore cognitive appraisal and coping strategies as unique predictors of depression, anxiety and stress symptoms, across both pregnancy and the postpartum period, further research examining the role of appraisal and coping strategies and how their impact may differ across the spectrum of distress symptoms and disorders is needed.

Conclusion

Examining the impact that women’s cognitive appraisal and coping strategies have during pregnancy and the postpartum appears to be useful in better understanding the development and/or maintenance of maternal distress, after accounting for the effects of earlier distress levels and well established risk factors. While the majority of women in the current study were well functioning and were not experiencing clinical levels of depression and anxiety, the present findings indicate that it is worthwhile for health professionals to consider how women’s appraisal of their situation and the coping strategies that they are employing to manage the demands may be impacting on their emotional health. The effectiveness of treatment programs may also be improved if the impact of different appraisal and coping strategies is better understood and incorporated in management plans. Conducting the current study with a more diverse and clinical sample is needed to assist in better understanding the clinical significance of the present findings, and whether different trends may emerge in the presence of more
complex presentations. A broader framework that incorporates other parenting and infant specific factors that may be impacting on women’s distress and/or patterns of appraisal and coping is also warranted.

Two main limitations need to be acknowledged in regards to the current study. These include the fact that all data was collected via self-report measures, as well as the fact that the participant sample primarily consisted of married, tertiary educated women, thus limiting the generalisability of the current findings. Despite these limitations, the present findings indicate that the coping strategies used by women during pregnancy and the postpartum period can have a significant influence on depression, anxiety and to a lesser extent stress, even after for the effects of well researched and established factors have been accounted for. Cognitive appraisal measures also appear to play a role in the experience of depression and anxiety symptoms during the early postpartum, with women who perceive the situation as more threatening and uncontrollable, experiencing higher levels of depression and anxiety respectively.

Given the relatively few studies that have specifically examined the influence of coping and cognitive appraisal on emotional distress symptoms during the perinatal period, future research is needed to better understand the patterns in play at different times; and to better understand the impact of these processes, both independently and in conjunction with known psychosocial risk factors. Collectively, the current results highlight the complex and important relationships that are likely to exist between cognitive appraisal, coping strategies and emotional distress, and hence provide a basis for future studies to further explore these relationships. Present findings indicate the likely benefit of incorporating and addressing women’s cognitive appraisal and ways of coping in clinical
treatment. If the current patterns continue to be replicated in future studies, it may allow key health professionals such as midwives, maternal and child health nurses and GP’s to better identify which expectant and new mothers are at increased risk of emotional distress across the entire perinatal period. Improved screening and identification will clearly enhance early intervention and treatment programs and ideally reduce the duration and impact that maternal distress has on the mother herself, her family, while also potentially reducing treatment and associated costs.

Acknowledgements: We extend our thanks and appreciation to the women who participated in this research.
References:


Chapter 7

Summary and General Discussion

Summary of the findings

Study One was a discussion piece which posed the question as to whether the term perinatal distress accurately captures the range of emotional experiences that occur during the perinatal period, when the scope of distress is limited to the presence of depression and anxiety alone. The aim of Study One was to review the perinatal literature and identify the studies that have focused on the experience of stress as a distinct affective state. This review highlighted the lack of consistency in which the concept of stress has previously been defined and assessed. The limited findings available to date have demonstrated that stress can be experienced both in conjunction with and independent of depression and anxiety. These findings seem to indicate that including stress as a separate affective state is likely to be helpful when researching and conceptualizing perinatal distress as it may allow for a better understanding of the experiences that occur during the transition to motherhood. Whether stress differs from depression and/or anxiety; and/or plays a critical role in the development of such other affective states needs to be further investigated.

The aim of Study Two was to attain a comprehensive trajectory of depression, anxiety and stress symptoms throughout pregnancy, by exploring these experiences on a monthly basis, while also investigating the prospective relationships between these symptoms. Symptoms of depression, anxiety and stress were all shown to change over the course of pregnancy, with women experiencing significantly fewer symptoms during the middle of their pregnancy, at approximately 24 weeks gestation. Distress symptoms earlier in pregnancy strongly predicted higher symptom levels throughout the rest of the gestational period.
Elevated symptoms of depression in early pregnancy were shown to be particularly pertinent, as they predicted higher depression symptoms, as well as increased anxiety and stress later in pregnancy.

The aim of Study Three was to explore the types of coping strategies used by women across the perinatal period using both a pregnancy-specific and general coping measure; and to also explore the prospective and concurrent relationships between coping and symptoms of depression, anxiety and stress. The results revealed that the most frequently used pregnancy-specific coping strategy was Planning-Preparation, with Religious coping being the least frequently used strategy. Accessing Emotional Support, Instrumental Social Support, and engaging in Planning and Positive Reinterpretation were the most frequently used general coping strategies. Earlier coping strongly predicted later coping, during the antenatal and postnatal periods, and a range of coping strategies predicted higher depressive, anxiety and stress levels later in pregnancy, and post-birth. Pregnancy-specific Avoidance was the most consistent predictor of distress. Distress levels were then shown to influence the coping strategies women used to manage the demands at the time, thus indicating the presence of a bi-directional relationship.

The aim of Study Four was to explore the role of cognitive appraisal and coping strategies in the development of depression, anxiety and stress, after controlling for the effects of well established risk factors, both during pregnancy and following birth. Results from this study indicated that specific cognitive appraisal measures were shown to play a role in the experience of depression and anxiety symptoms, but only during the early postpartum; with women who perceived their situation as more threatening and uncontrollable by anyone, experiencing higher levels of depression and anxiety respectively. The impact of coping
strategies was more extensive, given that the coping strategies used by women had a significant impact on depression, anxiety and to a lesser extent stress, during pregnancy and the postpartum period, even after accounting for effects of known risk factors (self-esteem, marital/relationship quality, sleep quality, social support and significant life events).

Collectively these studies highlight that symptoms of depression, anxiety and stress can and do fluctuate over time thus highlighting the importance of assessing maternal mental health over an extended period of time. Adopting a broader conceptualisation of maternal distress, to include depression, anxiety and stress during the perinatal period also appears to be warranted. Screening and treatment programs are likely to benefit from the inclusion of maternal and psychosocial factors, with particular consideration given to cognitive appraisal and coping strategies. The current findings provide a basis for future studies to further explore these relationships.

Theoretical considerations of the findings

Study One: A broader conceptualisation of perinatal distress.

Study One summarised the findings of past research which have investigated a broader concept of maternal distress, by assessing not just depression and/or anxiety, but also maternal stress and distress. This review highlighted the largely inconsistent manner in which the term stress has been used and assessed, thus making it difficult to compare the findings of the different studies, and in turn draw meaningful conclusions. This no doubt impedes the goal of better understanding these factors.

Although limited, the results from previous studies assessing stress as a distinct affective state were summarised, which indicated that stress symptoms appear to be present throughout the entire first postpartum year for some women (Miller, Pallant & Negri, 2006). A particular gap
in the antenatal literature was identified, as it was evident that (prior to Study Two of this
program of research), there had been few studies investigating the point prevalence of stress,
with a reliable measure that distinguishes symptoms of stress from anxiety and depression
during pregnancy. Research into the contributing factors for maternal stress was also notably
lacking and there appeared to be a need to understand the mechanisms in regards to depression
and anxiety, and whether a cycle of co-morbidity exists for stress and depression and/or stress
and anxiety, and the associated risk factors. The importance of frequent time-points, clear
definitions, and prospective studies was highlighted, in order to attain a more sophisticated
understanding of perinatal distress for both theoretical and clinical reasons. Given the regular
contact that women tend to have with midwives, GP’s, obstetricians, and other health agencies
during the antenatal and postnatal period, the perinatal period provides health professionals
with a unique opportunity to screen and assess for maternal distress.

Collectively, Study One suggested that adopting a broader concept of perinatal distress,
defined as the presence of depression, anxiety and/or stress may provide an improved and more
accurate representation of the range of experiences women encounter across the perinatal
period. This study also highlighted the need for large prospective studies to explore whether the
experience of stress, and the underlying mechanisms, differs to the experience of depression
and in particular anxiety.

*Study Two: Changes in distress symptoms across the antenatal period.*

The results from Study Two demonstrated that there were significant changes in
distress symptoms over the course of pregnancy, with notable peaks observed at 16 weeks
gestation and again at 32-36 weeks gestation. Results indicated that levels of depression,
anxiety and stress all differed over the course of pregnancy, thus strengthening the concept
of antenatal distress being a multidimensional construct. Past research has not previously assessed symptoms of distress at monthly intervals during pregnancy, and thus the findings of this study cannot be directly compared to any results previously obtained. Having said that, the finding that women’s symptoms of distress were relatively elevated at 16 weeks gestation, and again later during the third trimester at 32 and 36 weeks gestation are comparable to those obtained by (Benevicius, Kusminskas, Benevivius, Nadisauskiene, Jureniene, & Pop; 2009; Moss, Skouteris, Wertheim, Paxton & Milgrom 2009; Skouteris, Wertheim, Rallis, Paxton & Milgrom, 2009) which have revealed similar patterns.

While the third trimester of pregnancy has previously been identified as a time when symptoms of depression and anxiety are elevated, Study Two extends these results in a number of ways. Firstly, the present findings lend further support to the argument that mood disturbances and anxiety appears to increase at certain times (i.e., at 16 weeks and at 32-36 weeks gestation), but also highlight the point that symptoms of stress also exhibit a similar pattern. While researchers in more recent years have suggested that perinatal anxiety may be as prevalent, if not more, than depression (e.g., Howard, Piot, & Stein, 2014; Matthey, Barnett, Howie, & Kavanagh, 2003; Wenzel, Haugen, Jackson, & Robinson, 2003), the present findings indicate that perinatal stress may exhibit an even higher prevalence.

The finding that depression, anxiety and stress symptoms are first elevated at 16 weeks gestation is a relatively novel finding. It is possible that a number of physical and psychosocial factors influence the peaks found antenatally, including concern about the risk of miscarriage, dealing with physical symptoms typically associated with the first few months of pregnancy such as nausea, vomiting, and fatigue, while also trying to cope with the demands of continuing to work at the same time and/or care for other children. These
results remained significant even after parity status was controlled for, thus indicating that women appear to feel increasingly distressed during the first few months of pregnancy, up until the 16 week gestation mark, regardless of whether they are first-time mothers or not. This particular finding suggests that the emotional reactivity is not due to factors that are unique to the experience of becoming a parent for the first-time. More research is needed to replicate these findings, ideally with an even earlier time-point, and to assess what specific factors may be influencing this early increase in distress symptoms.

The trend for symptoms to increase later in pregnancy (32-36 weeks) may again be due to various physical and psychosocial variables, such as increased physical discomfort, increased concern and worry about the upcoming birth and recovery time, changes in occupational status, and on a more general level adjusting to the idea that motherhood, and all the changes associated with it, will soon be forthcoming. The finding that parity status was not associated with distress levels may also indicate that while the challenges and stressors faced by first-time mothers may be different to those who already have other children, there are various stressors that are relevant in both set of circumstances. For example past research has identified that issues pertaining to feelings of uncertainty about how to care for themselves and their infant, changes in lifestyle, and unclear role expectations may be more pertinent to first-time mothers; whereas multiparous women may feel more confident about responding to their infant’s cues and demands, but experience a greater loss of autonomy, and the need for a greater level of social support in light of having to care for multiple children (George, 2005; Salari, Nazari, Mazlom, Ghanbari, & Abadi, 2013; Wilkins, 2006). Given that early increases of depression, anxiety and stress may be a warning sign of growing distress, mindful monitoring by health professionals and
discussions about women’s emotional health throughout pregnancy is needed. The importance of continued monitoring is further highlighted by the findings in Study Two as women’s distress symptoms may not necessarily be heightened across the entire perinatal period, but rather may ‘peak’ at certain periods.

Prospective interrelationships between distress symptoms during pregnancy.

Study Two also explored the inter-relationships between depression, anxiety and stress across pregnancy, as well as the influence of perceived social support and sleep quality; two variables that have been shown to be associated with depression and anxiety in previous studies (Honey, Bennett, & Morgan, 2003; Milgrom et al., 2008; Skouteris, Germano, Wertheim, Paxton, & Milgrom, 2008). The results from this study indicated that depressive, anxiety and also stress symptoms demonstrated strong stability over time as increased symptoms earlier on in pregnancy, predicted higher symptoms at all later time points, consistent with findings on depression and anxiety previously obtained (Heron, O’Connor, Evans, Golding, & Glover, 2004; Moss et al., 2009; Skouteris et al., 2009). Study Two now extends these findings, by revealing that stress symptoms also appear to demonstrate the same stability model.

A relationship between depression and later anxiety stress was also found. Elevated depression symptoms earlier in pregnancy (16 weeks gestation) also predicted higher anxiety scores later in pregnancy (32 weeks gestation), even after social support and sleep quality were controlled for. These results coincide with those obtained by Skouteris et al. (2009) who found that depressive symptoms earlier in pregnancy predicted higher anxiety levels later in pregnancy. A similar pattern was demonstrated for stress symptoms, as increased depression levels early in pregnancy predicted higher stress symptoms later in
pregnancy. Furthermore, increased stress scores during mid pregnancy (24 weeks gestation) also predicted higher anxiety levels in late pregnancy. Both these relationships remained significant after controlling for the effects of social support and sleep quality. Given that this study is the first to explore the prospective interrelationship of stress symptoms, the current findings need to be replicated by future research in an effort to ascertain the importance of stress symptoms and whether their impact can be differentiated from that of depressive and anxiety symptoms. Depression can be described as an affective state that involves feeling ‘down’ or flat, most of the time, and/or a distinct loss of interest in activities that are usually enjoyable. Anxiety in contrast often involves a sense of fear that something terrible is going to happen, and is often associated with increased worry and rumination, apprehension, as well as somatic symptoms such as increased heart rate, shaking and difficulty breathing.

Stress in contrast may be best conceptualised as an experience where one feels overwhelmed and unable to cope, even when they are not necessarily experiencing the low mood or anhedonia of depression, or the fear response and somatic symptoms of anxiety. Thus, stress may predominantly be associated with a feeling of ‘being under pressure’ and struggling to deal with this pressure and/or demands. It is possible that if this is the underlying theme of stress, then it may assist in understanding why some women will identify as feeling overwhelmed and not like ‘their usual self’, yet experience limited depressive or anxiety symptoms (Coates, de Visser, & Ayers, 2015). Given the limited research on stress as a separate construct of emotional distress, it is vital that further research is conducted in this field to untangle the often blurred lines between depression, anxiety and stress, which will in turn have significant implications for treatment plans.
Collectively, the results from Study Two indicate that distress levels can and do fluctuate over the course of pregnancy, which in turn strengthens the argument that health professionals need to screen for and monitor women for both new and possibly recurring distress, over extended periods of time. Continued screening is indicated as it cannot be assumed for example, that women who are screened mid pregnancy and present with minimal symptoms, will continue to experience low levels of distress later on. These results support the argument that it is best to avoid classification of women as either ‘low risk’ or ‘at-risk’ based solely on a single presentation or assessment (Davies, Howells, & Jenkins, 2003; Stuart, Couser, Schilder, O’Hara & Gorman, 1998). Screening for depression in early pregnancy appears to be particularly pertinent, as it can not only predict later depression, anxiety and stress symptoms as shown in the current study, but has been shown to be one of the strongest predictors of postpartum depression (Faisal-Cury, & Menezes, 2012; Moss et al., 2009).

Of particular interest was the finding that there may be two periods of increased symptom severity during pregnancy, with the first one being at 16 weeks gestation, thus potentially providing a window of opportunity for early identification and intervention. The later time-point of 32-36 weeks gestation also provides an opportunity for intervention to begin prior to the arrival of the infant. If the current patterns continue to be replicated in future studies, an interesting area of for future research may be to also explore how many women at the later time in pregnancy present with ‘new’ cases of distress, as opposed to ‘recurring’ cases of distress, where women’s symptoms are not necessarily increasing for the first time, but rather are on the rise again.
Study Three: Types of Coping Strategies Used by Women during Pregnancy and Post Birth and Changes Over Time.

The results from Study Three demonstrated that Planning-Preparation was the most frequently used pregnancy-specific coping strategy, followed by Avoidance, with Spiritual coping being the least used strategy. When investigating the use of general coping strategies, Emotional Support, Planning, Instrumental Social Support, Positive Reinterpretation/Growth and Active Coping were all shown to be frequently used by women to deal with their current demands. Not surprisingly Substance Use was the least frequently used strategy, followed by Denial and Religious coping. To the author’s knowledge this is the first study to investigate women’s coping strategies during pregnancy and the postpartum period, using both a pregnancy-specific and general coping measure. In turn, the findings of this study are not able to be directly compared to the results from past research. While a direct comparison cannot be made, the current patterns do demonstrate some similarities with previous findings. For example, the results obtained in this study supported those previously obtained by (Guardino & Dunkel-Schetter, 2013; Hamilton & Lobel, 2008; Huizink, Robles de Medina, Mulder, Visser, & Buitelaar, 2002), where women were shown to use a multitude of coping strategies, as opposed to a limited set of strategies.

A somewhat novel finding from Study Three was that the type of certain coping strategies used most frequently by the women in the current study, differed to those reported in previous studies. Specifically, spiritual/religious coping has previously been shown to be the most frequently used strategy during pregnancy (e.g., Borcherding, 2009; Hamilton & Lobel, 2008), yet in the current study it was the least frequently used strategy. It is possible that these differences may be due to sociocultural issues, given that the previous studies have been conducted in
different countries, and thus indicate an avenue for future research. The current study also
extend previous findings by indicating that women typically employed coping strategies
generally considered to be adaptive and helpful in managing stressful situations (Carver, Scheier,
& Weintraub, 1989; Lazarus & Folkman, 1984; Littleton, Horsey, John, & Nelson, 2007) (e.g., use
of emotional support and planning), a pattern that was consistent across pregnancy and the
postpartum period. This particular pattern may be at least partly related to the fact that the
participant sample was generally well-functioning and well educated, thus again indicating the
importance of replicating this study with a more diverse sample.

Our findings further support the argument that women employ a broad range of strategies
during the perinatal period (Borcherding, 2009; George, Luz, De Tycheey, Thilly, & Spitz, 2013),
particularly while pregnant; and that coping is not a static process, but rather a dynamic process
that changes over time, in accordance with the situational demands (Lazarus, 1993). Frequency
in which coping strategies were utilised by women changed over time for some, but not all
strategies. Women appeared to engage in more Planning-Preparation coping later in pregnancy
(32 weeks gestation), however interestingly use of Avoidance also increased as women’s
pregnancies progressed. Use of Denial and Suppression strategies were at their lowest earlier in
pregnancy (16 weeks gestation), while use of Humour and Religious coping strategies were at
their highest at this time. During the postpartum period, the stability of coping strategies was
even greater, as differences emerged only for the Denial and Humour strategies, with women
engaging in these strategies more frequently at 12 months post-birth.

Prospective and concurrent relationships between coping strategies and distress symptoms

A strong stability model for coping was demonstrated when exploring the concurrent and
prospective relationships between coping strategies and distress symptoms, as use of each
coping strategy early in pregnancy predicted use of the coping strategy at later times, both antenatally and postnatally. Thus, the current results concur with those obtained by Yali and Lobel (2002) in that early coping predicts later coping during pregnancy, but also extend these previous findings by demonstrating a similar pattern during the postpartum period. Interestingly, while Yali and Lobel did not find any prospective relationships between coping and distress levels over time, the current study revealed numerous interrelationships between various coping strategies and distress symptoms at later time-points.

Women who engaged in more frequent Avoidant coping at 16 weeks gestation were shown to have higher depression and anxiety scores later in pregnancy, a relationship that remained significant even after earlier depression and anxiety levels were controlled for. In contrast, use of Avoidant coping did not predict stress symptoms later in pregnancy once the effect of earlier stress had been controlled for. Increased use of Avoidant coping at 32 weeks gestation also predicted increased depression, anxiety and stress levels at 3 months postpartum, and all relationships remained significant after earlier depression, anxiety and stress levels were controlled for. These findings are in agreement with those obtained by George et al. (2013) and Yali and Lobel (1999), where increased Avoidance was associated with greater distress during pregnancy; while also extending these previous findings by indicating a similar pattern post-birth. Interestingly, depression, anxiety and stress were all shown to predict concurrent use of Avoidance at 32 weeks gestation in the current study. This seems to suggest that there is likely to be a complex interplay of relationships between use of avoidant coping and emotional distress. It is possible that increased use of Avoidance may contribute to the development of later distress, which may then be associated with the continued use of Avoidance as a means of coping, thus perpetuating the cycle between Avoidance and distress.
From a theoretical perspective, if one considers Lazarus and Folkman’s (1984) transactional theory, emotional distress is said to be related to a perceived discrepancy between one’s perceived ability to cope given the resources available (Lazarus, 1993; Lazarus & Folkman, 1984). In turn, it is possible that women who engage in avoidant coping more frequently, may have a perception that the demands of their situation exceed their resources and capacity to cope, and that in turn there is no action worth taking or thinking about. Avoidant coping, or more specifically, avoidance of a stressful situation may manifest in the form of withdrawing from other people and situations, minimising or denying the existence of the stressor, and/or disengaging from one’s own thoughts and feelings associated with the stressor (Lazarus & Folkman, 1984; Littleton et al., 2007). It is important to note that use of avoidance may reduce distress in the short term, and hence it is understandable why women may be tempted to continue to cope in this manner. Given that continued use of avoidance is often associated with emotional distress, it may be this recurring use of avoidance that is particularly problematic (George et al., 2013; Lazarus, 1993). Intrinsically, it appears likely that increased use of Avoidance may also result in decreased use of other more helpful coping strategies that involve acknowledging and/or confronting the stressor, such as eliciting social support and/or engaging in problem solving or planning strategies (Min, Farkas, Minnes, & Singer, 2007; Schmidt, Holstein, Christensen, & Boivin, 2005). Thus, the true negative impact of Avoidance may be attributed to a number of interrelated factors such as: 1) it is likely that avoiding a situation will increase the likelihood of the stressor itself continuing to be present (i.e., by not making an effort to resolve or work through the issue), 2) use of continued Avoidance is likely to maintain and/or exacerbate emotional distress symptoms, and 3) Avoidance is likely to decrease the
likelihood that proactive and more adaptive strategies are employed, thus again compounding the effects of the stressor.

When exploring the impact of general coping strategies, use of Active Coping and Acceptance at 16 weeks gestation were shown to predict lower levels of depression later in pregnancy, while use of Instrumental Social Support and use of Emotional Support predicted lower levels of anxiety later in pregnancy. These relationships remained significant even when earlier depression and anxiety levels were controlled for respectively. Interestingly, numerous coping strategies earlier in pregnancy predicted lower levels of later antenatal stress, as increased use of Instrumental Social Support, Active Coping, Humour, Emotional Support, and Planning at 16 weeks gestation were all associated with lower levels of stress at 32 weeks gestation. It is possible that the use of these proactive coping strategies increase an individual’s level of resilience, which relates to one’s ability to embrace, adjust or even thrive in the context of change and challenging situations (Garcia-Dia, DiNapoli, Garcia-Ona, Jakubowski, & O’Flaherty, 2013), and can thus promote positive mental health.

Positive mental health is often argued to be the best way to minimise the risk and incidence of mental illness. This relates to more than the mere absence of distress symptoms and disorders; but also acknowledges the importance of understanding and promoting the factors and strategies that assist in enhancing emotional wellbeing throughout the perinatal period (Bowen, Harris & Zdunich, 2012). It is argued that strategies which enhance positive mental health should be part of every treatment and relapse prevention plan (Bowen et al., 2012). In turn, it is important that research and clinical efforts concentrate not just on the factors that contribute to maternal distress, but also on those that enhance emotional wellbeing and assist women in successfully dealing with the changes associated with the perinatal period. Thus
current findings indicate that strategies such as Planning, use of Emotional and Instrumental Social Support may be particularly pertinent in enhancing emotional wellbeing, and are in turn strategies that may improve the effectiveness of prevention and treatment programs.

*Is conceptualizing coping in a dichotomous manner useful?*

Behavioural Disengagement at 32 weeks gestation predicted depression levels at 3 months post-birth, while decreased use of Positive Reinterpretation/Growth and increased use of Focus on and Venting of Emotions predicted higher anxiety at 3 months postpartum. Both these relationships remained significant after the effects of earlier depression and anxiety had been accounted for. No general coping strategies at 32 weeks gestation were associated with stress symptoms at 3 months post-birth once earlier stress had been controlled for. The current results are of particular interest as they indicate that conceptualizing coping in a dichotomous manner, for example as either adaptive or maladaptive, or perhaps more importantly as either emotion-focused or problem-focused, may be impeding our understanding of the complex processes at play by oversimplifying the true and intricate nature of these constructs.

For example, both Positive Reinterpretation and Focusing on and Venting of Emotions are considered to be emotion-focused strategies. The results outlined in Study Three however indicate that these two emotion-focused strategies generated two very different effects. Specifically, engaging in Positive Reinterpretation *less* frequently yielded a similar outcome as did engaging in Focusing on and Venting of Emotions *more* frequently, namely increased anxiety. In turn, it appears that one is not able to suggest that emotion-focused coping is unhelpful or less desirable, as the effects appear to be unique to each particular coping strategy, and not whether they fall within the emotion-focused or problem-focused category. This use of a dichotomous conceptualization may also help explain the inconsistent findings previously
reported, where some studies have demonstrated that emotional wellbeing was associated to
the use emotion-focused strategies (e.g., Honey et al., 2003), while in other studies emotion-
focused coping was related to increased emotional distress (e.g., Faisal-Cury, Tedesco, Kahhale,
Menezes, & Zugaib, 2004; Yali and Lobel, 1999). It must be acknowledged that Folkman and
Lazarus (1988) have highlighted that the adaptive or maladaptive impact that a coping strategy
has is partially dependent on the context of the situation, regardless of whether it is problem or
emotion-focused. While this is certainly an important point to consider, the current studies
extend this argument by further suggesting that it is not only the context of the situation that is
relevant, but which particular coping strategies are being implemented. From a theoretical and
clinical perspective having a clear understanding of the concurrent relationships between
specific coping strategies and emotional distress is of particular importance, as how women cope
with depression, anxiety and stress may be important factors that need to be targeted in
treatment, and/or may indirectly impact on other key factors (e.g., by mediating the relationship
between emerging distress and accessing social support).

Maternal Distress as a Multidimensional Construct

The finding that different coping strategies had a different impact on depression, anxiety
and stress symptoms again seems to support the concept of maternal distress being a
multidimensional construct. This is particularly interesting when one considers that the coping
strategies that were associated with increased anxiety were not necessarily associated with
higher stress symptoms. While it is generally agreed upon that depression and anxiety relate to
two different affective states, the terms anxiety and stress have often been used
interchangeably, and at times have been considered to be part of the same experience. The
current patterns however seem to indicate a genuine difference between the constructs of
anxiety and stress as assessed in the current study, and that different coping strategies are associated with each class of symptoms, thus further indicating that it is likely to be useful to assess the two affective states separately.

When investigating the impact of distress on concurrent coping it was again interesting to find that while depression, anxiety and stress all predicted the concurrent use of various general coping strategies at 32 weeks gestation and again at 3 months postpartum, the patterns were different for each distress measure at each time. For example while women with higher depression scores at 32 weeks gestation appeared to engage in less Positive Reinterpretation and Growth coping at the same time, this pattern was not evident for women with higher anxiety or stress symptoms. Furthermore, the coping strategies that earlier on predicted later distress symptoms, were not always the same strategies that were associated with distress at the later time; i.e., while use of Acceptance at 16 weeks was significantly related to depression levels at 32 weeks, depression at 32 weeks was not significantly associated with use of Acceptance at 32 weeks. These patterns again seem to indicate the presence of a rather intricate set of interrelationships between coping and maternal distress, and not an absolute relationship between particular coping strategies and depression, anxiety and/or stress.

**Pregnancy Specific Coping**

The results from Study Three also highlighted that the PCI, a pregnancy specific coping measure yielded stronger relationships when assessing coping and distress symptoms, in comparison to the COPE, a general coping measure. In turn, it seems that coping measures which have been specifically designed for the antenatal and postnatal period add particular value to the assessment and potentially treatment of perinatal distress. A similar pattern may arguably also exist for other measures as well, not just those focused on assessing coping.
Perinatal specific measures may in turn allow researchers and clinicians alike to assess aspects specific to the perinatal context, which may be otherwise missed. Future research is no doubt needed to explore this further.

**Summary of Study Three**

Collectively, the results from Study Three indicate that different coping strategies appear to predict different distress symptoms at different times; and in turn different distress symptoms are associated with the concurrent use of a distinct set of coping strategies. A broader conceptualisation of maternal distress is again indicated, as is more specific assessment of coping in the perinatal period. Moreover, it appears that abandoning dichotomous classification systems of coping such as emotion-focused versus problem-focused, may help advance our understanding of the complex mechanisms in play by shifting our focus to the unique influence that specific coping strategies may have. Increased awareness of the particular coping strategies that either contribute to, or help protect against emotional distress is clearly important, as it may present an opportunity to identify women at increased risk of increased distress, or conversely may present a target for intervention. Consequently, it appears that future research which further explores the influence of a range of coping strategies during the perinatal period, across the spectrum of distress symptoms, at different times is warranted.

**Study Four: Examining the Role of Cognitive Appraisal and Coping Strategies as Unique Predictors of Perinatal Depression, Anxiety and Stress.**

Study Four sought to build on the findings from Study Two and Three by investigating the role of cognitive appraisal and coping strategies in development of perinatal depression, anxiety and stress, after accounting for the impact of well known risk factors. This study also sought to extend results previously obtained in a number of ways: 1) by examining the role of cognitive
appraisal and coping strategies, as opposed to just one or the other; 2) by exploring the key relationships during both the antenatal and postnatal period; and 3) by controlling for the effects of established risk factors such as social support and self-esteem, including earlier levels of depression, anxiety and stress, arguably the most consistent predictor of later distress.

The findings of this study revealed that women who engaged in pregnancy specific Avoidance more often at 32 weeks gestation, experienced higher depression and anxiety levels concurrently. Women who employed less Growth/Positive Reinterpretation strategies were also shown to experience increased depression, while decreased use of Emotional Support predicted anxiety at 32 weeks gestation. When examining the relationships during the early postpartum (3 months post-birth), decreased use of Planning predicted increased depression symptoms, while use of Disengagement predicted higher anxiety and stress levels at 3 months post birth. Women who appraised their situation as more threatening were also shown to have increased depression levels. Similarly, women who appraised their situation as increasingly uncontrollable-by-anyone experienced higher anxiety levels at 3 months postpartum. During the later postpartum period (12 months post birth), only decreased use of Growth/Positive Reinterpretation independently predicted increased depression symptoms. While the current results cannot be directly compared to any previous research, they are somewhat comparable to those obtained by Honey, Bennett, and Morgan (2003) where the addition of coping and appraisal processes improved the performance of the Predictive Index of PND (Cooper, Murray, Hooper, & West, 1996) at 6 weeks postpartum. Honey et al. (2003) argued that appraisal and coping processes may be particularly important to the development of postnatal depression and may thus have important implications for the prevention and treatment of this disorder; an argument that the current study lends further support to.
Coping by Avoidance and Disengagement

Consistent with theoretical expectations, Pregnancy-specific Avoidance was once again shown to be a particularly important coping strategy, as it predicted both depression and anxiety antenatally; results that are in agreement with those previously obtained by Da Costa et al. (2000), George et al., (2013), and Yali and Lobel, (1999). Use of Mental Disengagement was also shown to be an important predictor as women who used this coping strategy more frequently experienced higher anxiety and stress symptoms at 3 month post-birth. It seems feasible to suggest that attempting to mentally disengage from a situation is similar to use of avoidance, thus indicating a possible target for intervention. That is, women who try and manage the demands of the perinatal period by essentially ignoring or attempting to detach themselves from their situation and/or specific sources of stress may benefit from understanding how coping by avoidance is likely to be counterproductive, and may in fact be increasing their symptom severity. In turn, women are likely to benefit from learning how to engage in alternative strategies. For example, women may be encouraged to identify opportunities where a more helpful way of thinking can be adopted, and how this may be useful. Not only would this process be incompatible with mental disengagement, but would potentially increase the use of Positive Reinterpretation/Growth strategies.

Given that the current results demonstrated that increased use of this particular strategy uniquely contributed to lower depression symptoms during pregnancy and at 12 months postpartum, use of Positive Reinterpretation/Growth strategies may potentially buffer against the development or maintenance of depression. The current results extend previous findings which have demonstrated that higher positive reappraisal is associated with fewer depressive symptoms during pregnancy (Pakenham, Smith & Rattan, 2007), by revealing that a similar
relationship may also exist post-birth, and by demonstrating this relationship even after controlling for other key factors.

*Coping by Planning and accessing Emotional Support*

Use of Planning and Emotional Support as a means of coping also emerged as important coping strategies for depression and anxiety respectively, indicating that use of such proactive strategies may also help buffer against the development of distress, and are again strategies that can be targeted in interventions. The finding that use of Emotional Support as a way of coping is particularly interesting given that perceived level of social support was one of the key factors controlled for in this study. These results seem to concur with those of past research which have indicated that the quality of the support available to women is more important than the actual size of her social support network (Brugha et al., 1998; Fisher et al., 2002). The current results arguably extend this point by further highlighting that while the quality of the support available is no doubt crucial, whether women actively choose to access and utilise this support that is also of importance. Given that various aspects of social support have been implicated to the development of maternal distress, future research that investigates the factors that contribute to social support *utilisation* appears to be warranted.

*Perception of Threat and of an Uncontrollable Situation*

The findings from Study Four also revealed that the influence of cognitive appraisal, and in particular a perception of ‘threat’ and of an ‘uncontrollable’ situation, appears be pertinent but only during the postpartum. The current results are somewhat in contrast to those previously demonstrated by Pakenham, Smith and Rattan (2007) where higher threat appraisal was associated with increased depressive symptoms during pregnancy. Currents findings suggest that it is the arrival and presence of the infant and the associated demands that contributes to a
sense that the situation is ‘threatening’ and not within one’s control (i.e., uncontrollable by anyone). These cognitive appraisal factors emerged as significant predictors at 3 months postpartum, with a higher threat appraisal contributing to increased depression levels, and a higher sense of an uncontrollable situation contributing to increased anxiety. One possible explanation for these different findings is that while the Pakenham et al. study assessed the influence of some key psychosocial variables including age, income, education, and social support, earlier levels of depression (one of the most consistent predictors of later depression) were not assessed and in turn controlled for. Furthermore, other key variables included in the present study such as self-esteem, sleep quality and marital/relationship satisfaction were also not assessed. Given that these variables have repeatedly been shown to be important predictors of depression, it seems feasible to suggest that not accounting for the effects of these variables would increase the likelihood of appraisal strategies emerging as significant predictors. While it is important to consider both the direct and indirect effects that appraisal and coping strategies may have, further investigations into the unique impact of these factors are likely to be more meaningful if the effects of key risk factors have been accounted for.

By 12 months postpartum the direct impact of coping and cognitive appraisal measures on symptoms of depression, anxiety and stress appears to be minimal. It is possible that by 12 months post birth women have adjusted to their role as a mother and the uncertainty that may be present in earlier months, and/or they may have ‘learned’ to deal with the demands of the infant and hence feel that the situation is less threatening, and possess a greater sense of control. In the current study, only decreased use of Growth/Positive Reinterpretation uniquely predicted depression at 12 months post-birth. These results suggest that while coping and appraisal measures may have a key role to play in the development of distress antenatally and
earlier on in the postpartum, other factors become more salient towards the end of the first postpartum year. It is possible that at this later time the demands and stress associated with women perhaps returning to work, and other related factors such as managing childcare arrangements, persistent sleep disturbances, concerns about the infant’s development, or possibly being pregnant again exert more of an influence on levels of distress.

Collectively, the findings from Study Four indicate that cognitive appraisal and coping strategies may be important predictors of different distress symptoms at different times during the perinatal period. This is of particular interest as it again highlights that conceptualising coping in a dichotomous manner, (i.e., as either helpful or unhelpful), or limiting the scope of emotional distress may be hindering our understanding of a rather complex processes, by oversimplifying the issue and the mechanisms at play. For example, if depression was the only distress measure in the current study, use of Disengagement and/or Emotional Support would not have emerged as significant predictors. However, the inclusion of anxiety and stress allowed for the importance of Disengagement and Emotional Support to be recognised as unique predictors of anxiety and stress. Similarly, assessing the relationships pre and post birth also highlights that coping and appraisal factors have a different impact on distress symptoms at different times. For example, if the current study was limited to the antenatal period, no cognitive appraisal measures would have emerged as significant predictors. Thus, it may be tempting to draw the inference that if cognitive appraisal measures are not significant during the antenatal period, that they may not be relevant during the postpartum either. Current results indicate that this is clearly not the case, as appraisal factors were indeed significant predictors of distress postnatally, thus again indicating the need for research and clinical attention to focus on the entire perinatal period.
Maternal Distress and the Interplay of Biopsychosocial Factors

The present findings lend further support to bio-psychosocial model and more specifically the argument that the transition to parenthood is likely to be related to different variables at different times (Matthey et al., 2000; Milgrom, Martin & Negri, 1999). Given that this is the first study to explore cognitive appraisal and coping strategies as unique predictors of depression, anxiety and stress symptoms, across both pregnancy and the postpartum, further research examining the role of appraisal and coping strategies and how their impact may differ across the spectrum of distress symptoms and disorders is needed.

From a theoretical perspective, the findings of Study Four emphasise the impact that one’s perception of threat can have, as well as a perceived lack of control over a stressful situation, thus supporting the transactional stress model (Lazarus & Folkman, 1984). With this framework in mind, the finding that women who appraised their situation as increasingly ‘threatening’ and as ‘uncontrollable-by-anyone’ in the postpartum experienced increased emotional reactivity, is not surprising. Cognitive appraisals of threat are often associated with an evaluation that the situation will have a negative impact on the well-being of the individual, while secondary appraisals involve an assessment about the personal resources required to effectively deal with the situational demands (Lazarus, 1991; Smith & Lazarus, 1993). In turn, an appraisal which involves a perceived lack of control over a given situation (i.e., “It is not within my control to effectively cope or exert influence on this stressful situation”) may also be associated with an evaluation that the situation will result in a negative outcome, including increased emotional distress (Lazarus & Folkman, 1984). Exploring issues related to a sense of threat and loss of control may thus be key underlying factors that need to be investigated and considered, and in turn present a clear target for intervention.
The results obtained from Study Four, and to a lesser extent, Study Three, also support the bio-psychosocial framework (Milgrom et al., 1999) in regards to the development of emotional distress. That is, cognitive appraisal and coping factors were shown to be associated with, and at times were unique predictors of depression, anxiety and stress, in addition to the notable effects of a range of psychosocial variables, thereby indicating that maternal distress during the perinatal period is due to a wide range of factors. Both the transactional model of stress and the biopsychosocial model recognise that maternal distress occurs within a broad context, thus suggesting the presence of various bidirectional relationships. The conceptual model proposed in this thesis (please refer to Figure 1, page 33 Introduction chapter) also contributes to the relevance and applicability of the biopsychosocial and transaction models in regards to the development of perinatal distress.

Past and current findings indicate that models of distress need to be multifactorial, whereby a range of factors need to be taken into account. Furthermore, the impact of these variables at different stages of pregnancy and the postpartum period need to be considered, as current results indicate that the relevance of specific factors may be stronger at some time points, compared to others. For example, the influence of physical factors such as fatigue, sleep quality and nausea may be greater earlier in pregnancy, while the impact of relationship discord or significant life events may be more relevant later in pregnancy, or after the arrival of the infant. In turn, understanding not only what factors contribute to depression, anxiety and stress during the pre and postnatal period, but also when and how they impact, will further enhance our current knowledge of maternal wellbeing during this critical time in a woman’s life.
Summary of Study Four

In summary, the findings from Study Four extend the findings of Study 3 in further suggesting that the coping strategies employed by women may have an important role to play in the development and/or maintenance of both antenatal and postnatal distress, even after the effects of well established factors (e.g., marital quality, social support) have been accounted for. The current findings contribute to the knowledge base of the specific coping and cognitive appraisal mechanisms that may be most relevant to perinatal distress and at what time-points. The influence of these strategies appear to be relevant even after accounting for the effects of earlier distress levels and well established risk factors. In turn, it appears worthwhile for both researchers and clinicians to consider how women's appraisal of their situation and the coping strategies that they are employing to manage the demands may have a role to play on their health and wellbeing. The effectiveness of treatment programs may also be enhanced if the effect of different appraisal and coping strategies is better understood and potentially incorporated in management plans. Replication of this study with a more diverse sample is no doubt needed, in an effort to ascertain the significance of the present findings.

General Limitations and Avenues for Future Research

A number of limitations need to be acknowledged and considered when drawing inferences from the results of the present empirical studies. The first limitation refers to the absence of other contributing factors that might be associated with the development of perinatal depression, anxiety and stress. For example, while Study Two controlled for the effects of social support and sleep quality when investigating the trajectory and interrelationships between depression, anxiety and stress symptoms, other psychosocial factors such as relationship quality, or indeed the possible influence of physical symptoms during pregnancy
were not controlled for. Study Three controlled for earlier levels of depression, anxiety and stress when investigating the concurrent and prospective relationships between coping strategies and maternal distress, but no other factors. Data from additional variables was available, however given that the influence of each coping strategy as assessed by the COPE and PCI was explored (18 strategies in total), the scope and already complex nature of this study did not allow for any further variables to be included. Future studies may choose to use the findings of this study as a basis for future investigations, by limiting for example the number of specific strategies assessed to those previously shown to be the most salient, thus allowing the addition of other variables to be incorporated into the study design.

Study Four arguably employed the most sophisticated study design, as a number of key risk factors were controlled for, when exploring the role of appraisal and coping strategies in the development of maternal distress. While data from additional variables were again available, the sample size did not allow for any further variables to be included without compromising the statistical power of the analyses. Furthermore, Study Four did not consider the role of specific infant related factors such as infant temperament, or infant sleeping and feeding difficulties which may impact on distress, (Coates, Ayers, & de Visser, 2014; Hiscock, Bayer, Hampton, Ukoumunne, & Wake, 2008; Hiscock et al., 2014) when investigating the possible pathways and mechanisms in which cognitive appraisal and coping strategies may be linked to maternal distress. For example, it is possible that feeding and in particular sleeping difficulties may influence a woman’s perception as to how threatening and uncontrollable her current situation is, and/or trigger feelings of inadequacy as a mother. Conversely, mothers of infants who sleep and feed well may also be less likely to use unhelpful coping strategies such as avoidance and
disengagement, as they may not feel the need to distance themselves in any manner. Such possible pathways are yet to be investigated.

In addition to the possible role of infant related factors, a further limitation of the current studies is that the role of paternal emotional distress on the development and course of maternal depression, anxiety and stress was not assessed. Recent studies have shown that paternal mental health is likely to influence a mother’s emotional state, which in turn can impact on infant and child wellbeing (Fletcher, Freeman, Garfield, & Vimpani, 2011). The impact of father’s mental health on child outcomes is in addition to and distinct from that of mothers (Fletcher et al., 2011). It has thus been recommended that future research consider the role of mothers and fathers in an effort to better understand the complex relationships between parent’s emotional distress and the associated consequences (Fletcher, Matthey, & Marley, 2006). Given that the influence of fathers’ emotional health was not assessed in the current studies, it is possible that incorporating such variables in future research will allow for a more accurate understanding of the trajectory and impact that paternal mental health has, both independently and in conjunction with maternal distress. Such information will allow for specialised interventions to be developed and applied, whereby targeted support for fathers in distressed families is introduced, which may have a buffering effect against the detrimental consequences of untreated depression (Fletcher, 2009).

The influence of specific socio-cultural and familial factors noted in the biopsychosocial model (Milgrom et al., 1999), were also not incorporated into the current studies. While it would be almost impossible to account for all the factors listed in the model, there are some variables that may be beneficial to include in future studies. The biopsychosocial framework proposes that socio-cultural factors such as beliefs, perceptions, values, attitudes, practices, and past family
experiences, all play a role in the development of depression (Milgrom et al., 1999). Therefore cultural and familial factors such as gender role expectations, norms regarding what ‘typical’ parenting practices are, and ways of interacting with infants, may also influence a mother’s emotional state and wellbeing. It would thus be interesting to have future research extend the current study design by specifically assessing and accounting for the possible impact of these socio-cultural factors.

A further methodological limitation of Study Two, Three and Four pertains to the generalisability of the findings obtained. This issue becomes salient when one considers the fact that the majority of women partaking in the current studies reported an annual household income indicative of a mid to high socioeconomic status. Furthermore, the women were predominately well-educated, were married or partnered, and had an Australian background. These factors may have influenced the findings given that being in a committed relationship and/or having a certain level of financial security may potentially buffer against, or reduce the incidence of maternal distress. Furthermore, the majority of the women were generally well functioning and were not experiencing clinical levels of depression, anxiety and/or stress. These sample characteristics thus make it difficult to generalise the current study findings to women from more diverse backgrounds or with a more complex psychosocial presentation. In turn, it is possible that the results obtained in the current empirical studies are idiosyncratic to the current participant sample, and may not necessarily apply to women from different cultural backgrounds, women from a low socioeconomic background, women who do not have a partner, and/or women who are experiencing clinical levels of psychopathology. Future research which replicates the current study design with a more diverse participant sample is needed to ascertain whether any of these factors exert a strong influence on maternal distress.
The final limitation of the current empirical studies relates to the fact that all data was collected via self-reported measures. While such measures are generally convenient and easy to administer, it is difficult to ascertain whether responses were entirely accurate or whether social desirability biased the data in some way. Future research may benefit from the inclusion of objective measures and/or qualitative methods to complement the information obtained from self-report measures, particularly for the key variables of depression, anxiety and stress. Given the time, resource and financial constraints often associated with longitudinal studies, if the inclusion of objective measures is not possible for the entire participant sample, introducing these measures to a smaller subgroup of participants may be more feasible. Objective measures may include the use of diagnostic clinical interviews and/or assessments, in an effort to corroborate the symptoms and experiences reported by the women. This would also allow a woman’s affective state to be observed, where visible signs of emotional distress such as tearfulness, agitation, trembling hands, or difficulty concentrating may be observed. The use of such objective measures will be particularly relevant to future studies who seek to replicate the current findings with clinical samples, given that for any clinical diagnosis to occur and be reliable, a thorough assessment is required which will often include information obtained directly from the woman, as well as clinical judgment.

Despite these limitations, the current studies demonstrate the changing course of distress symptoms during pregnancy, which thus appear to be akin to the patterns previously reported in the postpartum literature. The important role that appraisal and coping strategies may have in the development and/or maintenance of maternal distress is also indicated, thus contributing to the relatively limited knowledge base in these areas of importance.
Conclusions and Practical Implications

One of the broader and arguably most important aims of well designed research studies is to inform researchers and clinicians as to how the findings obtained can be applied to ‘real world’ situations and benefit the target populations. Most often, this refers to designing new treatment and/or preventative programs, or modifying current practice, so that the latest research findings can be incorporated in an effort to enhance their efficacy. From a health promotion and treatment perspective, the effectiveness of prevention and intervention programs is at least partly dependent on the accurate identification of modifiable precipitating and/or maintaining factors. Thus, it is important to focus on and enhance our understanding of the factors that may be amenable to change, and may present a clear target of intervention.

The majority of treatment programs to date have largely focused on depression as the principal marker of maternal distress, with the focus for many years predominantly being on the postpartum period. A shift towards recognising the importance of anxiety has notably been made in more recent years. The review conducted in Study One summarised the previous studies that have extended their scope of focus to beyond that of depression and/or anxiety alone, by also assessing maternal stress. The limited findings of past research which have assessed maternal stress as a distinct affective state were summarised, which indicated that stress symptoms appear to be present throughout the entire first postpartum year for some women.

Understanding how the experience of perinatal stress differs from that of perinatal depression and/or anxiety, and knowing the precursors and effects of stress during the perinatal period has important implications particularly from a treatment perspective. For example, if the affective state of stress is shown to correspond closely to a woman’s sense of feeling overwhelmed or a perceived inability to cope, this experience may be a significant precursor of
depression and anxiety. If this is the case, treating this stress in the context of clinical depression and/or anxiety is likely to require specialized assessment and treatment planning, just as co-morbid depression and anxiety require different treatment strategies from the treatment of depression or anxiety alone. Thus, the presence of significant stress may have significant implications for the strategies adopted by health professionals and for the resources necessary to support the treatment of this condition. Alternatively, if stress symptoms are part of a normative continuum associated with the transition to motherhood, promoting access to various psychosocial supports, such as increased partner and family support, may be more appropriate and provide the best outcome rather than clinical intervention.

Study One suggested that adopting a broader concept of perinatal distress, defined as the presence of depression, anxiety and/or stress, may enhance our understanding of the range of emotional states and challenges that women experience during the perinatal period. It seems feasible to suggest that further research investigating perinatal stress as a distinct affective state is warranted, in an effort to understand if and how the experience of stress differs to that of depression and in particular anxiety. Given the lack of consistency in how maternal stress and distress have previously been conceptualised and measured, working towards developing a consensus for the definition and assessment of these key constructs is essential, so that researchers and clinicians alike can be in agreement as to what emotional state or experience they are referring to, when discussing or examining the course and impact of maternal stress and distress.

Study Two sought to address some of the key issues highlighted in the Study One review, and extend previous findings, by adopting the broader conceptualization of perinatal distress and investigating the trajectory of distress symptoms throughout pregnancy. Consistent with
past research, the Study Two results demonstrated that symptoms of depression, anxiety and stress did indeed change over the course of pregnancy, and that early antenatal depressive, anxiety and stress symptoms predicted later symptoms. Symptoms of distress were all relatively elevated during the initial time-point at approximately 16 weeks gestation, and again later in pregnancy at 32-36 weeks gestation (Benevicius et al., 2009; Moss et al., 2009; Skouteris et al., 2009).

These results strengthen the argument that a broader conceptualisation of maternal distress may be useful in better understanding the range of affective states experienced by women during the perinatal period. This argument is further reinforced by the findings obtained in a recent qualitative study where women often described a lack of identification with the concept of postnatal depression, and expressed a need to have other forms of emotional distress recognised (Coates et al., 2015). Coates, de Visser and Ayers (2015) argued that identification of both symptoms and disorders other than depression need to be improved, as does an awareness of multiple types of emotional distress. In turn, it was suggested that a range of symptoms need to be assessed, so that appropriate supports can be mobilized; a point that the current findings clearly support.

Considering these recent findings, along with those from the current empirical studies, it seems feasible to suggest that if depression is to be the sole point of focus when assessing maternal distress, women who are experiencing anxiety and stress will arguably be overlooked and consequently are likely to go by undetected and untreated; or at the very least may not receive the most appropriate treatment (Miller et al., 2006). It has often been argued that specialised intervention plans are needed so that the co-morbid affective states and the range of women’s needs are all adequately addressed during treatment (Coates et al., 2015; Hendrick,
Altshuler, Strouse, & Grosser, 2000; O’Connor, Heron, Golding, Beveridge, & Glover, 2002). This may include the need to incorporate different treatment components, or emphasize different elements during treatment (e.g., cognitive versus behavioural verses increasing social support access and utilisation), depending on the individual presentation. For example, a different intervention plan is likely to be needed for a woman who presents as predominantly depressed with some mild co-occurring anxiety and/or stress, as opposed to a woman who is highly anxious with mild to moderate concurrent depression and/or stress symptoms.

Furthermore, given that distress symptoms were found to fluctuate and peak at both early pregnancy and later in pregnancy, and that early depressive symptoms predicted not only higher depressive symptoms later in pregnancy, but also increased anxiety and stress, it seems particularly pertinent that health professionals are adequately informed about these patterns of incidence, so that women can be monitored and assessed throughout the entire perinatal period, and not just at a single time-point. Assessing distress symptoms in early pregnancy may be particularly important, given that they may be a critical predictor of mood and distress throughout pregnancy as indicated in Study Two. Given that there is evidence that sub-clinical symptoms of distress can yield negative maternal and infant outcomes, there also appears to be a need for health professionals to understand and acknowledge the importance and impact that sub-threshold symptoms of depression, anxiety and stress may have, and not exclusively focus on women who present as notably distressed, and/or who self disclose such experiences. In light of the fact that GP’s, midwives and obstetricians often see women repeatedly during pregnancy and again later during the postpartum period, they are arguably the key professionals who are best able to assess for distress at these time points.
The findings of Study Three suggest that maternal coping strategies are likely to be involved in the complex pathways that influence maternal distress. This study revealed what the most frequently used coping strategies are, in a community based sample of Australian women, thus contributing to the limited research in this area, particularly when one considers the lack of data available from Australian cohorts. Exploring the coping strategies used by women during the perinatal period appears to add value to the broader assessment framework. The effectiveness of preventative and intervention programs may also be enhanced if the influence of different coping strategies is considered and incorporated. Further research is needed, including replicating the current study with a clinical sample, in an effort to better understand the clinical significance of the present findings, and whether a different pattern of results may emerge with women who present with more severe and complex presentations. A wider psychosocial assessment that incorporates other key factors that may be influencing the development and maintenance of distress and/or patterns of coping is also warranted.

The findings of Study Four further highlight the relationship between coping and distress, while also suggesting that cognitive appraisal factors may also be involved in the mechanisms that contribute to maternal distress. In light of these findings, prevention and treatment programs designed to reduce the incidence of perinatal depression, anxiety and stress may benefit from addressing how mothers appraise or perceive their current circumstances, and in turn what strategies they utilise to cope with the demands of their situation. It is in no way suggested that appraisal and coping strategies replace other key components in terms of both assessment and treatment plans (e.g., assessing or mobilising social support), but rather that the impact of these factors is considered so that women and health professionals understand their potential influence.
In Australia, the clinical practice guidelines for depression and related disorders in the perinatal period developed as part of the National Perinatal Depression Initiative (NPDI) recommend that routine depression screening and a wider psychosocial assessment is conducted at least once in the antenatal and postnatal periods respectively (beyondblue, 2011). A wider psychosocial assessment explores the presence and influence of other key factors that may be impacting on emotional wellbeing. In turn, this psychosocial assessment may present an opportunity to also ask some questions about appraisal and coping factors as part of an extended assessment where indicated. For example, exploring issues surrounding perceived threat, loss of control, and/or use of avoidance may be particularly important if the findings from the present studies continue to be replicated.

When one reflects on the issues associated with implementing effective routine screening with women during the perinatal period, the importance of appropriate training is undoubtedly an important point to consider. Training for health professionals on how to appropriately and sensitively conduct the initial screening and assessment is needed, as well as training on when further assessment is indicated, and how to implement these processes within one’s role and workplace setting. This is further highlighted when one considers that women are often cared for by a variety of health providers during pregnancy and the postpartum period, and that all these primary care providers have a key role in the assessment, formulation, diagnosis and management of women’s mental health (Charles, Britt, Fahridin, & Miller, 2007). It is thus important that adequate training is accessible and potentially made compulsory for all relevant health professionals, including GP’s, midwives, maternal and child health nurses, obstetricians, social workers, and mental health professionals.
Ethically, screening must be accompanied by appropriate follow-up support, referral options and pathways to care for women identified as experiencing, or at risk of developing, perinatal depression, anxiety, stress and/or other psychosocial issues. Consequently, knowledge of available and appropriate local referral pathways for different levels of severity, complexity, and risk is undoubtedly essential. Referral pathways ideally need to be locally designed and should take into account the availability and structure of local health care agencies, as well as any specialised perinatal mental health services and/or professionals. There is also a need to take into account a woman’s readiness to accept help, and her beliefs about what might be helpful and appropriate for her at the moment. It is essential to also acknowledge the importance of a multidisciplinary approach and collaboration between service providers where possible. Communication and collaboration between health professionals is necessary, in an effort to ensure that each health care provider practices within their area of responsibility and competency, and that any progress, changes or barriers to care are communicated to the extended care team.

Past research has indicated that women may find it difficult to seek and/or accept assistance for emotional distress in the perinatal period, and may often be unaware that help is available (Dennis & Chung-Lee, 2006). When one considers the nature of depression, anxiety and stress symptoms, along with this lack of knowledge, it is understandable as to why women may feel overwhelmed, and may find it difficult to make a decision about what effective help looks like (Bilstza, Ericksen, Buist, & Milgrom, 2010). Having a positive relationship with their relevant health professional/s has been shown to facilitate treatment uptake for women during the perinatal period (Dennis & Chung-Lee, 2006). Women have indicated that an ‘ideal’ health professional is one who demonstrates interpersonal qualities such as empathy and kindness; but
also knowledge about appropriate support and pathways to care, while also providing active and timely assistance and continuity of care (Bilstza et al., 2010). Previous findings have shown that women often find it difficult to disclose emotional health difficulties to their family, friends and even health professionals (Dennis & Chung-Lee, 2006). Findings such as these highlight how important it is for key health professionals to be able to identify and engage women who require additional support, and provide information about the options that are available and appropriate to their current circumstances, which may in turn improve adherence to a treatment plan (Kwan, Dimidjian, & Rizvi, 2010; Swift & Callahan, 2009).

It seems feasible to suggest that if the current results are replicated, and health professionals are educated on the trajectory of perinatal distress and the importance of factors such as appraisal and coping, that showing an understanding of how for example it can be difficult to cope with situations that seem threatening and/or uncontrollable after the baby is born, may contribute to a positive therapeutic experience. Women may feel like someone has taken the time to really listen to them and try to understand the reason for their current presentation, rather than focusing on the collection of symptoms present per se. Given that even women who are not identified as depressed or anxious have indicated that the screening and assessment process is helpful in providing valuable reassurance that help is available should they require it in the future, screening appears to be generally acceptable to women, when conducted appropriately by well informed and suitably trained health professionals.

Final Summary and Concluding Statements

Collectively, the results from the current studies suggest that clinical efforts aimed at reducing the incidence of perinatal depression, anxiety and stress may benefit from adopting a broader conceptualisation of maternal distress, with mindful monitoring required across the
entire perinatal period, from early pregnancy onwards. The effectiveness of preventative and intervention programs may be improved with routine screening and a wider psychosocial assessment, and if the role of cognitive appraisal and coping strategies is considered in such screening and treatment programs. Women’s appraisal of threat, control and use of avoidance as a means of coping may be particularly important. A demonstrable understanding of these interrelationships may also increase women’s engagement with health services and professionals. Given that Study Four in particular is the only study to date to investigate cognitive appraisal and coping strategies as unique predictors of depression, anxiety and stress during both the antenatal and postnatal period, further research is needed to establish the role of these variables in the development maternal distress. While our insight into the role that various psychosocial factors have has improved over the years, particularly in regards to the antenatal period, there is a need to keep enhancing our understanding of the complex pathways in play so that appropriate and effective treatment programs can continue to be developed. Prospective studies with clear and consistent definitions and assessment tools are essential. Future research examining the replication of these findings with more diverse populations is needed, including both clinical and general samples, along with objective assessment of maternal distress (e.g., use of clinical interviews and self-report measures). In addition, when designing future studies it may be beneficial to consider Lazarus and Folkman’s transaction stress model in conjunction with the bio-psychosocial framework (Milgrom et al., 1999).

Perinatal mental health continues to be a major health concern for a significant number of women and their families, and is associated with a complex interplay of maternal, social, demographic and dyadic variables. Given the range and severity of the emotional, physical and social consequences of maternal depression, anxiety and stress, continuing to work towards
unraveling the pathways which contribute to a poor transitional towards parenthood is essential, in order to enable targeted interventions to decrease the risk and incidence of perinatal distress.

If the current patterns continue to be replicated in future studies, it may allow key health professionals to better identify which expectant and new mothers are at increased risk of emotional distress across the entire perinatal period, and specific factors that need to be targeted in management plans. Given that even mild to moderate distress can have a significant impact on a woman’s wellbeing (Furber et al., 2009), it is also important to keep investigating not just the factors that contribute to clinical depression, anxiety and stress, but also subclinical symptoms. A multidisciplinary approach to the management and care for perinatal women is needed, in an effort to appropriately address the range of experiences that may be present, whether it be mild to moderate distress, or more severe and complex psychopathology. Further research that contributes towards improved screening and identification will clearly enhance early intervention programs and may potentially reduce costs to the healthcare system associated with long-term treatment. More importantly, early and effective screening may help reduce the duration and impact that maternal distress has not just on women themselves, but also their partners, children and families.
References:


Appendix A: Ethics Approval

Research Services
Office of the Deputy Vice-Chancellor (Research) (Melbourne Campus)

MEMORANDUM

TO: Dr Helen Skouteris
    School of Psychology, Burwood
    cc: Sofia Rallis

FROM: Deakin University Human Research Ethics Committee (DU-HREC)

DATE: 15 May 2009

SUBJECT: Project EC 36-2009  (Please quote this project number in future communication)
Maternal and infant wellbeing: Pre and post birth

The application for this project was considered at the DU-HREC meeting held on 30 March 2009.

Approval has been given for Sofia Rallis, under the supervision of Dr Helen Skouteris, School of Psychology, to undertake this project for a period of three years from 11 May 2009.

The approval given by the Deakin University Human Research Ethics Committee is given only for the project and for the period as stated in the approval. It is your responsibility to contact the Executive Officer immediately should any of the following occur:

- Serious or unexpected adverse effects on the participants
- Any proposed changes in the protocol, including extensions of time.
- Any events which might affect the continuing ethical acceptability of the project.
- The project is discontinued before the expected date of completion.
- Modifications are requested by other HREC’s.

In addition you will be required to report on the progress of your project at least once every year and at the conclusion of the project. Failure to report as required will result in suspension of your approval to proceed with the project.

DU-HREC may need to audit this project as part of the requirements for monitoring set out in the National Statement on Ethical Conduct in Human Research (2007).

Vicky Bates, Secretary
On behalf of DU-HREC
03 9251 7123
Appendix B: Study Flyer

PREGNANT WOMEN REQUIRED FOR A STUDY ON MATERNAL AND INFANT WELLBEING: PRE- AND POST BIRTH.

"Are you between 10-16 weeks pregnant? Would you like to contribute to a world first study on maternal and infant wellbeing pre- and post birth?"

Pregnant women who are between 10-16 weeks gestation are invited to take part in a study that examines maternal and infant wellbeing throughout pregnancy and the first 12 months post birth. This is a confidential study, being conducted by Ms Sofia Rallis and Dr Helen Skouteris in the School of Psychology, Deakin University. The findings of this study will contribute invaluable information to the literature about maternal and infant wellbeing during pregnancy and the first year post birth.

Participation will entail completing a set of questionnaires on a monthly basis from early pregnancy, through to 12 months post birth. While this may sound like a lot, most of the questionnaires will take less than 10 minutes to complete at each time.

If you are interested in participating in this vital research or would like more information about our study, please contact:

Ms Sofia Rallis
School of Psychology
Deakin University
Victoria 3125
Phone: (03) 9244-6538
Email: sofia.rallis@deakin.edu.au

We look forward to hearing from you!
DEAKIN UNIVERSITY
PLAIN LANGUAGE STATEMENT AND CONSENT FORM

TO: Prospective participants

PLAIN LANGUAGE STATEMENT

Date: November, 2009

Full Project Title: Maternal and Infant Wellbeing: Pre and Post Birth

Principal Researcher/PhD Candidate: Miss Sofia Rallis (School of Psychology, Deakin University, Burwood)

Research Supervisors: Dr Helen Skouteris and Professor Marita McCabe, (School of Psychology, Deakin University, Burwood) and Professor Jeannette Milgrom (School of Psychology, The University of Melbourne).

1. Your Consent
You are invited to take part in this research project being conducted by Deakin University.

This Plain Language Statement contains detailed information about the research project. Its purpose is to explain to you as openly and clearly as possible all the procedures involved in this project so that you can make a fully informed decision about whether you are going to participate.

Once you understand what the project is about and if you agree to take part in it, you will be asked to sign the Consent Form. By signing the Consent Form, you indicate that you understand the information and that you give your consent to participate in the research project. Please do this prior to completing the questionnaires.

You will be given a copy of the Plain Language Statement and Consent Form to keep as a record.

2. Purpose and Background
The purpose of this project is to investigate women’s general experiences during pregnancy and the first 12 months following birth. This includes issues associated with general mood as well as experiences related to self esteem, body image, relationship quality and parental stress.

The project aims to provide some insight into questions regarding the level and type of distress experienced by women across pregnancy and the first postpartum year, and whether any ‘critical periods’ can be identified where early intervention may be most effective. The identification of risk factors and consequences to maternal distress during pregnancy and the postpartum will also be explored.

In order to obtain accurate and meaningful results, we aim to recruit 250 women into the project who will complete a series of questionnaires on a monthly basis throughout pregnancy and the first postpartum year. You are invited to participate in this research project because you are currently in your first trimester of pregnancy.
3. Funding
This project is being funded through a student PhD budget provided by the School of Psychology, Deakin University.

4. Procedure
If you agree to participate, you will be required to complete a short series of questionnaires once a month for approximately 18 months (6 months across pregnancy and 12 months following birth). While this may sound like a lot, most of the questionnaires will take approximately 5-10 minutes to complete. Once every 3 months the questionnaire pack may take approximately 30-40 minutes to complete and will include questions about maternal and infant health and wellbeing, weight and height, as well as demographic information such as age and family income.

Examples of questions that will be asked are “I found it difficult to relax” and “In the past 7 days I have been able to laugh and see the funny side of things”. Participants will receive all the questionnaires in the mail and will be asked to return these to the University using the reply paid envelopes which will be provided.

5. Possible Benefits
By participating in this project, you will be making an invaluable contribution to a very important area of research concerning maternal and infant health and wellbeing. The results obtained at the conclusion of the study will potentially have implications for numerous health professions, expectant mothers as well as the general community.

Attaining a thorough and comprehensive understanding into women’s experiences in the first postpartum year can potentially indicate when early intervention would be most helpful so as to alleviate, or at least lessen, the distress experienced by a significant number of women both in Australia and overseas. By participating in and completing the study, you will also be in the running to win one of ten $50 Coles and Myer Group Gift Vouchers.

6. Possible Risks
There are no anticipated risks outside the normal day-to-day activities. However, given that the questionnaires will include questions regarding issues such as anxiety and stress, there is a slight possibility that you may experience some concern about your responses. Thus, you are invited to examine the questionnaire material before agreeing to participate. If you do participate and find that you are uncomfortable or overly worried about your responses to any of the questionnaire items, or if you find participation in the project distressing, you should contact the Principal Researcher (Sofia Rallis on: 03 9244-6538) as soon as convenient. You will have the opportunity to discuss your concerns in a confidential manner and appropriate follow-up will be suggested if necessary.

If considerable distress is revealed in the data obtained by the Principal Researcher during the course of the study, you will be contacted by the Principal Researcher and referred to someone who can be of assistance.

7. Privacy, Confidentiality and Disclosure of Information
You can be assured that you will not be identified by name in any way in the reporting of our results in publications and conference presentation. Any information we
collect from you that can identify you will remain confidential and will be stored in a
locked cabinet within the School of Psychology at Deakin University for a minimum of 5
years from the date of publication.

8. Results of Project
A summary of the findings will be provided to the school and available for any
interested participants to read at the completion of the study. Please email
sofia.rallis@deakin.edu.au if you would like to receive a copy of this report.

9. Participation is voluntary
Participation in any research project is voluntary. If you do not wish to take part you are
not obliged to. If you decide to take part and later change your mind, you are free to withdraw
from the project at any stage. Any information obtained from you to date will not be used and will
be destroyed. Your decision whether to take part or not to take part, or to take part and then
withdraw, will not affect your relationship with Deakin University in any way.

Before you make your decision, a member of the research team will be available to
answer any questions you have about the research project. You can ask for any information you
want. Sign the Consent Form only after you have had a chance to ask your questions and have
received satisfactory answers.

If you decide to withdraw from this project, please notify a member of the research team
so they can inform you if there are any special requirements linked to withdrawing.

10. Ethical Guidelines
The study will be carried out in accordance with the National Statement on Ethical
Conduct in Human Research (2007). This statement has been developed to protect the interests
of people who agree to participate in human research studies.

The ethical aspects of this research project have been approved by the Human Research Ethics
Committee of Deakin University. The research will be carried out in the School of Psychology
Deakin University, 221 Burwood Highway, Burwood Victoria.

11. Complaints
Should you have any concerns about the conduct of this research project, please contact
the Secretary, Ethics Committee, Research Services Division, Deakin University, 221 Burwood
Highway, Burwood Victoria, 3125. Telephone: (03) 9251-7123, Facsimile: (03) 9244-6581;
research-ethics@deakin.edu.au Please quote project number EC 36-2009

12. Reimbursement for your costs
You will not be paid for your participation in this project. However, if you remain a
participant in this study over the 18 months you will be entered into a prize draw to win one of 10
x $50 gift vouchers.

13. Further Information:
Contact Sofia Rallis in the School of Psychology, Deakin University, 221 Burwood
Highway, Burwood, Victoria, 3125, on (03) 9244-6538 or email:
sofia.rallis@deakin.edu.au
TO: Participants

Consent Form
Researcher’s Copy

Date: November, 2009

Full Project Title: Maternal and Infant Wellbeing: Pre and Post Birth

Researchers: Miss Sofia Rallis, Dr Helen Skouteris, Professor Marita McCabe, (School of Psychology, Deakin University, Burwood) and Professor Jeannette Milgrom (School of Psychology, The University of Melbourne).

I have read and I understand the attached Plain Language Statement.

I freely consent to participate in this project according to the conditions in the Plain Language Statement.

I have been given a copy of the Plain Language Statement and Consent Form to keep.

The researchers have agreed not to reveal my identity and personal details, including where information about this project is published, or presented in any public form.

Participant’s Name (Printed) ………………………………………………………………
Participant’s Signature………………………………………………………..Date…………………..

Participant’s Contact Details
Address: ……………………………………………………………………………………….…….
…………………………………………………………………………………………
Home Phone: …………………………………………………………………….…….
Mobile: ………………………………………………………..………………………...
Email Address: ………………………………………………………………….…….

The researchers will be applying for further funding to continue their research longer term. If you agree to be contacted for research studies of this type in the future please sign below.

I consent to the researchers named here contacting me for future research studies that I am not obliged to take part in.

Participant’s name: ……………………….……… Signature: …………………………….

Please return the signed form to: Miss Sofia Rallis, School of Psychology, Deakin University, 221 Burwood Highway. Burwood, Victoria 3125.
TO: Participants

Consent Form
Participant’s Copy

Date: November, 2009

Full Project Title: Maternal and Infant Wellbeing: Pre and Post Birth

Researchers: Miss Sofia Rallis, Dr Helen Skouteris, Professor Marita McCabe, (School of Psychology, Deakin University, Burwood) and Professor Jeannette Milgrom (School of Psychology, The University of Melbourne).

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The researchers have agreed not to reveal my identity and personal details, including where information about this project is published, or presented in any public form.

Participant’s Name (Printed) ………………………………………………………………

Participant’s
Signature………………………………………………………..Date…………………………..

Participant’s Contact Details
Address: ……………………………………………………………………………………………

………………………………………………………………………………………………

Home Phone: …………………………………………………………………………………

Mobile: ………………………………………………………………………………………

Email Address: …………………………………………………………………………………

The researchers will be applying for further funding to continue their research longer term. If you agree to be contacted for research studies of this type in the future please sign below.

I consent to the researchers named here contacting me for future research studies that I am not obliged to take part in.

Participant’s name: …………………………… Signature: ……………………………

Please keep this signed form for your records.
Appendix D: Questionnaire for First Pregnancy Time-Point (Time 1)

Maternal and Infant Wellbeing Study
*(T1 – 16wks Preg)*

Thank you for taking the time to complete the following information.
Your responses will remain strictly confidential.

Today’s date is: ..................................................

Age .................................................................................................................................

Date of birth ..................................................................................................................

How many weeks pregnant are you at present? .........................................................

Estimated due date .......................................................................................................
General and Background Information

1. **Height**: .............................................. centimetres

2. **Current weight**: .................................. kilograms

3. Are you being weighed by your obstetrician/doctor/midwife during pregnancy? (please circle) (1) Yes (2) No

   **If Yes:**

   b) At how many weeks pregnant was your *first weighing*? .......................... weeks

   c) What did you weigh at that *first weighing*? ............................... kilograms

   d) At how many weeks was your *last weighing*? .............................. weeks

   e) What did you weigh at that *last weighing*? ............................... kilograms

4. **Current marital status**: (please circle one)

   (1) Married  (2) Divorced  (3) De Facto

   (4) Separated  (5) Widowed  (6) Never Married/Single

5. Are you an Aboriginal or Torres Strait Islander? (1) Yes (2) No

6. **Location of your birth**:

   (1) Australia  (2) New Zealand  (3) United Kingdom

   (4) Europe  (5) North America  (6) South America

   (7) Africa  (8) Middle East  (9) Asia

7. Where were your parents born? (Name of country please):

   Father: .............................................................. Mother: ..............................................................

8. Main language spoken at home:

   (1) English  (2) Other (please specify): ..............................................

9. Please indicate the highest level of education you have completed.

   (1) Still at secondary school  (2) Did not finish secondary school

   (3) Year 12 or equivalent  (4) Certificate Level

   (5) Advanced Diploma/Diploma  (6) Graduate Diploma/Certificate

   (7) Bachelor Degree  (8) Postgraduate Degree
10. Are you currently in paid employment?  
   (1) Yes  (2) No  (If No, please go to Q13) 
   If Yes, do you work full time/part time? .................................................................
   What is your occupation? ..............................................................................................

11. Do you intend to return to work after the birth of your baby?  
   (1) Yes  (2) No
   If Yes, what length of maternity leave do you intend to take? .................. (number of weeks)

12. Does your employer provide work-based child care?  
   (1) Yes  (2) No

13. Please indicate your approximate annual family income:
   (1) Under 25,000  (2) 25,001- 45,000  (3) 45,001- 65,000
   (4) 65,001- 85,000  (5) 85,001- 105,000  (6) 105,001-125,000
   (7) 125,001- 145,000  (8) Over 145,001

14. Is this your first pregnancy?  
   (1) Yes  (2) No

15. Did you require any assistance conceiving this pregnancy? (i.e., IVF treatment)
   (1) Yes please state: .................................................................  (2) No

16. Number of children you have, not including current pregnancy (please circle)
   (0) zero  (1) one  (2) two
   (3) three  (4) four  (5) five or more

17. If this is not your first pregnancy, did you experience any complications in your other pregnancies?
   (1) Yes  (2) No  (3) N/A
   If yes, please describe
   briefly........................................................................................................................................
   ........................................................................................................................................

18. Are you a smoker?  
   (1) Yes  (2) No  (If No, please go to Q19)
   b) If yes, how many cigarettes did you normally smoke a day when not pregnant?
      ..............
c) Are you smoking during this pregnancy?  
(1) Yes  
(2) No

If yes, please complete the statement below that is relevant to you:

d) How many cigarettes are you smoking per day?  ...........................................

e) How many cigarettes are you smoking per week?  .............................................

Over the past month how many glasses of alcohol have you consumed (on average) per week? (please circle one)

(1) none  
(2) one to two  
(3) three to four  
(4) five to six  
(5) more than seven

19. Have you consumed more than two glasses of alcohol at any one time during this pregnancy?

(1) Yes  
(2) No

b) If Yes, how often has this occurred? (please circle one)

(1) once  
(2) twice  
(3) three times  
(4) four or more times

20. Over the past month how many cups of coffee have you consumed a day? (please circle one).

(1) none  
(2) one  
(3) two  
(4) three  
(5) four or more

21. a) During the past month, have you engaged in any form of exercise?

(1) Yes  
(2) No  (If No, please go to Q23)

b. If yes, please describe your exercise type (you may choose more than one):

(1) Power-walking  
(2) Walking  
(3) Yoga  
(4) Aerobics  
(5) Gym Circuit  
(6) Team Sports  
(7) Swimming  
(8) Other: ..................

c. Please estimate your average total weekly exercise duration (for the past month) .................minutes per week
Please read each statement and **place a tick in the appropriate bracket** to indicate how much the statement applied to you **over the past month**. There are no right or wrong answers. Please do not spend too much time on any statement.

*The rating scale is as follows:*

0  Did not apply to me at all
1  Applied to me to some degree, or some of the time
2  Applied to me to a considerable degree, or a good part of time
3  Applied to me very much, or most of the time

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<th>1</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>I found it hard to wind down</td>
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<tr>
<td>2</td>
<td>I was aware of dryness of my mouth</td>
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<td>3</td>
<td>I couldn’t seem to experience any positive feeling at all</td>
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<td>4</td>
<td>I experienced breathing difficulty (e.g., excessively rapid breathing,</td>
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<td></td>
<td>breathlessness in the absence of physical exertion)</td>
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<td>5</td>
<td>I found it difficult to work up the initiative to do things</td>
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<td>6</td>
<td>I tended to over-react to situations</td>
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<td>7</td>
<td>I experienced trembling (e.g., in the hands)</td>
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<td>8</td>
<td>I felt that I was using a lot of nervous energy</td>
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<td>9</td>
<td>I was worried about situations in which I might panic and make a fool of myself</td>
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<td>10</td>
<td>I felt that I had nothing to look forward to</td>
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<td>11</td>
<td>I found myself getting agitated</td>
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<td>12</td>
<td>I found it difficult to relax</td>
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<td>13</td>
<td>I felt down-hearted and blue</td>
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<tr>
<td>14</td>
<td>I was intolerant of anything that kept me from getting on with what I was doing</td>
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<tr>
<td>15</td>
<td>I felt I was close to panic</td>
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<td>16</td>
<td>I was unable to become enthusiastic about anything</td>
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<td>17</td>
<td>I felt I wasn’t worth much as a person</td>
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<td>18</td>
<td>I felt that I was rather touchy</td>
<td>( )</td>
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<tr>
<td>19</td>
<td>I was aware of the action of my heart in the absence of physical exertion</td>
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<td></td>
<td>(e.g., sense of heart rate increase, heart missing a beat)</td>
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<tr>
<td>20</td>
<td>I felt scared without any good reason</td>
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<tr>
<td>21</td>
<td>I felt that life was meaningless</td>
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</tbody>
</table>
Please place a tick in the bracket next to the answer which comes closest to how you have felt over the past month, not just how you feel today.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. I have been able to laugh and see the funny side of things.</td>
<td>6. Things have been getting on top of me.</td>
<td></td>
</tr>
<tr>
<td>As much as I always could</td>
<td>Yes, most of the time I haven’t been able to cope at all</td>
<td></td>
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<tr>
<td>Not quite so much now</td>
<td>Yes, sometimes I haven’t been coping as well as usual</td>
<td></td>
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<tr>
<td>Definitely not so much now</td>
<td>Not, most of the time I have coped quite well</td>
<td></td>
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<tr>
<td>Not at all</td>
<td>No, I have been coping as well as ever</td>
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<tr>
<td>2. I have looked forward with enjoyment to things.</td>
<td>7. I have been so unhappy that I have had difficulty sleeping.</td>
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<tr>
<td>As much as I ever did</td>
<td>Yes, most of the time</td>
<td></td>
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<tr>
<td>Rather less than I used to</td>
<td>Yes, sometimes</td>
<td></td>
</tr>
<tr>
<td>Definitely less than I used to</td>
<td>Not very often</td>
<td></td>
</tr>
<tr>
<td>Hardly at all</td>
<td>No, not at all</td>
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<tr>
<td>3. I have blamed myself unnecessarily when things went wrong.</td>
<td>8. I have felt sad or miserable.</td>
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<tr>
<td>Yes, most of the time</td>
<td>Yes, most of the time</td>
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<tr>
<td>Yes, some of the time</td>
<td>Yes, quite often</td>
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<td>Not very often</td>
<td>Not very often</td>
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<tr>
<td>No, never</td>
<td>No, not at all</td>
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<td>4. I have been anxious or worried for no good reason.</td>
<td>9. I have been so unhappy that I have been crying.</td>
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<tr>
<td>No, not at all</td>
<td>Yes, most of the time</td>
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<tr>
<td>Hardly ever</td>
<td>Yes, quite often</td>
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<tr>
<td>Yes, sometimes</td>
<td>Only occasionally</td>
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<td>Yes, very often</td>
<td>No, never</td>
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<td>5. I have felt scared or panicky for no very good reason.</td>
<td>10. The thought of harming myself has occurred to me.</td>
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<tr>
<td>Yes, quite a lot</td>
<td>Yes, quite often</td>
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<tr>
<td>Yes, sometimes</td>
<td>Sometimes</td>
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<tr>
<td>No, not much</td>
<td>Hardly ever</td>
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<tr>
<td>No, not at all</td>
<td>Never</td>
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</tbody>
</table>
Please tick **ONE** set of brackets to indicate how much you agree/disagree with each statement in relation to how you have felt *over the past month*.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0)</td>
<td>(1)</td>
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<tr>
<td>1. On the whole I am satisfied with myself.</td>
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<td>2. At times I am no good at all.</td>
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<td>3. I feel that I have a number of good qualities.</td>
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<td>4. I am able to do things as well as most other people.</td>
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<td>5. I feel I do not have much to be proud of.</td>
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<td>6. I certainly feel useless at times.</td>
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<td>7. I feel I am a person of worth, at least on equal plane of others.</td>
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<td>8. I wish I could have more respect for myself.</td>
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<tr>
<td>9. All in all I am inclined to think I am a failure.</td>
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<td>10. I take a positive attitude toward myself.</td>
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</tbody>
</table>
The following statements relate to your relationship with your husband/partner. Please read each statement and then **place a tick in the bracket** that corresponds to how strongly you agree/disagree with each statement.

<table>
<thead>
<tr>
<th>How often do you and your partner agree on:</th>
<th>Always Agree</th>
<th>Almost Always Agree</th>
<th>Occasionally Disagree</th>
<th>Frequently Disagree</th>
<th>Almost Always Disagree</th>
<th>Always Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Handling family finances</td>
<td>( )</td>
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<td>2. Matters of recreation</td>
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<td>3. Religious matters</td>
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<td>4. Demonstrations of Affection</td>
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<td>5. Friends</td>
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<td>6. Sex relations</td>
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<td>7. Conventionality (correct or 'proper' behavior)</td>
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<td>8. Philosophy of life</td>
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<td>9. Ways of dealing with parents or in-laws</td>
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<td>10. Aims, goals, and things believed important</td>
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<td>11. Making major decisions</td>
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<td>12. Amount of time spent together</td>
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<td>13. Household tasks</td>
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<td>14. Leisure time interests and activities</td>
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<td>15. Career decisions</td>
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<td>16. How often do you discuss or have you considered divorce, separation, or terminating your relationship?</td>
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<td>17. How often do you/your partner leave the house after a fight?</td>
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<td>18. In general, how often do you think that things between you and your partner are going well?</td>
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<td>19. Do you confide in your partner?</td>
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<td>20. Do you ever regret that you married (or lived together)?</td>
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<td>21. How often do you and your partner argue?</td>
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<td>22. How often do you and your partner “get on each others’ nerves?”</td>
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</table>
23. Do you kiss your partner?  

Every day (0)  Almost every day (1)  Occasionally (2)  Rarely (3)  Never (4)

24. Do you and your partner engage in outside interests together?  

25. How often would you say the following events occur between you and your partner?  

Never (0)  Less than once a month (1)  Once or twice a month (2)  Once or twice a week (3)  Once a day (4)  More often (5)

26. Have a stimulating exchange of ideas

27. Laugh together

28. Calmly discuss something

29. Work together on a project

30. There are some things about which couples sometimes agree and sometimes disagree. Please indicate if either item below caused differences of opinions or were problems in your relationship during the past month.

Yes (0)  No (1)

29. Being too tired for sex.

30. Not showing love.

31. The dots on the following line represent different degrees of happiness in a relationship. The middle point, “happy,” represents the degree of happiness of most relationships. Please circle the dot which best describes the degree of happiness, all things considered, of your current relationship.

32. Which one of the following statements best describes how you feel about the future of your relationship?  

(please place a tick next to the appropriate statement)

______ I want desperately for my relationship to succeed, and would go to almost any length to see that it does.

______ I want very much for my relationship to succeed, and will do all I can to see that it does.

______ I want very much for my relationship to succeed, and will do my fair share to see that it does.

______ It would be nice if my relationship succeeded, but I can’t do much more than I am doing now to help it succeed.

______ It would be nice if it succeeded, but I refuse to do any more than I am doing now to keep the relationship going.

______ My relationship can never succeed, and there is no more that I can do to keep the relationship going.
The following statements relate to the way you feel about the people in your life. Please read each statement and then **place a tick in the bracket** that correspond to how strongly you agree with the statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Very Strongly Agree (7)</th>
<th>Agree (6)</th>
<th>Mildly Agree (5)</th>
<th>Neutral (4)</th>
<th>Mildly Disagree (3)</th>
<th>Disagree (2)</th>
<th>Very Strongly Disagree (1)</th>
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</thead>
<tbody>
<tr>
<td>1. There is a special person who is around when I am in need.</td>
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<td>2. There is a special person with whom I can share my joys and sorrows.</td>
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<td>3. My family really tries to help me.</td>
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<td>4. I get the emotional help and support I need from my family.</td>
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<td>5. I have a special person who is a real source of comfort to me.</td>
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<td>6. My friends really try to help me.</td>
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<td>7. I can count on my friends when things go wrong.</td>
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<td>8. I can talk about my problems with my family.</td>
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<td>9. I have friends with whom I can share my joys and sorrows.</td>
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<td>10. There is a special person in my life who cares about my feelings.</td>
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<td>11. My family is willing to help me make decisions.</td>
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<td>12. I can talk about problems with my friends.</td>
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</table>
The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month.

**During the past month:**

1. What time have you usually gone to bed? ___________________
2. How long (in minutes) has it taken you to fall asleep each night? ___________________
3. What time have you usually gotten up in the morning? ___________________
4. How many hours of actual sleep do you usually get that night? (This may be different than the number of hours you spend in bed) ___________________
5. During the past month, how often have you had trouble sleeping because you:
   a. Cannot get to sleep within 30 minutes (   ) (   ) (   ) (   )
   b. Wake up in the middle of the night or early morning (   ) (   ) (   ) (   )
   c. Have to get up to use the bathroom (   ) (   ) (   ) (   )
   d. Cannot breathe comfortably (   ) (   ) (   ) (   )
   e. Cough or snore loudly (   ) (   ) (   ) (   )
   f. Feel too cold (   ) (   ) (   ) (   )
   g. Feel too hot (   ) (   ) (   ) (   )
   h. Have bad dreams (   ) (   ) (   ) (   )
   i. Have pain or physical discomfort (   ) (   ) (   ) (   )
   j. Other reason(s), please describe, including how often you have had trouble sleeping because of this: ____________________ (   ) (   ) (   ) (   )

6. How often have you taken medicine (prescribed or ‘over the counter’) to help you sleep? (   ) (   ) (   ) (   )
7. How often have you had trouble staying awake while driving, eating meals, or engaging in social activities? (   ) (   ) (   ) (   )
8. How much of a problem has it been for you to keep up enthusiasm to get things done? Very Good (1) Fairly Good (2) Often Bad (3) Always Bad (4)
9. During the past month, how would you rate your sleep quality overall? (   ) (   ) (   ) (   )
The following questions ask you to indicate what you **generally do and feel** when you experience stressful events. Obviously, different events can bring out different responses, but please think about what you have usually done **over the past month** when you have been under a lot of stress.

Please respond to each of the following items by placing a tick in the appropriate set of brackets. Please try to respond to each item separately in your mind from each other, and answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer **for you**—not what you think "most people" would say or do.

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<tr>
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<th>I usually don't do this at all (1)</th>
<th>I usually do this a little bit (2)</th>
<th>I usually do this a medium amount (3)</th>
<th>I usually do this a lot (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I try to grow as a person as a result of the experience.</td>
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<td>2.</td>
<td>I turn to work or other activities to take my mind off things.</td>
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<td>3.</td>
<td>I get upset and let my emotions out.</td>
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<td>4.</td>
<td>I try to get advice from someone about what to do.</td>
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<td>5.</td>
<td>I concentrate my efforts on doing something about it.</td>
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<td>6.</td>
<td>I say to myself &quot;this isn't real&quot;</td>
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<td>7.</td>
<td>I put my trust in God.</td>
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<td>8.</td>
<td>I laugh about the situation.</td>
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<td>9.</td>
<td>I admit to myself that I can't deal with it, and quit trying.</td>
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<td>10.</td>
<td>I restrain myself from doing anything too quickly.</td>
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<td>11.</td>
<td>I discuss my feelings with someone.</td>
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<td>12.</td>
<td>I use alcohol or drugs to make myself feel better.</td>
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<td>13.</td>
<td>I get used to the idea that it happened.</td>
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<td>14.</td>
<td>I talk to someone to find out more about the situation.</td>
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<td>15.</td>
<td>I keep myself from getting distracted by other thoughts or activities.</td>
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<td>16.</td>
<td>I daydream about other things.</td>
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<td>17.</td>
<td>I get upset, and am really aware of it.</td>
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<td>18.</td>
<td>I seek God’s help.</td>
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<td>19.</td>
<td>I make a plan of action.</td>
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<td>20.</td>
<td>I make jokes about it.</td>
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<td>21.</td>
<td>I accept that this has happened and that it can't be changed.</td>
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<td>22.</td>
<td>I hold off doing anything about it until the situation permits.</td>
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<td>23.</td>
<td>I try to get emotional support from friends or relatives.</td>
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<td>24.</td>
<td>I just give up trying to reach my goal.</td>
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<td>25.</td>
<td>I take additional action to try to get rid of the problem.</td>
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<td>26.</td>
<td>I try to lose myself for a while by drinking alcohol or taking drugs.</td>
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<td>27.</td>
<td>I refuse to believe that it has happened.</td>
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<td>28.</td>
<td>I let my feelings out.</td>
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<td>29.</td>
<td>I try to see it in a different light, to make it seem more positive.</td>
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<td>30.</td>
<td>I talk to someone who can do something concrete about the problem.</td>
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<td>31.</td>
<td>I sleep more than usual.</td>
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<td>32.</td>
<td>I try to come up with a strategy about what to do.</td>
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<td>33.</td>
<td>I focus on dealing with this problem, and if necessary let other things slide a little.</td>
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<td>34.</td>
<td>I get sympathy and understanding from someone.</td>
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<td>35.</td>
<td>I drink alcohol or take drugs, in order to think about it less.</td>
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<td>36.</td>
<td>I kid around about it.</td>
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<td>37.</td>
<td>I give up the attempt to get what I want.</td>
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<td>38.</td>
<td>I look for something good in what is happening.</td>
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<td>39.</td>
<td>I think about how I might best handle the problem.</td>
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<td>40.</td>
<td>I pretend that it hasn't really happened.</td>
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<td>41.</td>
<td>I make sure not to make matters worse by acting too soon.</td>
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<td>42.</td>
<td>I try hard to prevent other things from interfering with my efforts at dealing with this.</td>
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<td>43.</td>
<td>I go to movies or watch TV, to think about it less.</td>
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<td>44.</td>
<td>I accept the reality of the fact that it happened.</td>
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<td>45.</td>
<td>I ask people who have had similar experiences what they did.</td>
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<td>46.</td>
<td>I feel a lot of emotional distress and I find myself expressing those feelings a lot.</td>
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<td>47.</td>
<td>I take direct action to get around the problem.</td>
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<td>48.</td>
<td>I try to find comfort in my religion.</td>
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<td>49.</td>
<td>I force myself to wait for the right time to do something.</td>
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<td>50.</td>
<td>I make fun of the situation.</td>
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<td>51.</td>
<td>I reduce the amount of effort I put into solving the problem.</td>
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<td>52.</td>
<td>I talk to someone about how I feel.</td>
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<td>53.</td>
<td>I use alcohol or drugs to help me get through it.</td>
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<td>54.</td>
<td>I learn to live with it.</td>
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<td>55.</td>
<td>I put aside other activities in order to concentrate on this.</td>
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<td>56.</td>
<td>I think hard about what steps to take.</td>
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<td>57.</td>
<td>I act as though it hasn’t even happened.</td>
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<td>58.</td>
<td>I do what has to be done, one step at a time.</td>
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<td>59.</td>
<td>I learn something from the experience.</td>
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<td>60.</td>
<td>I pray more than usual.</td>
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The following questions relate to how you think and feel about your current pregnancy. When answering the questions, **please think about the period of time that has lapsed from the day you found out you were pregnant, until today.** Answer each question by placing a tick in the appropriate bracket.

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all (1)</th>
<th>Slightly (2)</th>
<th>Moderately (3)</th>
<th>Considerably (4)</th>
<th>Extremely (5)</th>
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<tbody>
<tr>
<td>1. Is this a totally hopeless situation?</td>
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<td>2. Does this situation create tension in me?</td>
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<td>( )</td>
</tr>
<tr>
<td>3. Is the outcome of this situation uncontrollable by anyone?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>4. Is there someone or some agency I can turn to for help if I need it?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>5. Does this situation make me feel anxious?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>6. Does this situation have important consequences for me?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>7. Is this going to have a positive impact on me?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>8. How eager am I to tackle this problem?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>9. How much will I be affected by the outcome of this situation?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>10. To what extent can I become a stronger person because of this situation?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>11. Will the outcome of this situation be negative?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>12. Do I have the ability to do well in this situation?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>13. Does this situation have serious implications for me?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>14. Do I have what it takes to do well in this situation?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>15. Is there help available to me for dealing with this situation?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>16. Does this situation tax or exceed my coping resources?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>17. Are there sufficient resources available to help me in dealing with this situation?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>18. Is it beyond anyone’s power to do anything about this situation?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>19. To what extent am I excited thinking about the outcome of this situation?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>20. How threatening is this situation?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>21. Is the problem unresolvable by anyone?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>22. Will I be able to handle the situation?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>23. Is there anyone who can help me to manage this situation?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>24. To what extent do I perceive this situation as stressful?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>25. Do I have the skills necessary to achieve a successful outcome to this situation?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>26. To what extent does this situation require coping efforts on my part?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>27. Does this situation have long-term consequences for me?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>28. Is this going to have a negative impact on me?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>
Please **place a tick in the appropriate set of brackets** to indicate how often you have used the following strategies as a way of managing some of the strains and challenges that are sometimes associated with being pregnant.

<table>
<thead>
<tr>
<th>Number</th>
<th>Strategy</th>
<th>Never</th>
<th>Rarely</th>
<th>Occasionally</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Imagined how the birth will go</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2.</td>
<td>Talked to people about what it takes to raise a child</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3.</td>
<td>Compared yourself to women having a more difficult pregnancy</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>4.</td>
<td>Taken out frustrations on other people</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>5.</td>
<td>Asked doctors or nurses about the birth</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>6.</td>
<td>Read from the bible or a book of prayers</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>7.</td>
<td>Tried to keep your feelings about being pregnant to yourself</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>8.</td>
<td>Tried to focus on what it important in life</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>9.</td>
<td>Slept in order to escape problems</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>10.</td>
<td>Thought about what it will be like after the baby comes</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>11.</td>
<td>Planned how you will handle the birth</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>12.</td>
<td>Spent time or talked with someone who just had a baby</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>13.</td>
<td>Made plans to get baby clothes or supplies</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>14.</td>
<td>Prayed for strength or courage to get through your pregnancy</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>15.</td>
<td>Gotten advice and understanding from someone about your pregnancy</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>16.</td>
<td>Tried not to think about the birth</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>17.</td>
<td>Spent time with other pregnant women or talked with them</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>18.</td>
<td>Told yourself that things could be worse</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>19.</td>
<td>Planned how you or someone else will take care of the baby</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>
20. Imagined or pretended being the mother of a newborn
21. Wished that the birth was already over
22. Tried to make yourself feel better with food
23. Thought about pregnant women who are doing better than you
24. Tried to stay away from other people
25. Prayed that the birth will go well
26. Talked to family or friends about what it is like to give birth
27. Prayed that the baby will be healthy
28. Wished that you weren’t pregnant
29. Tried to keep your feelings about the pregnancy from interfering with things you had to do
30. Felt that having a baby was fulfilling a lifetime dream or goal
31. Gone to church, synagogue, a mosque, or other place of worship
32. Read or watched something about childbirth that described what it would be like
The following is a list of events which may bring about changes in the lives of those who experience them. Please read through the list and for those that have **occurred in the past year**, place a tick in the column that indicates how positive or negative the impact was on your life at the time the event occurred. **Please leave blank if the event did not occur in the past year.**

<table>
<thead>
<tr>
<th>Extremely Negative</th>
<th>Moderately Negative</th>
<th>Somewhat Negative</th>
<th>No Impact</th>
<th>Somewhat Positive</th>
<th>Moderately Positive</th>
<th>Extremely Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
<td>+1</td>
<td>+2</td>
<td>+3</td>
</tr>
</tbody>
</table>

In the past year did the following occur? (Leave blank if the event did not occur in the past year.)

1. Marriage or setting up household with partner.
2. Detention in jail or comparable institution.
3. Death of a spouse/partner.
4. Major change in sleeping habits (much less or more sleep)
5. Death of a close family member.
6. Major change in eating habits (much more or less food intake).
7. Foreclosure on mortgage or loan.
8. Death of a close friend.
10. Minor law violations (traffic tickets, disturbing the peace, etc.)
11. You or your partner got pregnant.
12. Change in work situation (different work responsibility, major change in working conditions, hours, etc.).
14. Serious illness or injury of close family member.
15. Sexual difficulties.
16. Trouble with employer (in danger of losing job, being suspended, demoted, etc.).
17. Trouble with in-laws.
18. Major change in financial status (much better/worse off).
19. Major change in closeness of family members (increased or decreased closeness).
20. Gaining a new family member (through birth, adoption, family member moving in, etc.).
<table>
<thead>
<tr>
<th></th>
<th>Change of residence.</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.</td>
<td>Separation from partner (due to conflict).</td>
</tr>
<tr>
<td>23.</td>
<td>Major change in church activities (increased or decreased attendance).</td>
</tr>
<tr>
<td>24.</td>
<td>Reconciliation (making up) with partner.</td>
</tr>
<tr>
<td>25.</td>
<td>Major change in number of arguments with partner (a lot more or a lot fewer arguments).</td>
</tr>
<tr>
<td>26.</td>
<td>Change in spouse/partner’s work (loss of job, beginning new job, retirement, etc.).</td>
</tr>
<tr>
<td>27.</td>
<td>Major change in usual type and/or amount of recreation.</td>
</tr>
<tr>
<td>28.</td>
<td>Borrowing more than $100,000 (buying home, business, etc.).</td>
</tr>
<tr>
<td>29.</td>
<td>Borrowing less than $100,000 (buying car, getting a school loan, etc.).</td>
</tr>
<tr>
<td>30.</td>
<td>Being fired from job.</td>
</tr>
<tr>
<td>31.</td>
<td>You or your spouse/partner had an abortion.</td>
</tr>
<tr>
<td>32.</td>
<td>Major personal illness or injury.</td>
</tr>
<tr>
<td>33.</td>
<td>Major change in social activities, such as parties, movies, visiting (increased/ decreased participation).</td>
</tr>
<tr>
<td>34.</td>
<td>Major change in family living conditions (building new home, remodeling, deterioration of home, neighborhood).</td>
</tr>
<tr>
<td>35.</td>
<td>Divorce.</td>
</tr>
<tr>
<td>36.</td>
<td>Serious injury or illness of a close friend.</td>
</tr>
<tr>
<td>37.</td>
<td>Retirement from work.</td>
</tr>
<tr>
<td>38.</td>
<td>Son or daughter leaving home/moving out.</td>
</tr>
<tr>
<td>39.</td>
<td>End of formal schooling.</td>
</tr>
<tr>
<td>40.</td>
<td>Separation from spouse (due to work, travel, etc.).</td>
</tr>
<tr>
<td>41.</td>
<td>Engagement.</td>
</tr>
<tr>
<td>42.</td>
<td>Breaking up with partner.</td>
</tr>
<tr>
<td>43.</td>
<td>Leaving home for the first time.</td>
</tr>
<tr>
<td>44.</td>
<td>Reconciliation (making up) with partner.</td>
</tr>
<tr>
<td>45.</td>
<td>Other (please specify)</td>
</tr>
<tr>
<td>46.</td>
<td>Other (please specify)</td>
</tr>
<tr>
<td>47.</td>
<td>Other (please specify)</td>
</tr>
</tbody>
</table>
Appendix E: Questionnaire for Final Postpartum Time-Point (Time 18)

Maternal and Infant Wellbeing Study
(T18 ~ 12 months PP)

Thank you for taking the time to complete the following information.
Your responses will remain strictly confidential.

Today’s date is: ............................................

How many weeks post-birth are you at present? .............................................
GENERAL INFORMATION

1. Your Current weight....................................kilograms (*If you do not have scales at home, your local pharmacy or GP will have scales that you can use to weigh yourself)

2. During the past month, have you engaged in any form of exercise?
   (1) YES       (2) NO      (If No, please go to Q3)
   (a) If yes, please describe your exercise type (you may choose more than one):
       (1) Power-walking       (2) Walking       (3) Yoga       (4) Aerobics
       (5) Gym Circuit       (6) Team Sports       (7) Swimming       (8) Other...........
   (b) Please estimate your average total weekly exercise duration (for the past month)
       .....................minutes per week
   (c) Please describe the intensity of your exercise (over the past month) by circling one of the following:
       (1) I am slightly puffed out at the end of my exercise session
       (2) I am moderately puffed out at the end of my exercise session
       (3) I am very puffed out at the end of my exercise session

3. Over the past month How many glasses of alcohol have you consumed (on average) per week?
   (1) none       (2) one to two       (3) three to four       (4) five to six       (5) more than seven

4. What feeding practices have you been using over the past month? (please circle one)
   (1) Exclusively Breastfeeding       (2) Breastfeeding & Formula       (3) Exclusively Formula

5. Do you intend to work OR have you returned to work since the birth of your baby?
   (1) YES – I have already returned to work [please go to 5(a) below]
   (2) YES – I intend to return to work [please go to 5(a) below]
   (3) NO – I do not intend to return to work [please go to the next question]
(a) If YES, will you be working (OR are you currently working) fulltime, part time or casual?
   (1) Full-time    (2) Part-time    (3) Casual

(b) What length of maternity do you intend to (OR did you) take? .....................

6. Have you received any treatment or sought assistance from a medical or health professional in the past month: (if yes, please state why)

   (1) NO
   (2) YES – I have sought assistance from a medical professional (please specify who i.e., GP, Psychiatrist, etc) .................................................................
   (3) YES – I have sought assistance from a mental health professional (please specify who i.e., clinical psychologist, health psychologist etc) ................................................
   (4) YES – I have sought assistance from another allied health professional (please specify, i.e., naturopath, dietician etc).................................................................
Please read each statement and place a tick in the appropriate bracket to indicate how much the statement applied to you over the past month. There are no right or wrong answers. Please do not spend too much time on any statement.

The rating scale is as follows:

0  Did not apply to me at all
1  Applied to me to some degree, or some of the time
2  Applied to me to a considerable degree, or a good part of time
3  Applied to me very much, or most of the time

<table>
<thead>
<tr>
<th></th>
<th>Statement</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I found it hard to wind down</td>
<td>( )</td>
</tr>
<tr>
<td>2</td>
<td>I was aware of dryness of my mouth</td>
<td>( )</td>
</tr>
<tr>
<td>3</td>
<td>I couldn’t seem to experience any positive feeling at all</td>
<td>( )</td>
</tr>
<tr>
<td>4</td>
<td>I experienced breathing difficulty (e.g., excessively rapid breathing,</td>
<td>( )</td>
</tr>
<tr>
<td></td>
<td>breathlessness in the absence of physical exertion)</td>
<td>( )</td>
</tr>
<tr>
<td>5</td>
<td>I found it difficult to work up the initiative to do things</td>
<td>( )</td>
</tr>
<tr>
<td>6</td>
<td>I tended to over-react to situations</td>
<td>( )</td>
</tr>
<tr>
<td>7</td>
<td>I experienced trembling (e.g., in the hands)</td>
<td>( )</td>
</tr>
<tr>
<td>8</td>
<td>I felt that I was using a lot of nervous energy</td>
<td>( )</td>
</tr>
<tr>
<td>9</td>
<td>I was worried about situations in which I might panic and make a fool of</td>
<td>( )</td>
</tr>
<tr>
<td></td>
<td>myself</td>
<td>( )</td>
</tr>
<tr>
<td>10</td>
<td>I felt that I had nothing to look forward to</td>
<td>( )</td>
</tr>
<tr>
<td>11</td>
<td>I found myself getting agitated</td>
<td>( )</td>
</tr>
<tr>
<td>12</td>
<td>I found it difficult to relax</td>
<td>( )</td>
</tr>
<tr>
<td>13</td>
<td>I felt down-hearted and blue</td>
<td>( )</td>
</tr>
<tr>
<td>14</td>
<td>I was intolerant of anything that kept me from getting on with what I</td>
<td>( )</td>
</tr>
<tr>
<td></td>
<td>was doing</td>
<td>( )</td>
</tr>
<tr>
<td>15</td>
<td>I felt I was close to panic</td>
<td>( )</td>
</tr>
<tr>
<td>16</td>
<td>I was unable to become enthusiastic about anything</td>
<td>( )</td>
</tr>
<tr>
<td>17</td>
<td>I felt I wasn’t worth much as a person</td>
<td>( )</td>
</tr>
<tr>
<td>18</td>
<td>I felt that I was rather touchy</td>
<td>( )</td>
</tr>
<tr>
<td>19</td>
<td>I was aware of the action of my heart in the absence of physical exertion</td>
<td>( )</td>
</tr>
<tr>
<td></td>
<td>(e.g., sense of heart rate increase, heart missing a beat)</td>
<td>( )</td>
</tr>
<tr>
<td>20</td>
<td>I felt scared without any good reason</td>
<td>( )</td>
</tr>
<tr>
<td>21</td>
<td>I felt that life was meaningless</td>
<td>( )</td>
</tr>
</tbody>
</table>
Please place a tick *in the bracket* next to the answer which comes closest to how you have felt *over the past month*, not just how you feel today.

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have been able to laugh and see the funny side of things.</td>
<td>6. Things have been getting on top of me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As much as I always could</td>
<td>( )</td>
<td>Yes, most of the time I haven’t been able to cope at all</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not quite so much now</td>
<td>( )</td>
<td>Yes, sometimes I haven’t been coping as well as usual</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Definitely not so much now</td>
<td>( )</td>
<td>Not, most of the time I have coped quite well</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>( )</td>
<td>No, I have been coping as well as ever</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I have looked forward with enjoyment to things.</td>
<td>7. I have been so unhappy that I have had difficulty sleeping.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As much as I ever did</td>
<td>( )</td>
<td>Yes, most of the time</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rather less than I used to</td>
<td>( )</td>
<td>Yes, sometimes</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Definitely less than I used to</td>
<td>( )</td>
<td>Not very often</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardly at all</td>
<td>( )</td>
<td>No, not at all</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I have blamed myself unnecessarily when things went wrong.</td>
<td>8. I have felt sad or miserable.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, most of the time</td>
<td>( )</td>
<td>Yes, most of the time</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, some of the time</td>
<td>( )</td>
<td>Yes, quite often</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not very often</td>
<td>( )</td>
<td>Not very often</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No, never</td>
<td>( )</td>
<td>No, not at all</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I have been anxious or worried for no good reason.</td>
<td>9. I have been so unhappy that I have been crying.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No, not at all</td>
<td>( )</td>
<td>Yes, most of the time</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardly ever</td>
<td>( )</td>
<td>Yes, quite often</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, sometimes</td>
<td>( )</td>
<td>Only occasionally</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, very often</td>
<td>( )</td>
<td>No, never</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I have felt scared or panicky for no very good reason.</td>
<td>10. The thought of harming myself has occurred to me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, quite a lot</td>
<td>( )</td>
<td>Yes, quite often</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, sometimes</td>
<td>( )</td>
<td>Sometimes</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No, not much</td>
<td>( )</td>
<td>Hardly ever</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No, not at all</td>
<td>( )</td>
<td>Never</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Please tick **ONE** set of brackets to indicate how much you agree/disagree with each statement in relation to how you have felt over the past month.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree (0)</th>
<th>Disagree (1)</th>
<th>Agree (2)</th>
<th>Strongly Agree (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. On the whole I am satisfied with myself.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2. At times I am no good at all.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3. I feel that I have a number of good qualities.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>4. I am able to do things as well as most other people.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>5. I feel I do not have much to be proud of.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>6. I certainly feel useless at times.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>7. I feel I am a person of worth, at least on equal plane of others.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>8. I wish I could have more respect for myself.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>9. All in all I am inclined to think I am a failure.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>10. I take a positive attitude toward myself.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>
The following statements relate to your relationship with your husband/partner. Please read each statement and then place a tick in the bracket that corresponds to how strongly you agree/disagree with each statement.

<table>
<thead>
<tr>
<th>How often do you and your partner agree on:</th>
<th>Always Agree</th>
<th>Almost Always Agree</th>
<th>Occasionally Disagree</th>
<th>Frequently Disagree</th>
<th>Almost Always Disagree</th>
<th>Always Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Handling family finances</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2. Matters of recreation</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3. Religious matters</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>4. Demonstrations of Affection</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>5. Friends</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>6. Sex relations</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>7. Conventionality (correct or 'proper' behavior)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>8. Philosophy of life</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>9. Ways of dealing with parents or in-laws</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>10. Aims, goals, and things believed important</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>11. Making major decisions</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>12. Amount of time spent together</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>13. Household tasks</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>14. Leisure time interests and activities</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>15. Career decisions</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>All the time (5)</th>
<th>Most of the time (4)</th>
<th>More often than not (3)</th>
<th>Occasionally (2)</th>
<th>Rarely (1)</th>
<th>Never (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. How often do you discuss or have you considered divorce, separation, or terminating your relationship?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>17. How often do you/your partner leave the house after a fight?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>18. In general, how often do you think that things between you and your partner are going well?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>19. Do you confide in your partner?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>20. Do you ever regret that you married (or lived together)?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>21. How often do you and your partner argue?</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>22. How often do you and your partner “get on each others’ nerves?”</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>
23. Do you kiss your partner?  
( ) ( ) ( ) ( ) ( )

24. Do you and your partner engage in outside interests together?  
( ) ( ) ( ) ( ) ( )

How often would you say the following events occur between you and your partner?  

<table>
<thead>
<tr>
<th>Event</th>
<th>Never</th>
<th>Less than once a month</th>
<th>Once or twice a month</th>
<th>Once or twice a week</th>
<th>Once a day</th>
<th>More often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have a stimulating exchange of ideas</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Laugh together</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Calmly discuss something</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Work together on a project</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

There are some things about which couples sometimes agree and sometimes disagree. Please indicate if either item below caused differences of opinions or were problems in your relationship during the past month.  

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>29. Being too tired for sex.</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>30. Not showing love.</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

31. The dots on the following line represent different degrees of happiness in a relationship. The middle point, “happy,” represents the degree of happiness of most relationships. Please circle the dot which best describes the degree of happiness, all things considered, of your current relationship.  

<table>
<thead>
<tr>
<th>Extremely Unhappy</th>
<th>Fairly Unhappy</th>
<th>A Little Unhappy</th>
<th>Happy</th>
<th>Very Happy</th>
<th>Extremely Happy</th>
<th>Perfect</th>
</tr>
</thead>
</table>

32. Which one of the following statements best describes how you feel about the future of your relationship? (please place a tick next to the appropriate statement)  

_______ I want desperately for my relationship to succeed, and would go to almost any length to see that it does.  
_______ I want very much for my relationship to succeed, and will do all I can to see that it does.  
_______ I want very much for my relationship to succeed, and will do my fair share to see that it does.  
_______ It would be nice if my relationship succeeded, but I can’t do much more than I am doing now to help it succeed.  
_______ It would be nice if it succeeded, but I refuse to do any more than I am doing now to keep the relationship going.  
_______ My relationship can never succeed, and there is no more that I can do to keep the relationship going.
The following statements relate to the way you feel about the people in your life. Please read each statement and then **place a tick in the bracket** that correspond to how strongly you agree with the statement.

<table>
<thead>
<tr>
<th></th>
<th>Very Strongly Agree (7)</th>
<th>Agree (6)</th>
<th>Mildly Agree (5)</th>
<th>Neutral (4)</th>
<th>Mildly Disagree (3)</th>
<th>Disagree (2)</th>
<th>Very Strongly Disagree (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>There is a special person who is around when I am in need.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2.</td>
<td>There is a special person with whom I can share my joys and sorrows.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3.</td>
<td>My family really tries to help me.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>4.</td>
<td>I get the emotional help and support I need from my family.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>5.</td>
<td>I have a special person who is a real source of comfort to me.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>6.</td>
<td>My friends really try to help me.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>7.</td>
<td>I can count on my friends when things go wrong.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>8.</td>
<td>I can talk about my problems with my family.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>9.</td>
<td>I have friends with whom I can share my joys and sorrows.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>10.</td>
<td>There is a special person in my life who cares about my feelings.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>11.</td>
<td>My family is willing to help me make decisions.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>12.</td>
<td>I can talk about problems with my friends.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>
The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month.

**During the past month:**

1. What time have you usually gone to bed?  
2. How long (in minutes) has it taken you to fall asleep each night?  
3. What time have you usually gotten up in the morning?  
4. How many hours of actual sleep do you usually get that night? (This may be different than the number of hours you spend in bed)  
5. During the past month, how often have you had trouble sleeping because you:  
   a. Cannot get to sleep within 30 minutes  
   b. Wake up in the middle of the night or early morning  
   c. Have to get up to use the bathroom  
   d. Cannot breathe comfortably  
   e. Cough or snore loudly  
   f. Feel too cold  
   g. Feel too hot  
   h. Have bad dreams  
   i. Have pain or physical discomfort  
   j. Other reason(s), please describe, including how often you have had trouble sleeping because of this:  
6. During the past month, how often have you taken medicine (prescribed or ‘over the counter’) to help you sleep?  
7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activities?  
8. During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?  
9. During the past month, how would you rate your sleep quality overall?  

| During the past month, how often have you had trouble sleeping because you: |
|----------------------------------|--------------------|-------------------|-----------------|-----------------|
| a. Cannot get to sleep within 30 minutes | Not during the past month | Less than once a week | Once or twice a week | Three or more times a week |
| b. Wake up in the middle of the night or early morning | ( ) | ( ) | ( ) | ( ) |
| c. Have to get up to use the bathroom | ( ) | ( ) | ( ) | ( ) |
| d. Cannot breathe comfortably | ( ) | ( ) | ( ) | ( ) |
| e. Cough or snore loudly | ( ) | ( ) | ( ) | ( ) |
| f. Feel too cold | ( ) | ( ) | ( ) | ( ) |
| g. Feel too hot | ( ) | ( ) | ( ) | ( ) |
| h. Have bad dreams | ( ) | ( ) | ( ) | ( ) |
| i. Have pain or physical discomfort | ( ) | ( ) | ( ) | ( ) |
| j. Other reason(s), please describe, including how often you have had trouble sleeping because of this: | ( ) | ( ) | ( ) | ( ) |

| During the past month, how often have you taken medicine (prescribed or ‘over the counter’) to help you sleep? |
|--------------------------------------------------|--------|--------|--------|--------|
| Not during the past month | Less than once a week | Once or twice a week | Three or more times a week |
| ( ) | ( ) | ( ) | ( ) |

| During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done? |
|--------------------------------------------------|--------|--------|--------|--------|
| Very Good | Fairly Good | Often Bad | Always Bad |
| ( ) | ( ) | ( ) | ( ) |

| During the past month, how would you rate your sleep quality overall? |
|--------------------------------------------------|--------|--------|--------|--------|
| Very Good | Fairly Good | Often Bad | Always Bad |
| ( ) | ( ) | ( ) | ( ) |
The following questions ask you to indicate what you generally do and feel when you experience stressful events. Obviously, different events can bring out different responses, but please think about what you have usually done over the past month when you have been under a lot of stress. Please respond to each of the following items by placing a tick in the appropriate set of brackets. Please try to respond to each item separately in your mind from each other, and answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for you—not what you think "most people" would say or do.

<table>
<thead>
<tr>
<th></th>
<th>I usually don't do this at all</th>
<th>I usually do this a little bit</th>
<th>I usually do this a medium amount</th>
<th>I usually do this a lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I try to grow as a person as a result of the experience.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2.</td>
<td>I turn to work or other activities to take my mind off things.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3.</td>
<td>I get upset and let my emotions out.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>4.</td>
<td>I try to get advice from someone about what to do.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>5.</td>
<td>I concentrate my efforts on doing something about it.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>6.</td>
<td>I say to myself &quot;this isn't real&quot;</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>7.</td>
<td>I put my trust in God.</td>
<td>( )</td>
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<tr>
<td>8.</td>
<td>I laugh about the situation.</td>
<td>( )</td>
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<tr>
<td>9.</td>
<td>I admit to myself that I can't deal with it, and quit trying.</td>
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</tr>
<tr>
<td>10.</td>
<td>I restrain myself from doing anything too quickly.</td>
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<tr>
<td>11.</td>
<td>I discuss my feelings with someone.</td>
<td>( )</td>
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<tr>
<td>12.</td>
<td>I use alcohol or drugs to make myself feel better.</td>
<td>( )</td>
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<tr>
<td>13.</td>
<td>I get used to the idea that it happened.</td>
<td>( )</td>
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<tr>
<td>14.</td>
<td>I talk to someone to find out more about the situation.</td>
<td>( )</td>
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<tr>
<td>15.</td>
<td>I keep myself from getting distracted by other thoughts or activities.</td>
<td>( )</td>
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</tr>
<tr>
<td>16.</td>
<td>I daydream about other things.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>17.</td>
<td>I get upset, and am really aware of it.</td>
<td>( )</td>
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<tr>
<td>18.</td>
<td>I seek God's help.</td>
<td>( )</td>
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<tr>
<td>19.</td>
<td>I make a plan of action.</td>
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<tr>
<td>20.</td>
<td>I make jokes about it.</td>
<td>( )</td>
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<tr>
<td>21.</td>
<td>I accept that this has happened and that it can't be changed.</td>
<td>( )</td>
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</tr>
<tr>
<td>22.</td>
<td>I hold off doing anything about it until the situation permits.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>23.</td>
<td>I try to get emotional support from friends or relatives.</td>
<td>( )</td>
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</tr>
<tr>
<td>24.</td>
<td>I just give up trying to reach my goal.</td>
<td>( )</td>
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</tr>
<tr>
<td>25.</td>
<td>I take additional action to try to get rid of the problem.</td>
<td>( )</td>
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</tr>
<tr>
<td>26.</td>
<td>I try to lose myself for a while by drinking alcohol or taking drugs.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>27.</td>
<td>I refuse to believe that it has happened.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>28.</td>
<td>I let my feelings out.</td>
<td>( )</td>
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</tr>
<tr>
<td></td>
<td>I usually don’t do this at all (1)</td>
<td>I usually do this a little bit (2)</td>
<td>I usually do this a medium amount (3)</td>
<td>I usually do this a lot (4)</td>
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<tr>
<td>29</td>
<td>I try to see it in a different light, to make it seem more positive.</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>30</td>
<td>I talk to someone who can do something concrete about the problem.</td>
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<tr>
<td>31</td>
<td>I sleep more than usual.</td>
<td>( )</td>
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<tr>
<td>32</td>
<td>I try to come up with a strategy about what to do.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>33</td>
<td>I focus on dealing with this problem, and if necessary let other things slide a little.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>34</td>
<td>I get sympathy and understanding from someone.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>35</td>
<td>I drink alcohol or take drugs, in order to think about it less.</td>
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<tr>
<td>36</td>
<td>I kid around about it.</td>
<td>( )</td>
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<tr>
<td>37</td>
<td>I give up the attempt to get what I want.</td>
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<tr>
<td>38</td>
<td>I look for something good in what is happening.</td>
<td>( )</td>
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<tr>
<td>39</td>
<td>I think about how I might best handle the problem.</td>
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<tr>
<td>40</td>
<td>I pretend that it hasn’t really happened.</td>
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<tr>
<td>41</td>
<td>I make sure not to make matters worse by acting too soon.</td>
<td>( )</td>
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<tr>
<td>42</td>
<td>I try hard to prevent other things from interfering with my efforts at dealing with this.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>43</td>
<td>I go to movies or watch TV, to think about it less.</td>
<td>( )</td>
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<tr>
<td>44</td>
<td>I accept the reality of the fact that it happened.</td>
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<tr>
<td>45</td>
<td>I ask people who have had similar experiences what they did.</td>
<td>( )</td>
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<tr>
<td>46</td>
<td>I feel a lot of emotional distress and I find myself expressing those feelings a lot.</td>
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<tr>
<td>47</td>
<td>I take direct action to get around the problem.</td>
<td>( )</td>
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<tr>
<td>48</td>
<td>I try to find comfort in my religion.</td>
<td>( )</td>
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<tr>
<td>49</td>
<td>I force myself to wait for the right time to do something.</td>
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<tr>
<td>50</td>
<td>I make fun of the situation.</td>
<td>( )</td>
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<tr>
<td>51</td>
<td>I reduce the amount of effort I put into solving the problem.</td>
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<tr>
<td>52</td>
<td>I talk to someone about how I feel.</td>
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<tr>
<td>53</td>
<td>I use alcohol or drugs to help me get through it.</td>
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<tr>
<td>54</td>
<td>I learn to live with it.</td>
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<tr>
<td>55</td>
<td>I put aside other activities in order to concentrate on this.</td>
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<tr>
<td>56</td>
<td>I think hard about what steps to take.</td>
<td>( )</td>
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<tr>
<td>57</td>
<td>I act as though it hasn’t even happened.</td>
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</tr>
<tr>
<td>58</td>
<td>I do what has to be done, one step at a time.</td>
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<tr>
<td>59</td>
<td>I learn something from the experience.</td>
<td>( )</td>
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<tr>
<td>60</td>
<td>I pray more than usual.</td>
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</tr>
</tbody>
</table>
The following questions relate to how you think and feel about your current life situation and your role as a mother. When answering the questions, **please think about the period of time that has lapsed from the day you gave birth, until today.** Answer each question by placing a tick in the appropriate bracket.

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all (1)</th>
<th>Slightly (2)</th>
<th>Moderately (3)</th>
<th>Considerably (4)</th>
<th>Extremely (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is this a totally hopeless situation?</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>2. Does this situation create tension in me?</td>
<td>( )</td>
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<tr>
<td>3. Is the outcome of this situation uncontrollable by anyone?</td>
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<tr>
<td>4. Is there someone or some agency I can turn to for help if I need it?</td>
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<tr>
<td>5. Does this situation make me feel anxious?</td>
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<tr>
<td>6. Does this situation have important consequences for me?</td>
<td>( )</td>
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<tr>
<td>7. Is this going to have a positive impact on me?</td>
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<tr>
<td>8. How eager am I to tackle this problem?</td>
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<tr>
<td>9. How much will I be affected by the outcome of this situation?</td>
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<tr>
<td>10. To what extent can I become a stronger person because of this situation?</td>
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<tr>
<td>11. Will the outcome of this situation be negative?</td>
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<tr>
<td>12. Do I have the ability to do well in this situation?</td>
<td>( )</td>
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<tr>
<td>13. Does this situation have serious implications for me?</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>14. Do I have what it takes to do well in this situation?</td>
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<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>15. Is there help available to me for dealing with this situation?</td>
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</tr>
<tr>
<td>16. Does this situation tax or exceed my coping resources?</td>
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<tr>
<td>17. Are there sufficient resources available to help me in dealing with this situation?</td>
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</tr>
<tr>
<td>18. Is it beyond anyone’s power to do anything about this situation?</td>
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</tr>
<tr>
<td>19. To what extent am I excited thinking about the outcome of this situation?</td>
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<tr>
<td>20. How threatening is this situation?</td>
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<tr>
<td>21. Is the problem unresolvable by anyone?</td>
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<tr>
<td>22. Will I be able to handle the situation?</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>23. Is there anyone who can help me to manage this situation?</td>
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</tr>
<tr>
<td>24. To what extent do I perceive this situation as stressful?</td>
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<tr>
<td>25. Do I have the skills necessary to achieve a successful outcome to this situation?</td>
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<tr>
<td>26. To what extent does this situation require coping efforts on my part?</td>
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<tr>
<td>27. Does this situation have long-term consequences for me?</td>
<td>( )</td>
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</tr>
<tr>
<td>28. Is this going to have a negative impact on me?</td>
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</tr>
</tbody>
</table>
The following is a list of events which may bring about changes in the lives of those who experience them. Please read through the list and for those that have occurred, please tell me the extent to which you view the event as having either a positive or negative impact on your life at the time the event occurred. Leave blank if the event did not occur in the past year.

<table>
<thead>
<tr>
<th>Extremely Negative</th>
<th>Moderately Negative</th>
<th>Somewhat Negative</th>
<th>No Impact</th>
<th>Somewhat Positive</th>
<th>Moderately Positive</th>
<th>Extremely Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
<td>+1</td>
<td>+2</td>
<td>+3</td>
</tr>
</tbody>
</table>

In the past year did the following occur? (Leave blank if the event did not occur in the past year.)

1. Marriage or setting up household with partner.
2. Detention in jail or comparable institution.
3. Death of a spouse/partner.
4. Major change in sleeping habits (much less or more sleep).
5. Death of a close family member.
6. Major change in eating habits (much more or less food intake).
7. Foreclosure on mortgage or loan.
8. Death of a close friend.
10. Minor law violations (traffic tickets, disturbing the peace, etc.).
11. You or your partner got pregnant.
12. Change work situation (different work responsibility, major change in working conditions, hours, etc.).
14. Serious illness or injury of close family member.
15. Sexual difficulties.
16. Trouble with employer (in danger of losing job, being suspended, demoted, etc.).
17. Trouble with in-laws.
18. Major change in financial status (much better/worse off).
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>19.</td>
<td>Major change in closeness of family members (increased or decreased closeness).</td>
</tr>
<tr>
<td>20.</td>
<td>Gaining a new family member (through birth, adoption, family member moving in, etc.).</td>
</tr>
<tr>
<td>22.</td>
<td>Separation from partner (due to conflict).</td>
</tr>
<tr>
<td>23.</td>
<td>Major change in church activities (increased or decreased attendance).</td>
</tr>
<tr>
<td>24.</td>
<td>Reconciliation (making up) with partner.</td>
</tr>
<tr>
<td>25.</td>
<td>Major change in number of arguments with partner (a lot more or a lot fewer arguments)</td>
</tr>
<tr>
<td>26.</td>
<td>Change in spouse/partner’s work (loss of job, beginning new job, retirement, etc.).</td>
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<tr>
<td>27.</td>
<td>Major change in usual type and/or amount of recreation.</td>
</tr>
<tr>
<td>28.</td>
<td>Borrowing more than $100,000 (buying home, business, etc.).</td>
</tr>
<tr>
<td>29.</td>
<td>Borrowing less than $100,000 (buying car, RV, getting school loan, etc.).</td>
</tr>
<tr>
<td>30.</td>
<td>Being fired from job.</td>
</tr>
<tr>
<td>31.</td>
<td>You or your spouse/partner had an abortion.</td>
</tr>
<tr>
<td>32.</td>
<td>Major personal illness or injury.</td>
</tr>
<tr>
<td>33.</td>
<td>Major change in social activities, such as parties, movies, visiting (increased or decreased participation).</td>
</tr>
<tr>
<td>34.</td>
<td>Major change in family living conditions (building new home, remodeling, deterioration of home, neighborhood).</td>
</tr>
<tr>
<td>35.</td>
<td>Divorce.</td>
</tr>
<tr>
<td>36.</td>
<td>Serious injury or illness of a close friend.</td>
</tr>
<tr>
<td>37.</td>
<td>Retirement from work.</td>
</tr>
<tr>
<td>38.</td>
<td>Son or daughter leaving home (due to marriage, college, etc.)</td>
</tr>
<tr>
<td>39.</td>
<td>End of formal schooling.</td>
</tr>
<tr>
<td>40.</td>
<td>Separation from spouse (due to work, travel, etc.)</td>
</tr>
<tr>
<td>41.</td>
<td>Engagement.</td>
</tr>
<tr>
<td>42.</td>
<td>Breaking up with boyfriend/girlfriend.</td>
</tr>
<tr>
<td>43.</td>
<td>Leaving home for the first time.</td>
</tr>
<tr>
<td>44.</td>
<td>Reconciliation (making up) with partner.</td>
</tr>
<tr>
<td>45.</td>
<td>Other (please specify)</td>
</tr>
<tr>
<td>46.</td>
<td>Other (please specify)</td>
</tr>
<tr>
<td>47.</td>
<td>Other (please specify)</td>
</tr>
</tbody>
</table>