



**DEPARTMENT OF PSYCHOLOGY**  
**DOCTORATE IN CLINICAL AND COMMUNITY PSYCHOLOGY**

**MAJOR RESEARCH PROJECT**

**&**

**LITERATURE REVIEW**

**Effects of Rumination on Problem-Solving, Mood and Confidence in Post-natal  
Dysphoria**

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# **Effects of Rumination on Problem-Solving, Mood & Confidence in Post-natal**

## **Dysphoria**

### **Introduction**

It is estimated that post-natal depression (PND) between 10-15% of women (Cox, Murray & Chapman, 1993; Lane et al., 1997) and has been associated with adverse effects for both the mother and child (Gelfeld & Tetti, 1990; Murray & Cooper, 1996; Cornish et al., 2005). There is a paucity of research investigating the specific mechanisms that impact and influence PND and the mother-infant relationship. This area of investigation is important because research has highlighted maternal psychopathology affects not only the mother-infant relationship but holds subsequent negative long-term outcomes for the emotional, social and cognitive development for children, which remain even after PND is treated (Murray et al., 1999; Hay et al., 2001; Cornish et al., 2005; Pawlby, Sharp, Hay & Keane, 2008; Murray et al., 2010).

A considerable amount of depression-focused research has investigated the link between depression and rumination and the existence of ruminative thinking within depressed individuals (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008; Smith & Alloy, 2009). However, little is known specifically about the role of rumination in PND and whether it may impact specifically on parenting. This literature review focuses upon research into the effects of rumination, rumination's influence in problem-solving and the potential impact of rumination and depression on parenting within the post-natal period. The review highlights the lack of research regarding rumination and problem-solving in the post-natal period and as a result later proposes research in this area.

## **Rumination**

Nolen-Hoeksema (1991) defines rumination as “behaviours and thoughts that focus one’s attention on one’s depressive symptoms and on the implications of these symptoms” (p569).

Rumination is characterised by abstract evaluative recurrent thought processes and has been associated with the overgeneralisation of thoughts and memories (Watkins, 2008). It involves repetitively and passively focusing upon symptoms of personal distress and the meaning associated with those symptoms without any focus on possible action to alleviate these symptoms (Nolen-Hoeksema, 2004; Nolen-Hoeksema et al., 2008).

Nolen-Hoeksema (1991) proposed a response styles theory that suggests ruminative thinking maintains and intensifies depression by increasing negative thinking, impairs effective problem-solving and interferes with instrumental behaviour. In the context of depressed mood, the theory proposes that rumination exacerbates and prolongs depressive symptoms and increases the chronicity of symptoms as well as the likelihood that moderate symptoms will develop into a major depressive episode. Firstly, it is proposed that rumination prolongs depression by activating negative thinking so an individual is more likely to use negative thoughts to understand their circumstances. Secondly, rumination interferes with problem-solving, partly due to increasing pessimistic and fatalistic thinking. Thirdly, rumination interferes with instrumental behaviour, and lastly, that ongoing ruminators may lose social support leading to an increase in depressive symptoms (Nolen-Hoeksema, 2004; Nolen-Hoeksema et al., 2008).

Rumination has been likened to other depressive cognitive constructs, such as preoccupation (Papageorgiou & Wells, 2004). Preoccupation or rumination focuses an individual’s attention inward, potentially narrowing their overall attention, which may lead to a reduced responsiveness to their environment. As a result, rumination in post-natal women may hold negative consequences for caring for an infant.

## **Rumination and Problem-Solving**

Nolen-Hoeksema (1991) proposed that rumination affects problem-solving by increasing the accessibility of negative cognitions and that these negative cognitions interfere with the initiation of positive behaviour, this in turn leads to the inability to solve problems. A number of studies have investigated the effects of rumination on problem-solving by inducing dysphoric and non-dysphoric students to ruminate or distract from self-focused negative thoughts before completing tasks. Lyubomirsky and Nolen-Hoeksema (1995) used a modified version of the Means Ends Problem-Solving task (MEPS; Platt & Spivack, 1975) to investigate the effects of rumination and distraction on problem-solving in dysphoric and non-dysphoric students. Results indicated that the dysphoric ruminative group showed poorer problem-solving ability than the dysphoric distracters group and both the non-dysphoric ruminators and distracters. The dysphoric distraction group's responses were equal to both the non-dysphoric ruminators and distracters; indicating that rumination in the presence of dysphoria affects problem-solving. Lyubomirsky, Tucker, Caldwell & Berg, (1999) also found that dysphoric ruminators were rated as significantly lower in problem-solving effectiveness than dysphoric distracters, non-dysphoric ruminators and non-dysphoric distracters on a modified MEPS task. Further support for the effects of rumination on problem-solving is provided by Kao, Dristchel and Astell (2006).

While these studies highlight potential implications of rumination on social problem-solving they were conducted using a student population. The Beck Depression Inventory (BDI, Beck, Steer & Garbin, 1988) was used to assess dysphoria and has been criticised as a measure of non-specific negative affect rather than depression (Kendall, Hollon, Beck, Hamen & Ingram, 1987). The BDI does, however have good reliability and validity (Beck, et al., 1988). Although the participants were dysphoric as opposed to depressed, consideration of co-morbidity with other mood disorder was not given and as a result the rumination

induction may have had additional effects upon anxiety and other negative mood states in the dysphoric group. This may have held additional implications for problem-solving efficacy.

Replication of the influence of rumination on problem-solving ability has been additionally seen among clinical populations. Donaldson and Lam (2004) investigated the effects of trait and induced rumination and trait and induced distraction on social problem-solving using the MEPS in major depression versus a control group. Results indicated that trait and induced rumination resulted in poorer mood and problem-solving for depressed participants, with no effect for the control group. For the depressed group trait distraction had no effects but induced distraction improved mood and improved problem-solving where participants level of rumination was not considered to be occurring at a high level (as assessed by the Response Style Questionnaire (RSQ) Nolen-Hoeksema & Morrow, 1991). These results show some support for the benefits of induced distraction on problem-solving, however, they also highlight the overriding impact of rumination if it is occurring at a high level. This may have important implications for PND where distraction interventions may improve problem-solving and mood. However, the study also highlights the need to consider elevated levels of trait rumination for PND interventions.

Watkins and Baracaia (2002) undertook a study using the MEPS into the effect of trait and state orientated rumination with individuals with current depression, past depression and those with no depression history. Experimental manipulation involved focusing on either state-orientated questions (e.g. “What am I doing wrong”) or process-focused questions (e.g. “How am I deciding on a way to solve this problem?”) as well as a no question condition. Results indicated that the currently depressed group was poorer at problem-solving than the recovered-depressed and never-depressed groups. For the depressed group, process-focused questions improved problem-solving as compared to state-orientated and no questions conditions. For the recovered depressed group the state-orientated questions also

detrimentally affected their problem-solving ability as compared to the process-focused questions. This study provides insight into the detrimental effects of abstract state-orientated thinking in rumination and the potential benefits of process-focused questions in assisting problem-solving. However, due to the hypothetical nature of MEPS questions, process-focused questions may not hold such benefits in real life situations.

McMurrich and Johnson (2008) found that a history of a major depressive disorder and a negative problem-solving orientation were significantly related to higher levels of rumination. A depressive history is additionally a risk factor for PND (O'Hara & Swain, 1996) and these findings may suggest post-natal women with a depressive history are thus vulnerable to rumination. However, it is important to note that there was not a mediating effect of negative problem-solving orientation and rumination, rather they were both independently related to a history of depression. Therefore, it is difficult to establish if rumination and negative problem-solving orientation are just indicators of having experienced depression in the past or whether a future depressive episode could be predicted. Additional limitations may be drawn from the relatively small sample size used for multidimensional analyses.

### **Further Effects of Rumination**

In line with the response styles theory, experimental studies have shown that dysphoric individuals induced to ruminate experience an increase in depressive symptoms and lower mood (Nolen-Hoeksema & Morrow, 1993; Lyubomirsky & Nolen-Hoeksema, 1995; Donaldson & Lam, 2004). Self-rumination reports have also been linked to prolonged periods of distress and depressive episodes (Nolen-Hoeksema & Morrow, 1991) across a variety of populations, including children and older adults (Abela, Brozina & Haigh, 2002; Kraaij, Pruyboom & Garnefski, 2002).

Furthermore, ruminative thinking has been linked to increases in depressive symptoms after major life events. Nolen-Hoeksema and Morrow (1991) found that students with greater rumination and depression scores were more likely to be depressed ten days and seven weeks following the 1989 Loma Prieta earthquake. A ruminative response one month following the bereavement of a loved one has also been associated with greater depressive symptoms at six months following the loss. Furthermore, a ruminative coping style was also linked to greater reports of life stressors and greater social isolation (Nolen-Hoeksema, Parker & Larson, 1994). This literature may have implications for how a woman copes with the life-changing event of becoming a mother.

Lyubomirsky and Nolen-Hoeksema (1993) found that depressed individuals were slower to engage in distracting activities despite recognising that the activities would assist their mood. They note that this may be a result of rumination's focus on negative symptoms leading to a belief they lack the self-efficacy to participate in mood-lifting activities. Lyubomirsky et al. (1999) found that dysphoric students induced to ruminate did not report generating what they felt were less effective problem solutions or confidence in their solutions compared to dysphoric distracter or non-dysphoric groups but they were less likely to implement their solutions. Thus it may be argued that rumination saps one's motivation to make changes and potentially relieve low mood. Furthermore, they found that dysphoric ruminator's expressed thoughts were more negative, had greater focus upon personal problems, were significantly more self-critical, less confident, held more self-blame, reduced optimism and diminished feelings of control than non-dysphoric ruminators. This study does hold limitations in terms of an ability to generalise among clinical populations. It also raises questions regarding the difficulty in experimentally generating thought processes behind rumination. Nonetheless, they suggest that rumination in the presence of dysphoria may affect problem-solving by interfering with the thinking processes needed to identify and

implement effective solutions as well as confidence and motivation to implement solutions. This in turn may hold important consequences for confidence and motivation towards parenting problems among women suffering from PND.

Furthermore, Ward, Lyubomirsky, Sousa and Nolen-Hoeksema (2003) undertook two studies investigating initiation and problem-solving in the presence of rumination. To investigate, more habitual rumination participants were chosen based upon responses to the RSQ (Nolen-Hoeksema & Morrow, 1991). Results indicated that ruminators were less satisfied, less confident, showed greater negative thoughts and were less committed to their problem-solving plans. Additionally they required more time before feeling comfortable with their plans and were more likely to show evidence of dwelling on plans. However, the correlational nature of this study means that it is unable to infer causality. Additionally an alternative explanation for the findings might be that uncertainty leads individuals to ruminate. The self report nature of the RSQ is also open to methodological difficulties in how individuals report their responses to mood. In addition to this, the study involved a relatively small sample size and, as a result, its statistical power could be questioned. Despite this, the study highlights potential difficulties a mother may face if ruminating while caring for an infant. Looking after an infant can often present parents with ambiguous situations which need to be actioned quickly, this may lead to greater uncertainty and reduced confidence in a mother's ability to manage the demands of an infant, resulting in further rumination and lower mood.

### **Cognitive Processes and Rumination**

Lyubomirsky, Kasri, and Zehm (2003) investigated the effects of rumination on concentration, results highlighted that dysphoric participants induced to ruminate reported more difficulty concentrating and significantly more interfering thoughts on academic tasks

than dysphoric participants induced to distract (who became less dysphoric). Other research has suggested ruminators pay more attention to their negative thoughts, which may interfere with everyday functioning due to their absorbing compelling and self-perpetuating nature with wide-reaching consequences such as not paying attention to others leading to greater friction in relationships (Lyubomirsky & Tkach, 2004). Post-natal research highlights that depressed mothers spend less time looking, touching, engaging and playing with their infants (Field 2010), which may highlight the difficulties for mothers in attending to their infants in the presence of rumination.

Van Radenborgh, de Jong Meyer and Huffmeier (2009) further found that dysphoric rumination resulted in greater indecision and reduced confidence in decision-making, particularly in social decision-making. However, these results were not consistently seen across all problem-solving paradigms and like other research in this area involved dysphoric participants as opposed to a clinical population. Davis and Nolen-Hoeksema (2000) proposed one reason why people might ruminate despite recognising its negative consequences, is that rumination may foster cognitive inflexibility. They found that ruminators committed more errors on the Wisconsin Card Sorting Task and found it harder to maintain an adaptive set, suggesting that ruminators become mentally stuck in a style despite non-validation from environmental feedback.

## **Rumination and Gender**

Research indicates that women are more likely to engage in ruminative coping styles than men and this may hold implications for women in the perinatal/post-natal period. Nolen-Hoeksema (1991) originally proposed the response styles theory to account for the gender differences in depression rates. Prevalence rates indicate that women are twice as likely as men to suffer from depression and females report significantly higher levels of depressed

mood than males (Nolen-Hoeksema, 1994; 2002). Nolen-Hoeksema proposed the potential reason for this difference was that women may feel they have less control over their emotions, feel greater responsibility for their relationships and perceive themselves to be lower in mastery. If women place a greater focus on the emotional tone of their relationships and, as a result, are vigilant to every nuance of their relationships for both their emotional states and others (Nolen-Hoeksema, 2004), this may render a mother hypersensitive to the cues from their baby. A recent study by Stein et al., (2010) found that depressed mothers exposed to prolonged negative expressions on infant faces were more likely to rate and interpret the infant faces more negatively than non-depressed or anxious mothers. This bias may in turn affect the nature of their responsiveness towards their infants and when coupled with low mastery and over-generalisation in their thought processes, may lead a post-natally depressed mother to feel they are unable to meet the perceived demands of their baby and become caught up in a ruminative cycle.

A number of studies provided support for Nolen-Hoeksema's (1991) theory and as a result it has been suggested that rumination may mediate the gender gap in depression (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema, Larson & Grayson, 1999; Jose & Brown, 2008).

### **Cognitive Processes in the Perinatal and Post-natal Period**

A negative cognitive attributional and a dysfunctional cognitive style have been identified as risk factors for post-natal depression (O'Hara & Swain, 1996) and it could be argued that these cognitive styles would render a perinatally depressed individual susceptible to rumination (Wenzlaff, 2004). It therefore appears important to consider literature investigating cognitive processes and thinking within the perinatal and post-natal period.

The rumination literature has highlighted reduced confidence, self-efficacy and increases in self-criticism and blame as consequences of rumination. Research within the perinatal period have shown that where mothers lack confidence in their own ability and perceive their parental efficacy as low they are more likely to experience PND. For example, Hipwell, Reynolds and Crick (2004) investigated the possibility of a cognitive vulnerability to post-natal depressive symptomatology and found that a tendency to self-devalue predicted depressed mood eight weeks postpartum. This suggests that self-devaluation may reduce feelings of self-worth and efficacy particularly in the context of stressful events such as the birth of a new baby. This coupled with potential female vulnerability towards ruminative thinking and overgeneralisation of thoughts may result in self-devaluation leading to rumination and depression post-natally. Teti & Gelfand (1991) found that mothers' self-reported efficacy was significantly correlated with maternal depression, indicating that where mothers' suffer from depression they are more likely to perceive their parenting ability as poor. Furthermore, they found that maternal self-efficacy was positively correlated with perceptions of infant difficulty. This suggests that when a mother experiences high levels of depression and perceives her infant as difficult she also feels less efficient. Church, Brechman-Toussaint and Hine (2005) found similar results in a study that investigated if dysfunctional cognitions mediated the relationship between risk factors and post-natal depression. Despite a relatively small sample size for path analysis they found that mothers with a difficult baby were more likely to experience maternal-specific dysfunctional cognitions. Such that mothers who perceive their babies as difficult are more likely to make negative appraisals and judgments about themselves as mothers and as a result experience higher levels of depressive symptomology.

Milgrom and Beatrice (2003) investigated cognitive and defence styles of post-natal women (depressed and non-depressed) by undertaking psychometric measures and structured

interviews at three and 24 months post birth. They found that even when controlling for depression symptoms more irrational cognitions, a less mature defence style and less feelings of control were experienced by depressed mothers. However, they found that trait-cognitive styles existed for depressed mothers following recovery from PND. Therefore, women who experience PND may possess a cognitive style which may render them vulnerable to rumination and, as a result, unable to fully attend to their environment and all the available information for parental problem-solving. Participants within the PND group were, however, patients at psychiatric in-patient mother and baby units and data concerning past history of depressive episodes was not reported. As a result, it may be argued that this population represents mothers with the most chronic depressive symptoms. Furthermore, when using structured interviews and self report measures participants may have opted for more extreme responses which may not have been reported in less rigid data collection methods, qualitative research may provide alternative insight into cognitive styles in PND. Despite these criticisms further evidence comes from Jones et al., (2010) who found that mothers with a history of PND showed depressogenic characteristics associated with low self-esteem, higher dysfunctional attitudes and neuroticism as compared to a control group.

If a woman has negative experiences of parenting due to the presence or possible interaction between a perceived difficult baby, reduced confidence and dysfunctional cognitions, it may render them susceptible to a ruminative cycle of negative thinking and consequently lower mood. Research indicates that depressed mothers are more hostile, irritable, less engaged and exhibit less warmth and emotion towards their infants (Lovejoy, Graczyk, O'Hare & Neuman, 2000; Field, 2010). In turn, it has been found that infants of depressed mothers are less responsive than those of non-depressed mothers (Hernandez-Reif, Field, Diego, Vera & Pickens, 2006; Field, Diego & Hernandez-Reif, 2009). Teti and Gelfand (1997) considered the cognitive aspects of depression on a mother's availability for

their infant in that depression may narrow their attentional field and as a result undermine problem-solving abilities, predisposing the individual to parenting deficits. Further support for this concept comes from reports of depressed parents as being characterised as ruminative, self-absorbed and preoccupied (Gelfand & Teti, 1990).

Research concerning the application of a stress coping model to antenatal depression highlighted a link between the avoidant emotion coping strategy of 'wishful thinking' and higher depression levels in antenatal women. Furthermore, the same study highlighted greater threat appraisal and lower self-efficacy as being correlated with greater depressive symptoms in antenatal women. Data was however, cross-sectional in design and thus does not provide insight into the direction of the relationships between these predictors and antenatal depression (Pakenham, Smith & Rattan, 2007). Wishful thinking, however, could be considered linked to ruminative thinking.

Research into possible cognitive processes in antenatal and post-natal depression highlight that depression at this time may lead to increased cognitive load. Stein, Lentone, Harvey, Nicol-Harper and Craske (2009) note this may result in a reduced responsiveness to the environment and child, resulting in a vicious circle of negative thoughts and preoccupation. While little research has focused directly upon the preoccupation or ruminative focus of parents, alternative literature within this population may be drawn upon to illustrate potential consequences. For example, studies have shown that where mothers show reduced sensitivity to their infant (which may occur if their attention is ruminative and self-focused in nature), the infant exhibits more signs of distress and more avoidant contact (Field, 1995). Poorer emotional, social and cognitive development for children has also been associated with PND (Murray, Kempton, Wollgar & Hooper, 1993; Hay et al., 2003). For example, Pawlby, Sharp, Hay and Keane (2008) found that 11-year-old children of PND mothers were four times more likely to experience a psychiatric disorder themselves.

Furthermore, poorer parenting practice as characterised by not attending regular well-child clinic visits, not keeping up with vaccination updates and use of safety devices, such as plug socket covers, have also been associated with PND (McLearn, Minkovitz, Strobion, Marks & Hou, 2006a, 2006b; Zajicek-Farber, 2009). Rumination in the presence of PND may therefore not only hold consequences for the infant but also for the mothers availability to engage in parenting tasks, this may in turn hold consequences for parental problem-solving.

### **Parental Problem-Solving**

The parenting and rumination literature together suggest that preoccupation or rumination in PND may have implications for a parents availability to attend to external information and solve problems. Elliott, Shewchuck, Richeson, Pickelman & Weaver-Franklin (1996) undertook a study into problem-solving appraisal and the prediction of post-natal depression. One hundred women were interviewed at eight months gestation and four weeks postpartum about their problem-solving ability and trait affectivity. Results indicated that lower problem-solving confidence was directly related to lower affect and indirectly to an increase in depression levels among antenatal women. Furthermore, these participants' self-appraised skills in regulating their emotional and behavioural reactions in problem-solving situations were related to lower negative affect and indirectly with PND.

The literature suggests that parental problem-solving may thus be at risk if mothers are depressed, lack confidence and self-efficacy, hold dysfunctional cognitions and are susceptible to preoccupation/rumination. Literature surrounding depressed mothers highlights that they are less attentive towards their babies and that this has adverse developmental outcomes for the child. If rumination in depressed post-natal mothers fosters a cognitive inflexibility in attending to and problem-solving in the first year of an infant's life it may

have implications for the mother in a ruminative cycle of thinking and low mood and longer term consequences for infant development.

Research has shown that treating PND results in better outcomes for both mother and child (Cooper & Murray, 1997; Nysten, Moran, Franklin & O'Hara, 2006; Poobalan, Aucott, Ross, Smith & Helms, 2007) and, as a result, research into the effects of rumination on mood, confidence and problem-solving within the post-natal period would aim to provide insight into potential interventions for post-natal depression and increase outcomes for both mother and child.

## **Conclusion**

Research shows that rumination and depressed or dysphoric mood affects problem-solving and holds additional adverse consequences such as reducing mood, confidence and increasing cognitive load. Problem-solving research has further found distraction assists mood and aids problem-solving. Cognitive processes in peri/post-natal depression highlight that low self-efficacy and confidence, dysfunctional cognitions and a less mature defence style may render a mother susceptible to depression. However, a gap appears to exist in the literature drawing the two strands of research together. As the literature highlights, rumination in post-natally depressed mothers may result in a number of adverse consequences and reduce the mother's availability for, and ability to, care for their infant (Stein et al., 2009). If distraction alleviates some of these difficulties, lifts moods and aids successful problem-solving this may hold potential implications for interventions in the perinatal period for women with depressive symptoms. Outcome research illustrates the benefits of treating PND and increased parental problem-solving confidence may correlate with greater efficacy and affect (Teti & Gelfand, 1991; Elliott et al., 1996; Poobalan et al., 2007). Therefore a greater understanding of the interplay of rumination and distraction upon

parental confidence, mood and problem-solving in depressed mothers may hold beneficial theoretical and clinical implications.

## References

- Abela, J. R. Z., Brozina, K., & Haigh, E. P. (2002). An examination of the response styles theory of depression in third and seventh-grade children: A short-term longitudinal study. *Journal of Abnormal Child Psychology, 30*, 515-527.
- Beck, A. T., Steer, R. A., & Garbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: twenty-five years of evaluation. *Clinical Psychology Review, 8*, 77-100.
- Butler, L. D., & Nolen-Hoeksema, S. (1994). Gender differences in responses to depressed mood in a college sample. *Sex Roles, 30*, 331-346.
- Church, N. F., Brechman-Toussaint, M. L., & Hine, D. W. (2005). Do dysfunctional cognitions mediate the relationship between risk factors and postnatal depressive symptomology? *Journal of Affective Disorders, 87*, 65-72.
- Cooper, P. J., & Murray, L. (1997). The impact of psychological treatments of post-partum depression on maternal mood & infant development. In L. Murray & P. J. Cooper (Eds.), *Postpartum Depression and Child Development*. New York: Guildford.
- Cornish, A. M., McMahon, C. A., Ungerer, J. A., Barnett, B., Kowalenko, N., & Tennant, C. (2005). Postnatal depression and infant cognitive and motor development in the second postnatal year: The impact of depression chronicity & infant gender. *Infant Behavior & Development, 28*, 405-417.
- Cox, J. L., Murray, D., & Chapman, G. (1993). A controlled study of the onset, duration & prevalence of postnatal depression. *British Journal of Psychiatry, 163*, 27-31.
- Davis, R. N., & Nolen-Hoeksema, S. (2000). Cognitive inflexibility among ruminators and non-ruminators. *Cognitive Therapy & Research, 24*, 699-711.
- Donaldson, C., & Lam, D. (2004). Rumination, mood and social problem-solving in major depression. *Psychological Medicine, 34*, 1309-1318.

- Elliott, T. R., Shewchuk, R., Richeson, C., Pickelman, H., & Farnklin, K. W. (1996). Problem-solving appraisal & the prediction of depression during pregnancy and in the postpartum period. *Journal of Counselling & Development, 74*, 645-651.
- Field, T. (1995). Infants of depressed mothers. *Infant Behavior & Development, 18*, 1-13.
- Field, T. (2010). Postpartum depression effects on early interactions, parenting and safety practices: a review. *Infant Behavior & Development, 33*, 1-6.
- Field, T., Diego, M., & Hernandez-Reif, M. (2009). Depressed mothers' infants are less responsive to faces & voices. *Infant Behavior & Development, 32*, 239-244.
- Gelfand, D. M., & Teti, D. M. (1990). The effects of maternal depression on children. *Clinical Psychology Review, 10*, 329-353.
- Hay, D. F., Pawlby, S., Sharp, D., Asten, P., Mills, A., & Kumar, R. (2001). Intellectual problems shown by 11-year-old children whose mothers had postnatal depression. *Journal of Child Psychology and Psychiatry, 42*, 871-889.
- Hernandez-Reif, M., Field, T., Deigo, M., Vera, Y., & Pickens, J. (2006). Happy faces are habituated more slowly by infants of depressed mothers. *Infant Behavior & Development, 29*, 131-135.
- Hipwell, A. E., Reynolds, S., & Crick, E. P. (2004). Cognitive vulnerability to postnatal depressive symptomology. *Journal of Reproductive and Infant Psychology, 22*, 211-227.
- Jones, L., Scott, J., Cooper, C., Forty, L., Gordon-Smith, K., Sham, P., et al. (2010). Cognitive style, personality and vulnerability to postnatal depression. *British Journal of Psychiatry, 196*, 200-205.
- Jose, P. E., & Brown, I. (2008). When does the gender difference in rumination begin? Gender and age differences in the use of rumination by adolescents. *Journal of Youth & Adolescence, 37*, 180-192.

- Kao, C., Dritschel, B. H., & Astell, A. (2006). The effects of rumination and distraction on over-general autobiographical memory retrieval during social problem solving. *British Journal of Clinical Psychology, 45*, 267-272.
- Kendall, P. C., Hollon, S. D., Beck, A. T., Hammen, C. L., & Ingram, R. (1987). Issues & recommendations regarding use of the Beck Depression Inventory. *Cognitive Therapy & Research, 11*, 289-299.
- Kraaij, V., Pruyboom, E., & Garnefski, N. (2002). Cognitive coping & depressive symptoms in the elderly: A longitudinal study. *Aging & Mental Health, 6*, 275-281.
- Lane, A., Keville, R., Morris, M., Kinsella, A., Turner, M., & Barry, S. (1997). Postnatal depression & elation among mothers & their partners: prevalence & predictors. *British Journal of Psychiatry, 171*, 550-555.
- Lovejoy, M. C., Grayczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression & parenting behavior: a meta-analytic review. *Clinical Psychology Review, 20*, 561-592.
- Lyubomirsky, S., Caldwell, N. D., & Nolen-Hoeksema, S. (1998). Effects of ruminative & distracting responses to depressed mood on retrieval of autobiographical memories. *Journal of Personality & Social Psychology, 75*, 166-177.
- Lyubomirsky, S., Kasri, F., & Zehm, K. (2003). Dysphoric rumination impairs concentration on academic tasks. *Cognitive Therapy & Research, 27*, 309-330.
- Lyubomirsky, S., & Nolen-Hoeksema, S. (1993). Self-perpetuating properties of dysphoric rumination. *Journal of Personality & Social Psychology, 65*, 339-349.
- Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem-solving. *Journal of Personality & Social Psychology, 69*, 176-190.
- Lyubomirsky, S., & Tkach, C. (2004). The consequences of dysphoric rumination. In C. Papageorgiou & A. Wells (Eds.), *Depressive Rumination, Nature, Theory &*

- Treatment*. Chichester: Wiley & Sons.
- Lyubomirsky, S., Tucker, K. L., Caldwell, N. D., & Berg, K. (1999). Why ruminators are poor problem solvers: clues from the phenomenology of dysphoric rumination  
*Journal of Personality & Social Psychology*, *77*, 1041-1060.
- McLearn, K. T., Minkovitz, C. S., Strobino, D. M., Marks, E., & Hou, W. (2006a). Maternal depressive symptoms at 2 to 4 months postpartum and early parenting practices.  
*Archives of Pediatric & Adolescent Medicine*, *106*, 279-284.
- McLearn, K. T., Minkovitz, C. S., Strobino, D. M., Marks, E., & Hou, W. (2006b). The timing of maternal depressive symptoms and mothers' parenting practices with young children: Implications for pediatric practice. *Pediatrics*, *118*(e174-e182).
- McMurrich, S. L., & Johnson, S. L. (2008). Dispositional rumination in individuals with a depression history. *Cognitive Therapy & Research*, *32*, 542-553.
- Milgrom, J., & Beatrice, G. (2003). Coping with the stress of motherhood: cognitive and defence style of women with postnatal depression. *Stress & Health*, *19*, 281-287.
- Murray, L., & Cooper, P. J. (1996). The impact of postpartum depression on child development. *International Review of Psychiatry*, *8*, 55-63.
- Murray, L., & Cooper, P. J. (Eds.). (1997). *Postpartum Depression & Child Development*. New York: Guildford Press.
- Murray, L., Kempton, C., Woolgar, M., & Hooper, R. (1993). Depressed mothers' speech to their infant gender and cognitive development. *Journal of Child Psychology & Psychiatry* *34*, 1083-1101.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, *100*, 569-582.
- Nolen-Hoeksema, S. (2004). The response styles theory. In C. Papageorgiou & A. Wells (Eds.), *Depressive Rumination, Nature, Theory & Treatment*. Chichester: Wiley &

Sons.

- Nolen-Hoeksema, S., Larson, J., & Grayson, C. (1999). Explaining the gender difference in depressive symptoms. *Journal of Personality & Social Psychology, 77*, 1061-1072.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and post-traumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality & Social Psychology, 61*, 115-121.
- Nolen-Hoeksema, S., & Morrow, J. (1993). Effects of rumination and distraction on naturally occurring depressed mood. *Cognition & Emotion, 7*, 561-570.
- Nolen-Hoeksema, S., Parker, L. E., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality & Social Psychology, 67*, 92-104.
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on psychological science, 3*, 400-424.
- Nylen, K. J., Morran, T. E., Franklin, C. L., & O'Hara, M. W. (2006). Maternal depression: a review of relevant treatment approaches for mothers and infants. *Infant Mental Health Journal, 27*, 327-343.
- O'Hara, M. W., & Swain, A. M. (1996). Rates & risk of postpartum depression – a meta analysis. *International Review of Psychiatry 8*, 37-54.
- Pakenham, K. I., Smith, A., & Rattan, S. L. (2007). Application of a stress coping model to antenatal depressive symptomatology. *Psychology Health & Medicine, 12*, 266-277.
- Papageorgiou, C., & Wells, A. (2004). Nature, functions, and beliefs about depressive rumination. In C. Papageorgiou & A. Wells (Eds.), *Depressive Rumination, Nature, Theory & Treatment*. Chichester: Wiley & Sons.
- Pawlby, S., Sharp, D., Hay, D., & O'Keane, V. (2008). Postnatal depression and child outcome at 11 years: The importance of accurate diagnosis. *Journal of Affective Disorders, 107*, 241-245.

- Platt, J. J., & Spivack, G. (1975). *Manual for the Means-Ends Problem-Solving (MEPS) Procedure: a Measure of Interpersonal Cognitive Problem-Solving Skills*. Philadelphia: Hahnemann Community Mental Health/Mental Retardation Centre.
- Poobalan, A. S., Aucott, L. S., Ross, L., Smith, W. C. S., & Helms, P. J. (2007). Effects of treating postnatal depression on mother infant interaction and child development. *British Journal of Psychiatry, 191*, 378-386.
- Radenborg, A. v., Jong-Meyer, R. d., & Huffmeier, J. (2009). Rumination fosters indecision in dysphoria. *Journal of Clinical Psychology, 66*, 1-20.
- Smith, J. M., & Alloy, L. B. (2009). A roadmap to rumination: a review of the definition, assessment, and conceptualization of this multifaceted construct. *Clinical Psychology Review, 29*, 116-128.
- Stein, A., Arteché, A., Lehtonen, A., Craske, M., Harvey, A., Counsell, N., et al. (2010). Interpretation of infant facial expression in the context of maternal postnatal depression. *Infant Behavior and Development, 33*, 273-278.
- Stein, A., Lehtonen, A., Harvey, A. G., & Nicol-Harper, R. (2009). The influence of postnatal psychiatric disorder on child development. *Psychopathology, 42*, 11-21.
- Teti, D. M., & Gelfand, D. M. (1991). Behavioural competence among mothers of infants in the first year: the meditational role of maternal self-efficacy. *Child Development, 62*, 918-929.
- Teti, D. M., & Gelfand, D. M. (1997). Maternal cognitions as mediators of child outcomes in the context of postpartum depression. In L. Murray & P. J. Cooper (Eds.), *Postpartum Depression & Child Development*. New York: Guildford Press.
- Ward, A., Lyubomirsky, S., Sousa, L., & Nolen-Hoeksema, S. (2003). Can't quite commit: rumination & uncertainty. *Personality & Social Psychology Bulletin, 29*, 96-107.
- Watkins, E. (2008). Constructive & unconstructive repetitive thought. *Psychological Bulletin*,

134, 163-206.

Watkins, E., & Baracaia, S. (2002). Rumination and social problem-solving in depression.

*Behaviour Research & Therapy*, 40, 1179-1189.

Wenzlaff, R. M. (2004). Mental control & depressive rumination. In C. Papageorgiou & A.

Wells (Eds.), *Depressive Rumination, Nature, Theory & Treatment*. Chichester: Wiley & Sons.

Zajicek-Farber, M. L. (2009). Postnatal depression and infant health practices among high-risk women. *Journal of Child and Family Studies*, 18, 236-245.



**DEPARTMENT OF PSYCHOLOGY**  
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**Effects of Rumination on Problem-Solving, Mood and Confidence in Post-natal  
Dysphoria**

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# **Effects of Rumination on Problem-Solving, Mood and Confidence in Post-natal Dysphoria**

## **Abstract**

Previous studies have sought to investigate the effects of rumination and distraction on social problem-solving, mood and confidence of dysphoric and depressed individuals. The current study is aimed at extending this literature by examining the effects of rumination on parental problem-solving, mood and problem-solving confidence among dysphoric post-natal women. Fifty-nine post-natal women took part in the study and were allocated to either the dysphoric or control group based upon the Edinburgh Post-natal Depression Scale (Cox, Holden & Sagovsky, 1987). Women were asked to complete measures of mood, confidence and four problem-solving tasks following a rumination or distraction mood induction. Results indicated that dysphoric post-natal women induced to ruminate showed poorer problem-solving and lower mood than dysphoric women induced to distract and non-dysphoric women induced to distract or ruminate. No significant differences were seen in reported confidence levels for dysphoric post-natal women induced to ruminate than dysphoric women induced to distract and non-dysphoric women induced to distract or ruminate. Consideration is given to the clinical implications of these findings as well as the limitations and possibilities for future research.

*Keywords:* Rumination; Distraction; Post-natal; Problem-solving; Confidence; Mood.

## **Introduction**

### **Background**

It is estimated that post-natal depression (PND) affects between 10-15% of women (Cox, Murray & Chapman, 1993; Lane et al., 1997) and has been associated with adverse effects for both the mother and child (Gelfand & Teti, 1990; Murray & Cooper, 1996; Cornish et al., 2005). There is a paucity of research investigating the specific mechanisms that impact and influence PND and the mother-infant relationship. This area of investigation is of importance as research has highlighted that maternal psychopathology affects not only the mother-infant relationship, but holds subsequent negative long-term outcomes for the emotional, social and cognitive development for children (Murray et al., 1999; Hay et al., 2001; Cornish et al., 2005; Pawlby, Sharp, Hay & Keane, 2008; Murray et al., 2010). For example, Pawlby et al., (2008) found that at 11 years of age, children of PND mothers were four times more likely to experience a psychiatric disorder themselves and Hay et al., (2001) demonstrated poorer cognitive and intellectual functioning at 11 years in children whose mothers had experienced PND. The long-term negative effects of PND remain even after treatment and little is known about specific mechanisms that contribute to the mother-infant relationship. As a result, other factors may be involved than just depression per se. The specific mechanisms that may contribute to PND, such as rumination, may also hold consequences for a mother's ability to engage fully with the task of parenting and problem-solving.

Much depression-focused research has investigated the link between depression and rumination and the existence of ruminative thinking within depressed individuals (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008; Smith & Alloy, 2009). However, little is known specifically about the role of rumination in PND and whether it may impact specifically on

parenting. Nolen-Hoeksema (1991) defines rumination as “behaviours and thoughts that focus one’s attention on one’s depressive symptoms and on the implications of these symptoms” (p569). Rumination involves repetitively and passively focusing upon one’s symptoms of distress and the meaning associated with those symptoms, without any focus on possible action to alleviate them (Nolen-Hoeksema, 2004; Nolen-Hoeksema et al., 2008). Nolen-Hoeksema (1991) proposed a response styles theory that suggests ruminative thinking maintains and intensifies depression by increasing negative thinking, impairing effective problem-solving and interfering with instrumental behaviour<sup>1</sup>. Furthermore, as higher rumination levels are reported by women, it has been proposed that rumination may mediate the gender gap in depression<sup>2</sup> (Nolen-Hoeksema, 1990; 1994; 2002; Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema, Larson & Grayson, 1999; Jose & Brown, 2008).

When considering the impact of rumination in post-natal depression on parenting, it is important to consider the possible implications for the bond between mother and child. Research shows that infants of PND mothers are less likely to show a secure attachment and are marginally more likely to show an avoidant and disorganised attachment style (Martins & Gaffan, 2000). The way a depressed mother interacts with her infant has been attributed to a mother’s preoccupation (Stein, Lehtonen, Harvey, & Nicol-Harper, 2009) which has in turn been linked to the construct of rumination (Papageorgiou & Wells, 2004). Both constructs involve the absorption of personal thoughts, which focus an individual’s attention inward, potentially narrowing their overall attention. This in turn may lead to a reduced responsiveness to their environment. This may hold a variety of implications for the post-natal period. For example, Stein, et al., (2009) propose that repetitive thoughts associated with PND, not only interfere with mental functioning, attendance and responsiveness to the

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<sup>1</sup> See Appendix A, Extended Introduction for more details regarding the response styles theory.

<sup>2</sup> See Appendix A, Extended Introduction for more details about gender differences in rumination.

environment, but further impede parenting capacities. This in turn, not only affects mother-infant interaction, but holds subsequent negative implications for child development. For example, research highlights that depressed mothers spend less time looking, touching, engaging and playing with their infants and longer term negative child outcomes have been attributed to such mother-infant interactions (Field 2010). Furthermore, research highlights that PND mothers are less likely to engage in safety practices such as using an infant car seat, or having electric socket covers, as well as attend well-child clinics and ensure their infants have up-to-date vaccinations (McLearn, Minkovitz, Stobion, Marks & Hou, 2006a, 2006b; Zajicek-Farber, 2009). Therefore, research reporting on the adverse consequences of parenting in the presence of PND, may be related to a mother's preoccupation or ruminative focus leading, to less availability to engage in desirable parenting practice.

### **Consequences of rumination**

In line with the response styles theory, experimental studies have shown that dysphoric individuals who are induced to ruminate experience an increase in depressive symptoms, lower mood and prolonged periods of distress (Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema & Morrow, 1993; Nolen-Hoeksema, Parker & Larson, 1994; Lyubomirsky & Nolen-Hoeksema, 1995; Donaldson & Lam, 2004). Research has also shown that self-focused rumination leads to reduced motivation, negative self-criticism and self-blame for problems, reduced self-confidence, lowered optimism, increased indecision, increased negative thinking, decreased feelings of control and reduced concentration (Lyubomirsky & Nolen-Hoeksema, 1993; Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky, Tucker, Caldwell, & Berg, 1999; Lyubomirsky, Kasri, & Zehm, 2003; Ward, Lyubomirsky, Sousa & Nolen-Hoeksema, 2003; van Radenborgh, de Jong Meyer & Huffmeier, 2009). Furthermore, it has been suggested that ruminators pay more attention to

their negative thoughts, which may interfere with everyday functioning due to their absorbing, compelling and self-perpetuating nature. This may have wide reaching consequences, such as not paying attention to others, leading to greater friction in relationships (Lyubomirsky & Tkach, 2004). These consequences of rumination suggest that a mother may find it difficult to attend fully to external information, which may hold implications for parenting and parental problem-solving.

### **Rumination and Problem-solving**

Problem-solving requires an individual to attend to information presented and develop a step-by-step plan to generate a desirable outcome (Platt & Spivack, 1975). This may be considered of even greater importance when it involves an infant who is unable to care for him or herself. Much literature has investigated the effects of rumination on problem-solving, however, this had not been directly related to PND. For example, Lyubomirsky and Nolen-Hoeksema (1995) used a modified version of the Means Ends Problem-Solving task (MEPS; Platt & Spivack, 1975) to investigate the effects of rumination and distraction on problem-solving in dysphoric and non-dysphoric students. Results indicated that the dysphoric ruminative group showed poorer problem-solving ability than the dysphoric distracters group, the non-dysphoric ruminator and distractor groups. The dysphoric distraction group's responses were equal to both the non-dysphoric ruminators and distracters, indicating that rumination in the presence of dysphoria affects problem-solving.

The negative effects of rumination on problem-solving have also been seen in clinical populations<sup>3</sup> (Watkins & Baracaia, 2002; Donaldson & Lam, 2004). In contrast to rumination, distraction has been found to aid problem-solving and increase mood in

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<sup>3</sup> See Appendix A, Extended Introduction for greater details of research with a clinical population.

dysphoric and depressed participants. (Nolen-Hoeksema & Morrow, 1993; Donaldson & Lam, 2004).

### **Cognitive Processes in the Perinatal and Post-natal Period.**

The rumination literature has highlighted some of the consequences of rumination as: reduced confidence, lowered self-efficacy, increased self-criticism and increased self-blame. Research within the perinatal period has shown that mothers are more likely to experience PND when they lack confidence in their own ability. For example, Hipwell, Reynolds and Crick (2004) investigated the possibility of a cognitive vulnerability to post-natal depressive symptomatology and found that a tendency to self-devalue predicted depressed mood at eight weeks postpartum (after controlling for depression antenatally). Jones et al., (2010) further investigated cognitive style, personality and a vulnerability to PND and their findings suggested that women who had a history PND showed depressogenic characteristics associated with low self-esteem, higher dysfunctional attitudes and neuroticism as compared to a control group. Teti & Gelfand, (1991) found a correlation between maternal depression and parental self-efficacy, indicating that depressed mothers are more likely to perceive their parenting ability as poor. Furthermore, Milgrom and Beatrice (2003) investigated cognitive and defence styles of post-natal women and found that, even when controlling for symptoms of depression, depressed mothers experienced more irrational cognitions, a less mature defence style and less feelings of control.

Therefore, the presence or possible interaction of reduced confidence and dysfunctional cognitions, may render a mother susceptible to a ruminative cycle of negative thinking and consequently lower mood. Research indicates that depressed mothers are more likely to perceive their infants' facial gestures as negative, be more hostile, irritable, less engaged and exhibit less warmth and emotion towards their infants than non-depressed

mothers (Lovejoy, Graczyk, O'Hare & Neuman, 2000; Field, 2010; Stein et al., 2010). In turn it has been found that infants of depressed mothers are less responsive than infants of non-depressed mothers (Hernandez-Reif, Field, Diego, Vera & Pickens, 2006; Field, Diego & Hernandez-Reif, 2009). Therefore, when considering the cognitive aspects of depression on a mother's availability for their infant, depression may narrow a mother's attentional field which, in turn, may reduce their responsiveness to the environment and, subsequently, to their child. This potential narrowing may, in turn, undermine their problem-solving ability, potentially predisposing them to parenting deficits (Teti & Gelfand, 1997; Stein et al., 2009). For example, studies have shown that where mothers show reduced sensitivity to their infant (which may occur if their attention is ruminative and self-focused in nature), the infant exhibits more signs of distress and more avoidant contact (Field, 1995). Furthermore, depressed parents have been characterised as ruminative, self-absorbed and preoccupied (Gelfand & Teti, 1990). This self-preoccupation or dwelling upon the difficult aspects of mothering may therefore, have implications for parental problem-solving. Elliott, Shewchuck, Richeson, Pickelman & Weaver-Franklin (1996) found that lower problem-solving confidence was directly related to lower affect and, indirectly, to an increase in depression levels in antenatal women.

The literature highlights that rumination may affect parental problem-solving in dysphoric mothers. This may be due to heightening the information processing biases present in depression (such as attending to negative view points and discounting achievement [Wenzlaff, 2004]) and by increasing preoccupation with internal thoughts and processes, which may interfere with information from their baby. As a result, dysphoric ruminating mothers may have less information on which to base their problem-solving (which may be evident from the literature surrounding PND and infant cues). Furthermore, it is important to

consider problem-solving in PND specifically because there is potentially less ambiguity about responsibility between mother and baby than between two adults. Therefore, parental problem-solving could be considered unique in its composition as it may be considered of greater importance to understand and act upon as a result of the dependant nature of a developing infant and a mother's need to provide care. If distraction alleviates some of these difficulties, lifts moods and aids successful problem-solving this may hold potential implications for interventions in the post-natal period for women with depressive symptomology.

### **Hypotheses**

This research aims to address the gap in the literature focusing on rumination, mood, problem-solving and confidence in the post-natal period. It was hypothesised that dysphoric post-natal women induced to ruminate would show lower mood, poorer problem-solving skills and reduced parental problem-solving confidence compared to dysphoric post-natal women induced to distract and a control group (non-dysphoric post-natal women) induced to ruminate or distract.

## **Method**

### **Participants**

This study involved 59 post-natal women<sup>4</sup>, which was determined by a power calculation which indicated that for 80 per cent power, with a medium effect size of 0.52, s.d (1.47), alpha of 0.05, 63 participants were needed. All participants were mothers with a baby aged 12 months and under, who were still caring for the infant. Women were excluded if English was not their first language or if they were suffering from psychosis. Three women agreed to take part but withdrew before meeting with the researcher. Women were primarily recruited via health visitor contact lists, perinatal mental health specialists, informal baby networks (e.g. baby groups and nurseries), internet advertising and via GP record searches. Twenty women were experiencing low mood/dysphoria and considered most likely to be suffering from a depressive illness as assessed by scoring 13 or more on the Edinburgh Post-natal Depression Scale (EPDS, Cox, Holden & Sagovsky, 1987). Thirty-nine women scoring 12 or less on the EPDS were allocated to the control group. Demographic information for the women who took part in the study can be seen in Table 1.

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<sup>4</sup> See Appendix B, Extended Method for an outline of recruitment procedures.

Table 1.

Demographic information of participants by group.

	Participants N= 59
Mothers age in years mean (SD)	32 (4.28)
Baby age in months mean (SD)	5 (3.76)
EPDS mean (SD)	9.39 (5.53)
BDI-II mean (SD)	13 (9.20)
Yearly household income mean (SD)	£49,957.63 (32,990.89)
Average number of hours sleep per night in the last week mean (SD)	5.97 (1.25)
<b>Marital Status:</b>	
Married	45 (76.3%)
Single	3 (5.1%)
Co-habiting	11 (18.6%)
<b>Education Level:</b>	
GCSEs	3 (5.1%)
Further Education Qualifications/A' Levels	10 (16.9%)
University Diploma	3 (5.1%)
University degree	22 (37.3%)
Post-graduate degree	21(35.6%)
<b>Number of children in the household:</b>	
1 child	40 (67.8%)
2 children	11 (18.6%)
3 children	7 (11.9%)
4 children	1 (1.7%)
<b>Ethnicity:</b>	
White British	54 (91.5%)
White Irish	1 (1.7%)
White other background	2 (3.4%)
Mixed White & Asian	1 (3.4%)
Other mixed background	1 (3.4%)

## Design

This research replicates and extends a study by Lyubomirsky and Nolen-Hoeksema (1995) which examined the effects of induced rumination and distraction on interpersonal problem-solving in dysphoric and non-dysphoric students. A 2x2 between groups experimental design was used; dysphoric/control group verses rumination/distraction conditions. Table 2 displays the allocation of participants to group. The independent variables were dysphoria status and

induced rumination or distraction; the dependant variables were mood, problem-solving ability and confidence. Women within the two groups (dysphoric and control group) were randomly allocated to either a distraction or rumination condition.

Table 2. The 2x2 design participant numbers by group and mood induction.

		Participant Group	
		Dysphoric Group	Control Group
Mood Induction Condition	Distraction Induction	N = 10	N = 20
	Rumination Induction	N = 10	N = 19

### Procedure<sup>5</sup>

Ethical approval was granted from the South West II Research and Ethics Committee and the Research and Development Committee for NHS Devon, Devon Partnership Trust and the Royal Devon and Exeter Hospital Trust<sup>6</sup>. Women were recruited via health visitors, perinatal mental health specialists, informal baby networks (e.g. baby groups and nurseries), internet advertising and via letter following GP record searches for women diagnosed with PND.

Women were given information about the study and asked to contact the researcher directly if they were interested in taking part (either via telephone, email or reply consent to contact form). Participants were then contacted by telephone or email (according to their preference) and provided with further information about the study and asked to complete the EPDS (Cox, at al., 1987) to establish their probable depression status. An appointment was then arranged to meet with the researcher to undertake the experiment (all meetings took place within two

<sup>5</sup> See Appendix B, Extended Method for participant information sheets and consent forms.

<sup>6</sup> See Appendix B, Extended Method for letters of Ethical approval.

weeks of initial contact). All experiments were run individually at the mothers' homes ( $N = 55$ , 93.1%), mothers' workplaces ( $N = 3$ , 5.1%) or the University of Exeter ( $N = 1$ , 1.7%). Women were asked to complete two consent forms (one for the author and one for their information) followed by the BDI-II (Beck, Steer & Brown, 1996) to assess their depression symptom severity. Demographic information was collected before women were randomly allocated to either a distraction or rumination condition via sequentially numbered opaque sealed envelopes. Prior to commencing the rumination or distraction induction and subsequent problem-solving tasks, a visual analogue scale (VAS-M) was used to establish baseline mood.

For the induction, women were asked to read through the list of statements and to spend exactly eight minutes focusing upon the task. Women then completed a mood check (VAS-M) to assess if the induction was successful. This was followed by two problem-solving scenarios (where no time limit was given). Mood (VAS-M) and confidence (VAS-C) were then assessed. To ensure the rumination or distraction induction was maintained across all problem scenarios it was repeated for a further eight minutes. Women were then again asked to complete a mood check (VAS-M) to assess the manipulation, followed by two further problem-solving scenarios. Mood (VAS-M) and confidence (VAS-C) ratings were then repeated. Women were then debriefed and a positive mood music induction followed; Mazurka from the ballet "Coppelia" by Delibes, recorded at normal speed, was presented for seven minutes (as used in previous research; Clark & Teasdale, 1985; Yeung, Dalgleish, Golden & Schartau, 2006). Mood was then reassessed (VAS-M) to ensure the participants mood had returned to baseline. All participants mood returned to baseline following the positive mood induction.

## Materials<sup>7</sup>

**The Edinburgh Post-natal Depression Scale (EDPS, Cox et al., 1987)** is a ten-question self-report scale specifically designed to screen for post-natal depression. Women are asked to place their answers within four given responses which are scored from 0-3. Scores of 13 and above were used to indicate ‘probable depression status’ and subsequent allocation to the dysphoric group (Cox et al., 1987; Cox & Holden, 2003). The questionnaire has a sensitivity of 86%, specificity of 78% and positive predictive value of 73% (Cox et al., 1987). The EPDS is the most widely validated questionnaire used to identify women with PND (Hewitt, Gilbody, Mann & Brealey, 2010).

**The Beck Depression Inventory-II (BDI-II, Beck et al., 1996)** is a 21-question self-report questionnaire designed as a measure of depression symptomology, in which items are scored from 0-3. The BDI-II was used to assess current mood state and depression severity; on average women within the dysphoric group reported moderate levels of depression ( $M = 22.4$ ,  $SD = 9$ ) and women within the control group reported minimal levels ( $M = 8.2$ ,  $SD = 4.3$ ). The BDI-II (with a cut off score of 14) has a sensitivity of 57%, specificity of 97% positive predictive value of 90% when used to assess for PND (Tatano-Beck & Gable, 2001).

**Mood measure: A visual analogue scale (VAS-M)** ranging from 0 (low mood) to 100 (high mood) was used to assess current mood level throughout the experiment (as used in previous research e.g. Nolen-Hoeksema & Morrow, 1993).

**Confidence measure: A visual analogue scale (VAS-C)** ranging from 0 (low confidence) to 100 (high confidence) was used to assess current level of parental problem-solving confidence (as used in previous research e.g. Lyubomirsky et al., 1999)

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<sup>7</sup> See Appendix B, Extended Method for copies of all measures used within the study.

**Rumination and Distraction Mood Induction.** The induction task used was developed by Nolen-Hoeksema & Morrow (1993) and adapted by Watkins & Baracaia (2008) for a UK population. It was designed to influence the women's thoughts by requiring them to think about and focus their attention on a number of statements was used to induce either a rumination or distraction state. The rumination condition asked women to focus upon a number of statements that were designed to promote thoughts related to emotions, behaviours and the self, for example, "think about the physical sensations you feel in your body", "think about what your feelings might mean", "how happy or sad you are feeling". For the distraction condition, statements designed to focus thoughts and attention externally, not related to emotions, behaviours or themselves were used. For example, women were asked to "think about the shape of a large black umbrella", "think about a double-decker bus driving down a street"<sup>8</sup>.

**Parental Problem-Solving Task (PPST)**<sup>9</sup>. The measure of parental problem-solving was developed by two authors for use in this study. It was developed in line with the Means Ends Problem-Solving task (MEPS, Platt & Spivack, 1975) which was designed to assess interpersonal problem-solving. Parental problem-solving may be considered distinctly different to interpersonal problem-solving as the care-giver is responsible for a dependant infant. Interpersonal problem-solving involves situations and interactions with other people, where some degree of responsibility may be attributed to others, whereas, we consider parental problem-solving to attribute responsibility to the mother who has to manage to needs of an infant. This cannot be avoided due to possible detrimental consequences for infant care and safety.

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<sup>8</sup> See Appendix B, Extended Method for a complete list of induction statements.

<sup>9</sup> See Appendix B, Extended Method for more details on the PPST and a scoring manual.

To assess parental problem-solving, consultation with mothers was undertaken to develop four parental problem-solving scenarios. Initially, consultation was undertaken with five mothers to develop problem areas and difficulties associated with parenting a child under 12 months of age.

Following this, four problems were drawn together and reviewed by the five mothers who provided the initial consultation. In order to assess the range of possible answers the four questions were then piloted on four other mothers. Following this pilot, a basic framework was developed to score the answers. Further consultation was then undertaken with three psychologists who were also mothers, to provide feedback on the areas considered. These areas were then refined based on feedback and consideration of the literature pertaining to post-natal depression, the original MEPS scoring and the modified scoring used by Lyubomirsky and Nolen-Hoeksema (1995).

The scoring criteria for the PPST included: whether a solution was given, whether obstacles were noted, whether mothers attended to their own and their baby's emotional state and whether positive attributions were made about themselves, their baby and others as well as an overall effectiveness rating<sup>10</sup>. The scoring was akin to the original MEPS task, in that the MEPS scored for 'means', the enumeration of 'means' and obstacles. The PPST scored for solutions and steps to achieving the end of the story by way of additional solutions and was based upon the notion of 'means'. The PPST scored for obstacles in the same way as the MEPS. Participants thus received a point for each solution and obstacle noted. The PPST differed by way of scoring for attributions, and if a mother attended to the emotional needs of herself and baby. Participants received one point for attendance to their emotional need and their baby's and one point for each attribution made no matter how many were noted in each

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<sup>10</sup> See Appendix B, Extended Method for the PPST scoring manual.

answer. Finally in order to further assess the overall quality of the problem-solving answer participants also received an additional overall effectiveness rating which was based upon the measure of developed by Lyubomirsky and Nolen-Hoeksema (1995). Participant's final score of parental problem-solving was thus based upon all these factors. In order to develop equality of scoring, the two authors rated and re-rated pilot answers to ensure scoring instructions resulted in consistent agreement of scores.

The four problems reflected a variety of situations and the complexity of caring for a child (for example, one problem related to concern for their baby's health and another related to a complex situation where the mother had forgotten their wallet and spare nappies and was in a new town). Women were presented with the beginning and end of the story for each problem and, consistent with the original MEPS task, were asked to write a narrative connecting the beginning of the story which was given to them with the end of the story given to them, i.e. to provide a middle for each story. They were asked to imagine they were experiencing the problem themselves and describe what they would do in the given situation. Problem scenarios were presented in the first person and were counter balanced by way of a Latin matrix, across all participants to avoid any possible order effects<sup>11</sup>. All problem scenarios were scored in the first instance by the author. To ensure equality of scores, an independent scorer unaware of the dysphoria or manipulation status of women rated a random ten per cent of answers. An inter-rater reliability analysis using the Kappa statistic was performed to determine consistency among scorers. Results indicted a substantial level of agreement between raters, Kappa = 0.79 (p <0.001)<sup>12</sup>.

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<sup>11</sup> See Appendix B, Extended Method for information about counter balancing.

<sup>12</sup> See Appendix B, Extended Method for information on the Kappa statistic.

## Results

### Assumptions of Normality

The group sizes between the dysphoric ( $N = 20$ ) and control group ( $N = 39$ ) were different. Although purposively oversampling was employed, the differences in these groups represent the naturally occurring rates of depression in the general post-natal population (9.8%; Bennett, Einarson, Taddio, Koren & Einarson, 2004). Although the different sample sizes may constitute a violation of the assumptions underlying parametric analysis, in our sample we had greater variability in participant responses in the control group. This increase in variability has the effect of moderating significance values, leading to a more conservative test of the hypotheses (Boneau, 1960). Based upon this, it was considered safe to trust the significance levels obtained through parametric analysis, where data met the other assumptions of normality (e.g. kurtosis, skew, P-Plots and the Kolmogorov-Smirnov test).

Prior to analysis, tests of normal distribution were carried out. Problem-solving and confidence met parametric assumptions. Mood, however, violated the assumptions of normality. Non-parametric tests were therefore undertaken with mood.

Prior to the main analyses, Chi-square and t-tests were carried out to assess if any differences were present between demographic variables and experimental condition that could have influenced the main analyses. No significant differences were found.<sup>13</sup>

### Data Analysis Strategy

In order to assess the predicted hypotheses that dysphoric ruminators would show poorer problem-solving than the dysphoric distracters, control distracters and control ruminators, planned contrasts were run (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky et al., 1999). The same strategy was employed to assess the predicted

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<sup>13</sup> Please see Appendix C, Extended Results for further details.

hypothesis that dysphoric ruminators would report lower problem-solving confidence than dysphoric distracters, control distracters and control ruminators. Post-hoc tests were then undertaken to investigate any effects of distraction between the dysphoric distracters and control group. Measures of mood were assessed by Mann-Whitney U tests, with effect size ( $r$ ) reported.

### **Baseline mood**

Prior to the experiment a visual analogue scale for mood (VAS-M) was used to measure baseline mood. As expected, results indicated that women within the dysphoric group reported significantly lower mood/greater dysphoria ( $Mdn = 59.50$ ) than women in the control group ( $Mdn = 72.22$ ),  $U=175.00$ ,  $z= -3.44$ ,  $p<0.01$ ,  $r=0.45$ .

### **Mood manipulation check**

In order to assess the induction, two separate Mann-Whitey U analyses were undertaken for each group. Following the induction dysphoric women in the rumination condition group reported lower mood ( $Mdn = 144.75$ ) than the distraction group ( $Mdn = 123.00$ ). However, these results did not differ significantly,  $U=45$ ,  $z=-0.37$ ,  $p=0.71$ ,  $r=-0.09$ . Following the induction, for the control group, the reported mood of the women in the rumination condition ( $Mdn = 150.00$ ) did not significantly differ from the distraction condition group ( $Mdn = 149.50$ ),  $U=177.00$ ,  $z=-0.37$ ,  $p=0.72$ ,  $r=-0.06$ .

### **Problem-solving effectiveness**

Mean results for problem-solving effectiveness by group can be seen in Figure 1. As predicted, the dysphoric ruminative group demonstrated the poorest mean problem-solving effectiveness ( $M = 32.80$ ,  $SD = 13.01$ ), compared with the other three groups ( $M = 40.44$ ,  $SD = 13.15$ ),  $F(1,55)=6.62$ ,  $p=0.03$ , supporting the predicted hypothesis. Post-hoc pairwise

comparisons indicated that the dysphoric distraction group did not significantly differ from the control distraction group,  $F(3,55)=2.97$ ,  $p=1.00$ , or from the control ruminative group  $F(3,55)=2.97$ ,  $p=1.00$ .

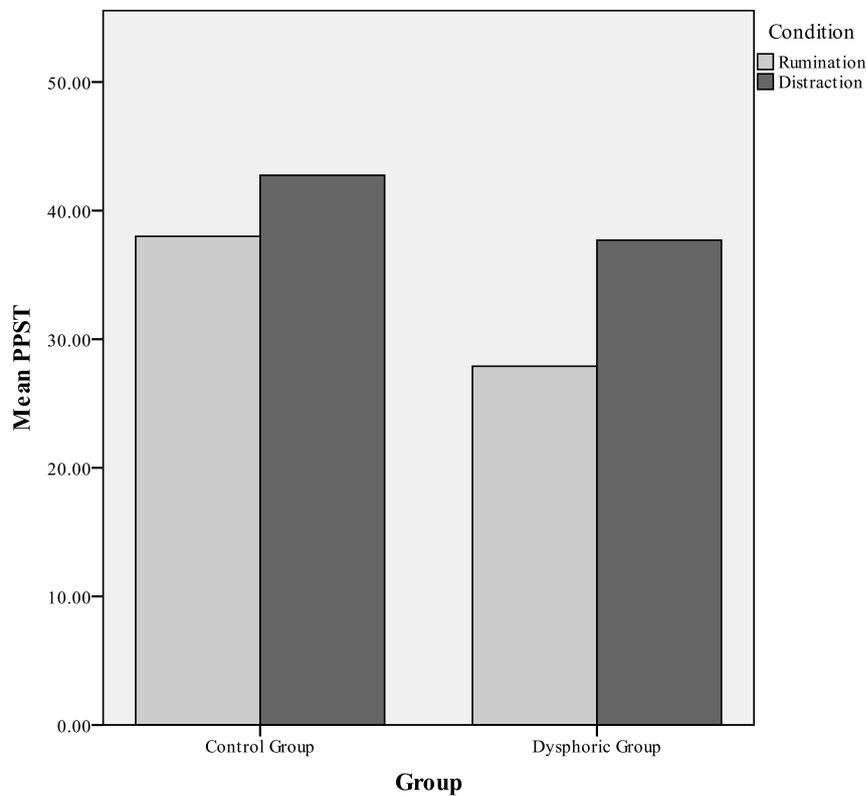


Figure 1: Graph displaying the mean scores for effectiveness for problem-solving by group.

### Parental Problem-solving Confidence

Mean results for parental problem-solving confidence by group can be seen in Figure 2. The results of the planned contrast did not support the prediction that dysphoric ruminators would report lower parental problem-solving confidence ( $M = 126.13$ ,  $SD = 32.57$ ), than the other three groups ( $M = 151.38$ ,  $SD = 19.37$ ),  $F(1,55)=2.12$ ,  $p=0.15$ . Post-hoc pairwise comparisons indicated that dysphoric distracters ( $M = 123.00$ ,  $SD = 35.57$ ) significantly

differed from the control distraction group ( $M = 154.85, SD = 19.38$ ),  $F(3,55)=4.96, p=0.01$ , but did not differ significantly from the control rumination group ( $M = 147.74, SD = 19.18$ ),  $F(3,55)=4.96, p=0.08$ .

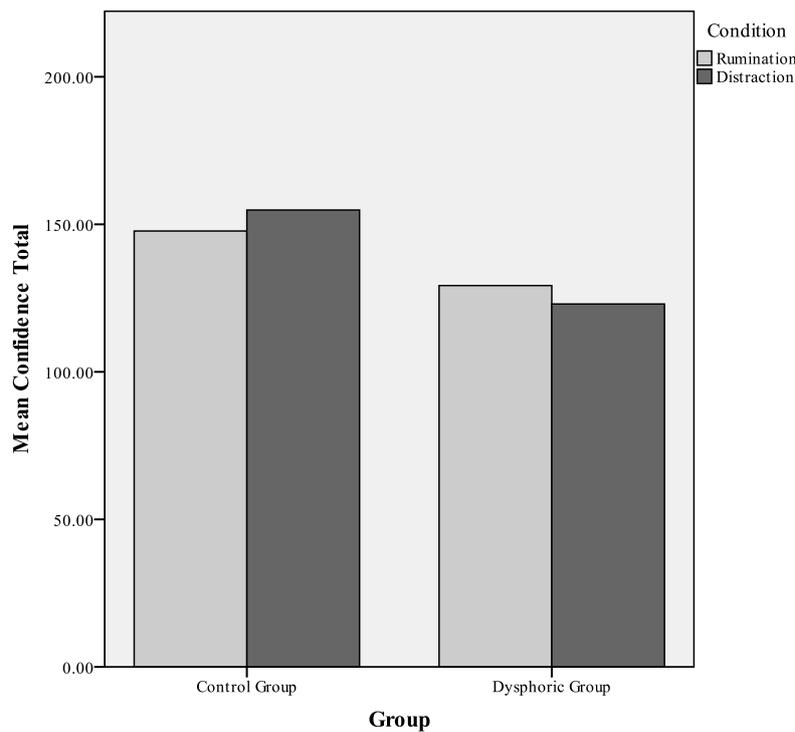


Figure 2: Graph displaying the mean scores for parental problem-solving confidence.

## Mood<sup>14</sup>

Median results for mood by group can be seen in Figure 3. Results indicated that dysphoric ruminators ( $Mdn = 232.50$ ) reported significantly lower mood than the other three groups ( $Mdn = 298.00$ ),  $U = 167.5, z = -3.56, p < 0.01, r = -0.46$  supporting the predicted hypothesis. Further Mann Whitney U tests were run to assess the effects of distraction. Dysphoric distracters mood ( $Mdn = 253.50$ ) significantly differed from the control

<sup>14</sup> See Appendix C for parametric equivalents

distraction group ( $Mdn = 298.50$ )  $U = 53$ ,  $z = -2.07$ ,  $p = 0.03$ ,  $r = -0.38$ , but did not significantly differ from the control rumination group ( $M = 298$ ),  $U = 57.50$ ,  $z = -1.72$ ,  $p = 0.09$ ,  $r = -0.32$ .

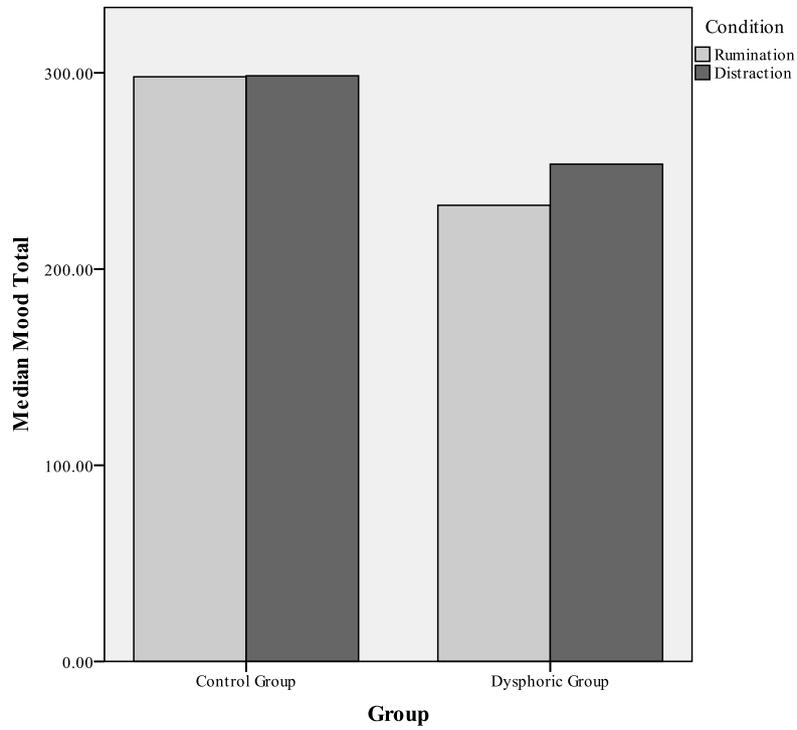


Figure 3: Graph displaying the median scores for mood.

## Discussion

The results of the current study partly support the predicted hypotheses. Overall dysphoric post-natal women induced to ruminate were poorer at parental problem-solving (as assessed by the PPST), than dysphoric post-natal women induced to distract, non-dysphoric post-natal women induced to ruminate and non-dysphoric post-natal women induced to distract. The predicted hypothesis for parental problem-solving confidence was not supported. Dysphoric post-natal women induced to ruminate did not report lower parental problem-solving confidence than the dysphoric post-natal women induced to distract, non-dysphoric post-natal women induced to ruminate or distract. However, significant differences in confidence were seen between the dysphoric post-natal women induced to distract and non-dysphoric post-natal women induced to distract. No significant differences were seen between the dysphoric distraction group and non-dysphoric rumination group. The predicted hypothesis for mood was supported. Dysphoric post-natal women induced to ruminate did report lower mood than dysphoric post-natal women induced to distract and non-dysphoric post-natal women induced to ruminate or distract. Lower mood was also reported for dysphoric post-natal women induced to distract as compared non-dysphoric women induced to distract. No significant differences were, however, seen between the dysphoric distraction group and non-dysphoric rumination group.

The problem-solving results of the current study reflect the findings seen previously within the literature investigating the effects of rumination on social problem-solving in depressed and dysphoric individuals (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky et al., 1999; Watkins & Baracaia, 2002; Donaldson & Lam, 2004; Kao, Dristchel & Astell, 2006). However, previous research has not looked specifically at the implications of dysphoric rumination in parenting and parental problem-solving. The detrimental effects of

rumination's influence on parental problem-solving may hold consequences not only for how a mother copes with the demands of parenting but also for their developing infant. Research investigating the effects of PND on parenting has reported that mothers are less likely to engage in safety practices (McLearn et al., 2006a; 2006b; Zajicek-Farber, 2009) and spend less time engaging with their infants (Field, 2010). It could be argued, based upon the current findings, that rumination may play a part in reducing a mother's capacity to engage in parenting activities and solve problems surrounding infant care, as well as affecting the quality of engagement with their infant. The current study found that problem-solving effectiveness of dysphoric post-natal women induced to distract did not differ significantly from post-natal non-dysphoric women induced to ruminate or distract. This may indicate the benefits of distraction on parental problem-solving and provide possible advantages for PND or dysphoric mothers, who cannot avoid the tasks of parental problem-solving when caring for an infant.

Results of reported parental problem-solving confidence did not reflect some of the confidence reports seen in the literature. For example, both studies by Ward, et al., (2003) and van Radenborgh et al., (2009) found that ruminators were less confident and committed to their plans when investigating the effects of rumination on decision making. Possible explanations for the results seen in this study may reflect a feeling of achievement and subsequent confidence in completing the parental problem-solving tasks. Indeed, qualitative feedback from participants indicated that women were often pleased they were able to complete the tasks, noting 'the tasks weren't as bad as I thought', 'I was pleased I was able to answer the questions'. Mean results for confidence indicated that dysphoric women induced to distract reported lower confidence than dysphoric women induced to ruminate. Possible explanations for these findings may also relate to the self-reflecting nature of the rumination

inductions, as some research has shown that reflective pondering component of rumination can in fact be beneficial (Treyner, Gonzalez & Nolen-Hoeksema, 2003).

Overall the findings suggest that parenting confidence may not be adversely effected by rumination. The results may reflect the unavoidable nature of parental problem-solving, in that mothers are confident about their ability regardless of dysphoria or manipulation status as they have to complete problem-solving tasks on a daily basis in order to care for an infant. While reports of confidence did not reflect the predicted hypothesis, the effects of rumination have been seen in other aspects of this study, such as problem-solving and mood. The confidence findings in previous studies may have been due to ruminations contribution to the strategy of avoidance in that, within interpersonal problem-solving, an individual who is ruminating could use avoidance as a problem-solving strategy. Parental problem-solving cannot be avoided in the same way and, as a result, mothers who are ruminating are still required to undertake some form of action in order to solve a problem. If rumination contributes to poorer problem-solving and creates an opportunity to avoid we may predict that over time an individual's confidence in the task of problem-solving may reduce. However, if a mother is unable to avoid the task of parenting, it may be hypothesised that no effects on confidence would be seen. This may account for the results seen in this study.

In line with other studies, lower mood was reported by the dysphoric ruminators' group as compared to both the dysphoric distraction group and the control group which was induced to distract or ruminate (Nolen-Hoeksema & Morrow, 1993; Lyubomirsky & Nolen-Hoeksema, 1995; Donaldson & Lam, 2004). The dysphoric distraction group also reported significantly lower mood than the control distraction group. No significant differences were seen between the dysphoric distracters and control rumination group. These results highlight that, for the dysphoric distracters' group, distraction did not lead to an increased mood as

compared to the control distraction group. However, for the dysphoric distracters' group, distraction did increase mood and, accordingly, no significant difference was found between this group and the control rumination group. This suggests that distraction induction may have had some influence for the dysphoric group in increasing mood. However, it may also be a result of the rumination induction's influence on the both the control and the dysphoric groups. This study did not measure trait rumination, which may have influenced the findings. For example, a study by Donaldson & Lam (2004) found high levels of trait rumination overrode the benefits of distraction reported for depressed participants who had low levels of trait rumination. Therefore, it may be possible that the overriding negative effect of high levels of trait rumination may account for the current findings seen between the dysphoric distraction group and the control distraction group. Furthermore, the current study held unique methodological limitations (see limitations below), which may have influenced the ability for the distraction induction to significantly influence mood as compared to both control groups.

The present study adds to the literature surrounding rumination's influence on problem-solving, mood and confidence by extending the scope of the literature specifically to the post-natal period and parental problem-solving. It provides support for the response styles theory of rumination within a post-natal context and further provides some compensation for the paucity of research into specific mechanisms which may underpin post-natal depression. In addition it provides insight into how rumination may influence and affect a mother's capacity to engage with tasks and manage their dysphoric mood post-natally. This may in turn hold implications for further research theory links related to parenting and mothering such as attachment and bonding. It further holds clinical implications by highlighting the possible benefits of directly targeting rumination in post-natal dysphoria and depression, as it may reduce rumination's detrimental effects on problem-solving and low mood. Distraction

may further provide benefits to problem-solving as no significant differences were seen between non-dysphoric women and dysphoric women induced to distract. Therefore, simple time-limited distracting activities may encourage women to stay engaged and manage the demands of parenting problems without it leading to ruminative cycle and the additional adverse consequences associated with rumination such as reduced optimism, prolonged periods of distress, reduced motivation, social isolation and friction in relationships (Lyubomirsky & Nolen-Hoeksema, 1993; Nolen-Hoeksema & Morrow, 1993; Nolen-Hoeksema et al., 1994). This may be considered of great importance when considering the nature of parenting and poorer developmental outcomes identified among children of depressed mothers, alongside research that highlights poorer quality interaction between depressed mothers and their children. (Stein et al., 1991; Murray et al., 1999; Hay et al., 2001; Cornish et al., 2005; Pawlby et al., 2008; Murray et al., 2010). It may also be important to encourage motivation to engage with parenting activities such as visits to well-child clinics and safety practices. If the ruminative cycle associated with depression can be reduced by way of distraction, this will not only aid problem-solving, but it may increase a mother's availability for her infant and reduce some of the negative consequences associated with PND and mother-infant interactions seen within the post-natal literature.

## **Limitations**

The current study has a number of limitations that need to be considered in line with the findings. Measures of mood, confidence as well as screening measures used within the study were reliant on self-reporting and therefore could be open to different interpretation between participants. Furthermore, the women who took part in the study were screened using the EPDS which is not a diagnostic tool (Cox & Holden, 2001) and, as a result, the findings cannot be generalised to include clinically depressed mothers. However, past

research has shown that rumination has a negative influence on problem-solving and mood in clinically depressed participants (Watkins & Baracaia, 2002; Donaldson & Lam, 2004) this may indicate that similar findings would be replicated in clinically depressed mothers. As a result, future research investigating the effects of rumination in the post-natal period, may choose to focus upon clinically depressed mothers.

While every attempt was made to ensure that the PPST reflected real-life parenting problems, it may be criticised as an abstract task, that doesn't reflect real life. As a result, women may have responded differently to the imagined story than how they would have responded in real life. This may be particularly true in relation to a distressed infant, where the real-life situation would present the mother with multiple stimuli and tasks to actively complete, rather than imagine and respond by written means. The development of the PPST and scoring manual has only been used in two recent studies and, while Kappa inter-rater reliability was high, the measure may require further development over more participants to increase its reliability and validity.

Measures of problem-solving were not undertaken before the rumination or distraction induction, a repeated measures design may have provided greater information about the influence of rumination and distraction on parental problem-solving. Differences in confidence reports may additionally be seen if confidence was measured across the experiment (e.g. before the rumination or distraction induction, prior to undertaking the problem-solving, as well as after problem-solving). Again, this may provide greater information about parental problem-solving confidence than the current findings. This is therefore a consideration for future research. Additionally, as Donaldson and Lam (2004) highlighted in their investigations into interpersonal problem-solving, the relationship between parental problem-solving and dysphoria may be considered bidirectional, in that if a

mother is struggling with the demands of caring for an infant (and subsequently problem-solving) they may experience dysphoria/low mood/depression. In the same way, if a mother is experiencing dysphoria/low mood/depression they may struggle with the task of parenting and subsequent problem-solving.

Finally consideration of the participant group needs to be taken into account. The nature of recruiting women with young infants resulted in recruitment difficulties, with fewer numbers of dysphoric participants willing to take part. This in turn may have influenced the statistical power and results seen. Furthermore, it resulted in 31 (52.5%) mothers having their baby present and awake during the experiment. This may have influenced how mothers engaged in the rumination and distraction induction and therefore influenced the findings. This could account for the differences seen in distraction not increasing mood or influencing confidence for the dysphoric group as compared to the control distraction group, as seen in past research. Furthermore, the lists of statements used for the rumination and distraction induction were potentially irrelevant to the women in the study as the statements were not directly related to them. This, combined with the average hours of sleep reported by the women, may have resulted in tiredness and fatigue affecting their engagement with the task. Future research may wish to consider a different methodological approach to the induction task.

## **Conclusion**

The current study provides insight into the effects of rumination and distraction on parental problem-solving, mood and confidence and, in doing so, adds to literature surrounding specific mechanisms involved in post-natal depression. It may assist with targeting rumination in the treatment of post-natal depression and allow mothers to engage more fully with the task of parental problem-solving. There are unique methodological limitations which need to be considered when drawing exhaustive conclusions from this study. However, overall it adds to the literature pertaining to post-natal depression and dysphoria in relation to rumination and problem-solving. Future research may wish to build upon these findings and provide greater insight in the effects of rumination in the post-natal period.

## References

- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck Depression Inventory - Second Edition (BDI-II)* San Antonio, TX: The Psychological Corporation.
- Bennett, H. A., Einarson, A., Taddio, A., Koren, G., & Einarson, T. R. (2004). Prevalence of Depression During Pregnancy: Systematic Review. *Obstetrics & Gynecology, 103*, 698-709.
- Boneau, C. A. (1960). The effects of violations of assumptions underlying the t test. *Psychological Bulletin, 57*, 49-64.
- Butler, L. D., & Nolen-Hoeksema, S. (1994). Gender differences in responses to depressed mood in a college sample. *Sex Roles, 30*, 331-346.
- Clark, D. M., & Teasdale, J. D. (1985). Constraints on the effects of mood and memory. *Journal of Personality & Social Psychology, 48*, 1595-1608.
- Cornish, A. M., McMahon, C. A., Ungerer, J. A., Barnett, B., Kowalenko, N., & Tennant, C. (2005). Postnatal depression and infant cognitive and motor development in the second postnatal year: The impact of depression chronicity and infant gender. *Infant Behavior & Development, 28*, 407-417.
- Cox, J., & Holden, J. (2003). *Perinatal Mental Health, a guide to the Edinburgh Postnatal Depression Scale*. London: Gaskell.
- Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression. Development of the 10-item postnatal depression scale. *British Journal of Psychiatry, 150*, 782-786.
- Cox, J. L., Murray, D., & Chapman, G. (1993). A controlled study of the onset, duration & prevalence of postnatal depression. *British Journal of Psychiatry, 163*, 27-31.
- Donaldson, C., & Lam, D. (2004). Rumination, mood and social problem-solving in major

- depression. *Psychological Medicine*, 34, 1309-1318.
- Elliott, T. R., Shewchuk, R., Richeson, C., Pickelman, H., & Franklin, K. W. (1996). Problem-solving appraisal & the prediction of depression during pregnancy and in the postpartum period. *Journal of Counselling & Development*, 74, 645-651.
- Field, T. (1995). Infants of depressed mothers. *Infant Behavior & Development*, 18, 1-13.
- Field, T. (2010). Postpartum depression effects on early interactions, parenting and safety practices: a review. *Infant Behavior & Development*, 33, 1-6.
- Field, T., Diego, M., & Hernandez-Reif, M. (2009). Depressed mothers' infants are less responsive to faces & voices. *Infant Behavior & Development*, 32, 239-244.
- Gelfand, D. M., & Teti, D. M. (1990). The effects of maternal depression on children. *Clinical Psychology Review*, 10, 329-353.
- Hay, D. F., Pawlby, S., Sharp, D., Asten, P., Mills, A., & Kumar, R. (2001). Intellectual problems shown by 11-year-old children whose mothers had postnatal depression. *Journal of Child Psychology and Psychiatry*, 42, 871-889.
- Hernandez-Reif, M., Field, T., Deigo, M., Vera, Y., & Pickens, J. (2006). Happy faces are habituated more slowly by infants of depressed mothers. *Infant Behavior & Development*, 29, 131-135.
- Hewitt, C. E., Gilbody, S. M., Mann, R., & Brealey, S. (2010). Instruments to identify postnatal depression: Which methods have been the most extensively validated, in what setting and in which language? *International Journal of Psychiatry in Clinical Practice*, 14, 72-76.
- Hipwell, A. E., Reynolds, S., & Crick, E. P. (2004). Cognitive vulnerability to postnatal depressive symptomology. *Journal of Reproductive and Infant Psychology*, 22, 211-227.
- Jones, L., Scott, J., Cooper, C., Forty, L., Gordon-Smith, K., Sham, P., et al. (2010).

- Cognitive style, personality and vulnerability to postnatal depression. *British Journal of Psychiatry*, 196, 200-205.
- Jose, P. E., & Brown, I. (2008). When does the gender difference in rumination begin? Gender and age differences in the use of rumination by adolescents. *Journal of Youth & Adolescence*, 37, 180-192.
- Kao, C., Dritschel, B. H., & Astell, A. (2006). The effects of rumination and distraction on over-general autobiographical memory retrieval during social problem-solving. *British Journal of Clinical Psychology*, 45, 267-272.
- Lane, A., Keville, R., Morris, M., Kinsella, A., Turner, M., & Barry, S. (1997). Postnatal depression & elation among mothers & their partners: prevalence & predictors. *British Journal of Psychiatry*, 171, 550-555.
- Lovejoy, M. C., Grayczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression & parenting behavior: a meta-analytic review. *Clinical Psychology Review*, 20, 561-592.
- Lyubomirsky, S., Kasri, F., & Zehm, K. (2003). Dysphoric rumination impairs concentration on academic tasks. *Cognitive Therapy & Research*, 27, 309-330.
- Lyubomirsky, S., & Nolen-Hoeksema, S. (1993). Self-perpetuating properties of dysphoric rumination. *Journal of Personality & Social Psychology*, 65, 339-349.
- Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem solving. *Journal of Personality & Social Psychology*, 69, 176-190.
- Lyubomirsky, S., & Tkach, C. (2004). The consequences of dysphoric rumination. In C. Papageorgiou & A. Wells (Eds.), *Depressive Rumination, Nature, Theory & Treatment*. Chichester: Wiley & Sons.
- Lyubomirsky, S., Tucker, K. L., Caldwell, N. D., & Berg, K. (1999). Why ruminators are poor problem solvers: clues from the phenomenology of dysphoric rumination

- Journal of Personality & Social Psychology*, 77, 1041-1060.
- Martins, C., & Gaffan, E. A. (2000). Effects of early maternal depression on patterns of infant-mother attachment: A meta-analytic investigation. *Journal of Child Psychology & Psychiatry*, 41, 737-746.
- McLearn, K. T., Minkovitz, C. S., Strobino, D. M., Marks, E., & Hou, W. (2006). Maternal depressive symptoms at 2 to 4 months postpartum and early parenting practices. *Archives of Pediatric & Adolescent Medicine*, 106, 279-284.
- McLearn, K. T., Minkovitz, C. S., Strobino, D. M., Marks, E., & Hou, W. (2006). The timing of maternal depressive symptoms and mothers' parenting practices with young children: Implications for pediatric practice. *Pediatrics*, 118, e174-e182.
- Milgrom, J., & Beatrice, G., (2003). Coping with the stress of motherhood: cognitive and defence style of women with postnatal depression. *Stress & Health*, 19, 281-287.
- Murray, L., Arteche, A., Fearon, P., Halligan, S., Croudace, T., & Cooper, P. (2010). The effects of maternal postnatal depression and child sex on academic performance at age 16 years: A developmental approach. *Journal of Child Psychology and Psychiatry*, 51, 1150-1159.
- Murray, L., & Cooper, P. J. (1996). The impact of postpartum depression on child development. *International Review of Psychiatry*, 8, 55.
- Murray, L., Sinclair, D., Cooper, P., Ducournau, P., Turner, P., & Stein, A. (1999). The socioemotional development of 5-year-old children of postnatally depressed mothers. *Journal of Child Psychology and Psychiatry*, 40, 1259-1271.
- Nolen-Hoeksema, S. (1990). *Sex differences in depression*. Stanford: Stanford University Press.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, 100(4), 569-582.

- Nolen-Hoeksema, S. (1994). An interactive model of emergence of gender differences in adolescence. *Journal of Research in Adolescence* 4, 519-534.
- Nolen-Hoeksema, S. (2002). Gender differences in depression. In I. Gotlib & C. Hammen (Eds.), *Handbook of Depression*. New York: Guilford Press.
- Nolen-Hoeksema, S. (2004). The response styles theory. In C. Papageorgiou & A. Wells (Eds.), *Depressive Rumination, Nature, Theory & Treatment*. Chichester: Wiley & Sons.
- Nolen-Hoeksema, S., Larson, J., & Grayson, C. (1999). Explaining the gender difference in depressive symptoms. *Journal of Personality & Social Psychology*, 77, 1061-1072.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality & Social Psychology*, 61, 115-121.
- Nolen-Hoeksema, S., & Morrow, J. (1993). Effects of rumination and distraction on naturally occurring depressed mood. *Cognition & Emotion*, 7, 561-570.
- Nolen-Hoeksema, S., Parker, L. E., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality & Social Psychology*, 67, 92-104.
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on psychological science*, 3, 400-424.
- Papageorgiou, C., & Wells, A. (2004). Nature, functions, and beliefs about depressive rumination. In C. Papageorgiou & A. Wells (Eds.), *Depressive Rumination, Nature, Theory & Treatment*. Chichester: Wiley & Sons.
- Pawlby, S., Sharp, D., Hay, D., & O'Keane, V. (2008). Postnatal depression and child outcome at 11 years: The importance of accurate diagnosis. *Journal of Affective Disorders*, 107, 241-245.
- Platt, J. J., & Spivack, G. (1975). *Manual for the Means-Ends Problem-Solving (MEPS)*

*Procedure: a Measure of Interpersonal Cognitive Problem-Solving Skills.*

Philadelphia: Hahnemann Community Mental Health/Mental Retardation Centre.

- Radenborg, A. v., Jong-Meyer, R. d., & Huffmeier, J. (2009). Rumination fosters indecision in dysphoria. *Journal of Clinical Psychology, 66*, 1-20.
- Smith, J. M., & Alloy, L. B. (2009). A roadmap to rumination: a review of the definition, assessment, and conceptualization of this multifaceted construct. *Clinical Psychology Review, 29*, 116-128.
- Stein, A., Gath, D. H., Bucher, J., Bond, A., Day, A., & Cooper, P. (1991). The relationship between post-natal depression and mother-child interaction. *The British Journal of Psychiatry, 158*, 46-52.
- Stein, A., Arteche, A., Lehtonen, A., Craske, M., Harvey, A., Counsell, N., et al. (2010). Interpretation of infant facial expression in the context of maternal postnatal depression. *Infant Behavior and Development, 33*, 273-278.
- Stein, A., Lehtonen, A., Harvey, A. G., & Nicol-Harper, R. (2009). The influence of postnatal psychiatric disorder on child development. *Psychopathology, 42*, 11-21.
- Tatano-Beck, C., & Gable, R. (2001). Comparative analysis of the performance of the postpartum depression screening scale with two other depression instruments. *Nursing Research, 50*, 242-250.
- Teti, D. M., & Gelfand, D. M. (1991). Behavioural competence among mothers of infants in the first year: the mediational role of maternal self efficacy. *Child Development, 62*, 918-929.
- Teti, D. M., & Gelfand, D. M. (1997). Maternal cognitions as mediators of child outcomes in the context of postpartum depression. In L. Murray & P. J. Cooper (Eds.), *Postpartum Depression & Child Development*. New York: Guilford Press.
- Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A

- psychometric analysis. *Cognitive Therapy and Research*, 27, 247-259.
- Ward, A., Lyubomirsky, S., Sousa, L., & Nolen-Hoeksema, S. (2003). Can't quite commit: rumination & uncertainty. *Personality & Social Psychology Bulletin*, 29, 96-107.
- Watkins, E., & Baracaia, S. (2002). Rumination and social problem-solving in depression. *Behaviour Research & Therapy*, 40, 1179-1189.
- Wenzlaff, R. M. (2004). Mental control and depressive rumination. In C. Papageorgiou & A. Wells (Eds.), *Depressive Rumination, Nature, Theory & Treatment*. Chichester: Wiley & Sons.
- Yeung, C. A., Dalgleish, T., Golden, A.-M., & Schartau, P. (2006). Reduced specificity of autobiographical memories following a negative mood induction. *Behaviour Research and Therapy*, 44, 1481.
- Zajicek-Farber, M. L. (2009). Postnatal depression and infant health practices among high-risk women. *Journal of Child and Family Studies*, 18, 236-245

## **Extended Appendices**

## **Extended Appendices**

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## **Appendix A: Extended Introduction**

The introduction in the main manuscript provided the reader with an overview of the literature pertaining to the topic of rumination, problem-solving, mood and confidence within the post-natal period. However, due to the limited word count within the main manuscript this extended introduction expands on the areas related to the response styles theory of rumination, its links to gender and ruminations influence on problem-solving within a clinical population.

### **Rumination**

Rumination has been defined as “behaviours and thoughts that focus one’s attention on one’s depressive symptoms and on the implications of these symptoms” (Nolen-Hoeksema, 1991, p569). Rumination is characterised by abstract evaluative recurrent thought processes and has been associated with the overgeneralisation of thoughts and memories (Watkins, 2008). It involves persistent, re-cyclic depressive thinking and is a significant feature of dysphoria and depression. It involves repetitively and passively focusing upon symptoms of personal distress and the meaning associated with those symptoms without any focus upon possible action to alleviate these symptoms. Examples of ruminative thoughts include “why don’t I feel like doing anything?” and “I just can’t cope” (Nolen-Hoeksema, 2004; Papageorgiou & Wells, 2004; Nolen-Hoeksema Wisco & Lyubomirsky, 2008).

Nolen-Hoeksema (1991) proposed a response styles theory that suggests ruminative thinking maintains and intensifies depression by increasing negative thinking, impairs effective problem-solving and interferes with instrumental behaviour. In the context of depressed mood and depressive symptoms the theory proposes that rumination exacerbates and prolongs the depressive symptoms, increases the chronicity of symptoms and increases the likelihood that moderate symptoms will develop into a major depressive episode. It is

proposed that there are at least four ways that rumination may lead to prolonged depression. Firstly, it is proposed that rumination prolongs depression by activating negative thinking so an individual is more likely to use negative thinking to understand their circumstances. Secondly, rumination interferes with problem-solving, partly due to increasing pessimistic and fatalistic thinking. Thirdly, that rumination interferes with instrumental behaviour and lastly that ongoing ruminators may lose social support which in turn will lead to an increase in depressive symptoms (Nolen-Hoeksema, 2004; Nolen-Hoeksema et al., 2008).

The response styles theory is well supported by research indicating that rumination intensifies depression, negatively effects problem-solving, interferes with instrumental behaviour and can lead to a decline in social support (see Nolen-Hoeksema, 2004 for a review). Furthermore many studies have found correlations between rumination and a variety of maladaptive cognitive styles. These have included negative attributional styles, dysfunctional attitudes, hopelessness, pessimism, self-criticism, low mastery, dependency, sociotropy, neediness and neuroticism (Nolen-Hoeksema et al., 2008). The research therefore suggests that rumination in the post-natal period may hold many negative consequences for mothers.

### **Rumination and Gender**

The response styles theory was originally developed to account for the gender differences in depression rates between women and men. Women are twice as likely as men to suffer from an episode of major depression within their lives, report significantly higher levels of depressed mood than men and experience more minor symptoms of depression (Nolen-Hoeksema, 1994; 2002). Furthermore, research indicates that women are significantly more likely than men to ruminate as assessed by both self-report and experimental observation (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema, Larson & Grayson, 1999).

Nolen-Hoeksema (1991; 2004) proposes the reasons for the gender differences in rumination and depression rates is due to women feeling they have less control over their emotions, feeling greater responsibility for their relationships and perceiving themselves to be lower in mastery. If women place a greater focus on the emotional tone of their relationships and, as a consequence, are vigilant to every nuance of their relationships for both their emotional states and others (Nolen-Hoeksema, 2004) this may render a mother hypersensitive to the cues from their baby. This, coupled with low mastery and overgeneralisation in their thought processes, may lead a post-natally depressed mother to feel they are unable to meet the perceived demands of their baby and become caught in a ruminative cycle.

A number of studies have provided support for Nolen-Hoeksema's (1991) theory and as a result it has been suggested that rumination may mediate the gender gap in depression (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema et al., 1999). For example, Nolen-Hoeksema et al., (1999) undertook a study which tested the theory that women experience greater levels of chronic strain, have a lower sense of mastery and are more prone to rumination than men. Results indicated that each of these factors were greater in women and mediated the gender difference in depressive symptoms. Jose and Brown (2008) undertook a cross sectional non-clinical study of looking at whether increases in stress and rumination in early adolescence predicted the onset of gender differences in depression. Results exemplified females as reporting higher levels of stress, rumination and depression than males, while for adolescents aged 13 years or over rumination was found to mediate the relationship between gender and depression. Furthermore, Hilt, McLaughlin and Nolen-Hoeksema (2010) found higher levels of rumination resulted in increased depression symptoms over a seven month period in 7-17 year olds. Differences were also seen with higher rates of rumination reported by adolescent girls as compared to boys. Despite these

findings, gender differences in rumination have not been consistently reported in problem-solving studies (e.g. Watkins & Baracaia, 2002; Donaldson & Lam, 2004).

### **Research into the effects of rumination and problem-solving within clinical populations**

In line with the response styles theory and research concerning dysphoric participants, research into the effects of rumination on problem-solving in clinical populations has highlighted its detrimental effects. For example, Donaldson and Lam (2004) investigated the effects rumination and distraction on social problem-solving in participants experiencing a major depressive episode versus a control group. In doing so, they looked at the effects of both trait and induced rumination and distraction on the Means Ends Problem-solving task (MEPS; Platt & Spivack, 1975). Overall rumination had detrimental effects with both trait and induced rumination resulting in lower mood and less effective problem-solving for depressed participants. No effects, were seen for the control group. Distraction held some benefits for the depressed group where induced distraction improved mood and improved problem-solving. However, this was only seen where a participant's level of trait rumination was not considered to be occurring at a high level (as assessed by the Response Style Questionnaire (RSQ) Nolen-Hoeksema & Morrow, 1991). Trait distraction, however, had no effects on lifting mood or improving problem-solving. These results show some support for the benefits of induced distraction on problem-solving. However, they also indicate that where participants have high levels of trait rumination the benefits of distraction are not seen and rumination may override these benefits.

Watkins and Baracaia (2002) undertook a study looking at effects of trait and state orientated rumination on problem-solving by using the MEPS with participants who were experiencing current depression, those who had experienced depression previously and those with no depression history. Experimental manipulation involved three conditions, a 'no

question' condition, a condition focusing on state-orientated questions (e.g. "What am I doing wrong"), which were drawn from naturally occurring questions reported by dysphoric ruminators and a condition focusing upon process-focused questions (e.g. "How am I deciding on a way to solve this problem?"), which were designed to increase an awareness of problem-solving process and improve ability. Results indicated that overall the currently depressed group were poorer at problem-solving than both the recovered-depressed and the never-depressed groups. Process-focused questions improved problem-solving for the depressed group as compared to both the state-orientated and no questions conditions. For the recovered depressed group the state-orientated questions also detrimentally affected their problem-solving ability as compared to the process-focused questions. This study provides further evidence for the detrimental effects of rumination on problem-solving and the possible benefits of process orientated questions in participants experiencing a major depressive disorder.

While the current study relates to women considered dysphoric as opposed to those with a diagnosis of clinical depression it is important to consider how the results of Watkins and Baracaia (2002) and Donaldson and Lam (2004) studies may relate to the current research and to women with a diagnosis of post-natal depression.

## References

- Butler, L. D., & Nolen-Hoeksema, S. (1994). Gender differences in responses to depressed mood in a college sample. *Sex Roles, 30*, 331-346.
- Donaldson, C., & Lam, D. (2004). Rumination, mood and social problem-solving in major depression. *Psychological Medicine, 34*, 1309-1318.
- Hilt, L., McLaughlin, K. A., & Nolen-Hoeksema, S. (2010). Examination of the response styles theory in a community sample of young adolescents. *Journal of Abnormal Child Psychology, 38*, 545-556.
- Jose, P. E., & Brown, I. (2008). When does the gender difference in rumination begin? Gender and age differences in the use of rumination by adolescents. *Journal of Youth & Adolescence, 37*, 180-192.
- Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem solving. *Journal of Personality & Social Psychology, 69*, 176-190.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100*, 569-582.
- Nolen-Hoeksema, S. (1994). An interactive model of emergence of gender differences in adolescence. *Journal of Research in Adolescence 4*, 519-534.
- Nolen-Hoeksema, S. (2002). Gender differences in depression. In I. Gotlib & C. Hammen (Eds.), *Handbook of Depression*. New York: Guilford Press.
- Nolen-Hoeksema, S. (2004). The response styles theory. In C. Papageorgiou & A. Wells (Eds.), *Depressive Rumination, Nature, Theory & Treatment*. Chichester: Wiley & Sons.
- Nolen-Hoeksema, S., Larson, J., & Grayson, C. (1999). Explaining the gender difference in depressive symptoms. *Journal of Personality & Social Psychology, 77*, 1061-1072.

- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality & Social Psychology, 61*, 115-121.
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on psychological science, 3*, 400-424.
- Papageorgiou, C., & Wells, A. (2004). Nature, functions, and beliefs about depressive rumination. In C. Papageorgiou & A. Wells (Eds.), *Depressive Rumination, Nature, Theory & Treatment*. Chichester: Wiley & Sons.
- Watkins, E. (2008). Constructive & unconstructive repetitive thought. *Psychological Bulletin, 134*, 163-206.
- Watkins, E., & Baracaia, S. (2002). Rumination and social problem-solving in depression. *Behaviour Research & Therapy, 40*, 1179-1189.

## **Appendix B - Extended Methodology**

The methodology section in the main manuscript provides the reader with a description of the participants, design and procedure for the study. The extended methodology aims to provide further information on the materials and methodology and includes:

Recruitment Procedure	page 47
Counterbalancing procedure	page 48
Parental Problem-Solving Task (PPST)	page 49
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Beck Depression Inventory (BDI- II)	page 71
Edinburgh Post-natal Depression Scale (EPDS)	page 73
Demographic Information Sheet	Page 75
Visual Analogue Scale for Confidence	page 76
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Rumination and Distraction Induction	page 78
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Participant Information Sheet	page 87
Consent to Contact Form	page 90
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## **Recruitment procedures**

In order to recruit participants the following procedures were followed:

1. Health Visitor teams across Exeter, Mid, East and North Devon were contacted. Staff agreed to pass information on to women experiencing low mood/PND, where needed/necessary, staff agreed to return consent forms to the researcher.
2. GP record searches undertaken and letters sent to women experiencing PND across Exeter together with a reply SEA (other localities were unable to offer assistance in this area).
3. Mental Health Teams across Exeter, East and North Devon were contacted. Staff agreed to pass information on to women experiencing PND, where needed/necessary, staff agreed to return consent forms to the researcher.
4. Baby and toddler groups attended. Mothers approached and asked if they would be willing to take part in the research (Exeter, Tiverton, South Molton and Barnstaple x 15).
5. Posters and leaflets advertising the research displayed in Sure Start Children's centres (Exeter, Tiverton, South Molton and Barnstaple).
6. Nurseries across Exeter and Mid Devon contacted. Where nurseries agreed, leaflets were left for parents and posters displayed.
7. National Child Birth Trust groups attended via informal networks (x3).
8. Internet adverts placed on:
  - a. [www.exeterbabies.co.uk](http://www.exeterbabies.co.uk)
  - b. [www.netmums.com](http://www.netmums.com)
  - c. [www.mumsnet.co.uk](http://www.mumsnet.co.uk)

## Counterbalancing

In order to minimise any potential order effects of the problem-solving questions, the problem-solving questions were counterbalanced using a balanced Latin matrix design. Table 1 details the design used for both the dysphoric and control group.

Table 1: Balanced Latin Matrix

1	2	4	3
2	3	1	4
3	4	2	1
4	1	3	2

## Parental Problem-solving Task – PPST

### Problem-solving Exercises

#### Instructions:

The following are a number of problem situations. For each situation, you have been given the beginning of the story and how the story ends. **Your task is to write a story connecting the beginning that is given to you with the end that is given to you.** In other words, you are to provide a middle for each story. Try to imagine yourself experiencing the particular situation and describe in writing what you would do in that situation. For each situation please describe your ideal strategy for solving the problem giving as much detail as possible. Please describe your strategy in specific and concrete terms so that an outsider could follow your plan of action

1.The story starts:

**I have recently moved to a new town and have a 6 month old baby. I take a 30 minute bus ride to the town to do some shopping. After being in the town for 20 minutes my baby starts to cry and get distressed. On checking them, I discover that they have a dirty nappy which has leaked all over them and the buggy. I then discover I only have my bus pass and have left my wallet and spare nappies at home. My baby begins to become even more upset and lots of people start to look at me.**

The story ends:

**I am back at home and my baby is clean and happy.**

2. The story starts:

**I am a lone parent and have moved to a new area and want to make some new friends with other mums my age. I have a 3 month old baby and a two year old. I attend a parent and baby group with my children. My 3 month old baby starts to cry uncontrollably and refuses to settle and my two year old bites another child, which upsets another parent**

The story ends:

**I make some friends**

3. The story starts:

**I have an 8 month old baby and am worried about my baby's hearing. I have been to see my GP, who has reassured me that there is nothing to worry about. I am still very concerned about my baby's hearing.**

The story ends:

**I feel I have done all I can.**

4. The story starts:

**My baby has a runny nose and cold. I have a headache and think I may be coming down with something too. As I start to feel worse my baby becomes irritable, clingy and won't settle. Then I realise I used the last nappy an hour ago and am running short of food.**

The story ends:

**My baby and I are resting**

## **Parental Problem-Solving Task (PPST)– Scoring Manual**

In order to score the answers to the parental problem-solving task please follow the steps and criteria outlined below.

Before scoring, please read the answer in full, this will allow the story and content to be evaluated for overall logic and consistency and if a solution is given. In order to ascertain an overall problem-solving score, please use the following guidelines to score each question independently. A total score of all questions is then reached by adding the four individual question scores together to ascertain an overall score per participant.

### **Solution**

A solution is defined as any attempt to achieve the end outcome of the story e.g. I would get on the bus and go home. A solution needs to be a discreet step, not a general statement, e.g. ‘I do all the things to calm my baby’ is not a solution unless detail is added such as, rocking baby, checking nappy etc. An answer without a solution would be where no attempt has been made to either answer the question or achieve the end outcome e.g. I don’t know what I’d do.

- Is a solution given?
- Yes = 1 point.
- No = 0 point – do not continue to score.

### **Obstacles**

Does the participant note obstacles?

Do not score for any similar or repeated obstacles e.g. ‘if my mum couldn’t help I’d then...’ followed by ‘If my Mum still couldn’t help then...’.

An obstacle would be identified as something that might get in the way of reaching a solution. An obstacle would usually lead to developing an alternative solution.

e.g. 'if  $x$  won't help me, I'd .....

- 1 point for each obstacle.

### **More than one solution**

Is more than 1 solution given? Please score for each additional solution, however discreet.

e.g. cuddle, feed, check nappy, would be scored as 3. However, if an additional solution is a repetition or elaboration of the same or similar solution in one sentence, e.g. I would telephone a friend, my husband, mother or neighbour this would only be scored as one solution, where a similar solution is preceded by an obstacle and is presented as a discrete step it would be considered an additional solution.

- Following 1 point for initial solution, 1 point per additional solution.

### **Attending to Emotional Needs**

Does the participant attend to the emotional state of themselves and/or the baby. This may take the form of seeking reassurance from others people, relaxing, comforting.

Self e.g. 'I'd ask other mothers if they've experienced this before'

Baby e.g. 'I'd soothe or cuddle my baby'

- Yes = 1 point
- No = 0 point

Participants score only 1 point per answer, for each attendance to self and baby, (e.g. overall maximum score per answer is 2) no matter how many times they indicate attending to emotional needs.

### **Positive attributions**

Are positive attributions made about:

Self

Others

Baby

Does the participant show a positive way of thinking about themselves, others and their baby in relation to these scenarios? This needs to be an explicit statement about themselves, their baby or others not just implied. e.g. 'other people are usually nice to me when my baby cries', 'I wouldn't worry about what others thought' and 'It's okay for babies to cry that's how babies behave'.

- Yes = 1 point
- No = 0 point

Participants score 1 point per answer, for self, others and baby, (e.g. overall maximum score per answer is 3) no matter how many times they indicate positive attributions.

### **Overall Effectiveness Rating**

1. No solutions given; alternatively, steps given that would not be at all effective, easy to carry out or realistic, they may even be counter-productive.
2. Some indication of steps 'in the right direction', but not overly detailed, effective or easy to carry out in terms of reaching solution.
3. Outlining some steps in the right direction, but not with sufficient detail/purpose to suggest that steps would be successful or easy to carry out. No obstacles are noted.

4. Useful, potentially easy and successful steps at solving the problem listed, but without a sense of structure, elaboration about short/long term outcomes, sense of sequential unfolding of steps, or contingency. Some recognition of obstacles maybe present but not necessarily explicitly stated.
5. Moderately easy and successful solutions given, with a sense of structure and an indication of some recognition of obstacles and concepts of outcome/sequence/contingency.
6. Very good, relevant steps detailed, that are likely to result in the problem being solved. Overall, the response is well structured, presents some alternatives, an awareness of possible obstacles (this may include more than one being noted), suggests alternatives within the solution, reflects a sense of sequence and contingency and attempts to minimise negative consequences and maximises positive consequences.
7. Extremely effective solution provided, that would be easy to follow and certain to result in the problem being solved. The response is well structured, presents a range of alternatives, anticipates obstacles and suggests alternatives as to how to overcome them, reflects a sense of sequence and contingency and attempts to minimise negative consequences and maximises positive consequences.

## **Parental Problem-Solving Task (PPST) – Example Scoring**

The PPST was designed to generate problem solutions which take in to account multiple areas of caring for an infant. Adequate answers require the participant to conceptualise an effective way of managing a solution and bringing about a certain ending. As detailed previously, answers are scored by a number of domains (solutions, obstacles, attention to baby's and mother's needs, positive attributions and overall effectiveness). Detailed below are two example answers, followed by a more detailed outline of how answers may be scored.

### **Example 1.**

#### **Q1.**

*The story starts:*

**I have recently moved to a new town and have a 6 month old baby. I take a 30 minute bus ride to the town to do some shopping. After being in the town for 20 minutes my baby starts to cry and get distressed. On checking them, I discover that they have a dirty nappy which has leaked all over them and the buggy. I then discover I only have my bus pass and have left my wallet and spare nappies at home. My baby begins to become even more upset and lots of people start to look at me.**

First of all I would phone my husband, a friend or anyone local that I know and ask them to come and rescue me! Ideally my husband or someone who might also have access to nappies, wipes and a change of clothes for the baby. Failing that, someone who could bring money (to buy nappies & wipes and even baby clothes from town). Or at the very least, someone to collect both me and the baby in their car and take us home...and I might ask them to bring a

big towel so I could undress baby and wrap him up in that. I wouldn't worry about the car seat issue...this is an emergency!

If I could not get in touch with ANYONE, I would go into a Boots, Superdrug or Mothercare and appeal with them to give me the necessary provisions on credit – they can keep my wedding ring or iPhone as insurance! – to clean and re-dress baby. If this didn't work I would get a taxi (if they could put the poo-covered buggy in the boot) home and pay the driver once I had retrieved my wallet from inside.

*The story ends:*

**I am back at home and my baby is clean and happy.**

**Q2.**

*The story starts:*

**I am a lone parent and have moved to a new area and want to make some new friends with other mums my age. I have a 3 month old baby and a two year old. I attend a parent and baby group with my children. My 3 month old baby starts to cry uncontrollably and refuses to settle and my two year old bites another child, which upsets another parent**

I think that dealing with the biting toddler should take priority as I'd feel very embarrassed and guilty and would be aware of the other mums watching me / my reaction. I might ask one of the other mums to hold my screaming baby for 2 minutes while I dealt with the 2 yr old attacker, the victim and (more importantly!) the victim's mother. I'd make a show out of telling off my 2 yr old – probably more that I would if we were at home and he had just bitten a sibling or me! – so the other mums would respect me. The screaming baby would not

bother me as much as a) babies scream – that’s what they do and b) there’s no more accepting / understanding an environment as a mother & baby group! This incident would be the perfect ice-breaker...I’d be able to start talking to the mum who held the baby and the mother of the bite victim and hopefully invite them to my house for coffee to “make up for it”! With regard to the screaming baby I’d do all the usual things to try to calm it and if nothing worked I’d probably start to get worried as (SOMETHING usually works eventually ). Also I would not be able to supervise my 2 yr old properly or talk to the other mums over the noise, so I’d leave..but I’d go back the next week

*The story ends:*

***I make some friends***

**Q3.**

*The story starts:*

**I have an 8 month old baby and am worried about my baby’s hearing. I have been to see my GP, who has reassured me that there is nothing to worry about. I am still very concerned about my baby’s hearing.**

I’d Google it ‘til the cows come home! If I was still worried I’d talk to my HV about it. I know my HV well and in the past she has always referred my children on, if there’s any suggestion of a problem with ears / eyes etc even without me asking her to. So I know that if I DID ask, she’d refer us to the Audiology straight away.

*The story ends:*

**I feel I have done all I can.**

**Q4.**

*The story starts:*

**My baby has a runny nose and cold. I have a headache and think I may be coming down with something too. As I start to feel worse my baby becomes irritable, clingy and won't settle. Then I realise I used the last nappy an hour ago and am running short of food.**

I would phone my husband and ask him to pick up some nappies and provisions on the way home from work. If for some reason (eg he was working late doing a private function) and I felt too ill to go out myself, I would phone one of my brilliant local friends and call in a favour. In the meantime I would give baby a good dose of Calpol and keep offering him milk, and hold him until he fell asleep. I'd take some painkillers. If I literally had NO nappies and the baby has dirtied himself, I'd just make one out of a small hand towel!

*The story ends:*

**My baby and I are resting**

**An example of how answers are to be scored:**

**Q1.**

First of all I would phone my husband, a friend, or anyone local (SOLUTION) that I know and ask them to come and rescue me! Ideally my husband or someone who might also have access to nappies, wipes and a change of clothes for the baby. Failing that (OBSTACLE), someone who could bring money (to buy nappies & wipes and even baby clothes from town) (SOLUTION). Or at the very least, (OBSTACLE) someone to collect both me and the baby in their car and take us home (SOLUTION)...and I might ask them to bring a big towel so I could undress baby and wrap him up in that (SOLUTION). I wouldn't worry about the car seat issue...this is an emergency!

If I could not get in touch with ANYONE,(OBSTACLE) I would go into a Boots, Superdrug or Mothercare (SOLUTION) and appeal with them (ATTRIBUTION-OTHER) to give me the necessary provisions on credit – they can keep my wedding ring or iPhone as insurance! (SOLUTION) – to clean and re-dress baby. If this didn't work (OBSTACLE) I would get a taxi (SOLUTION) (if they could put the poo-covered buggy in the boot) home and pay the driver once I had retrieved my wallet from inside.

OVERALL EFFECTIVENESS = 6

**Q2.**

I think that dealing with the biting toddler should take priority as I'd feel very embarrassed and guilty and would be aware of the other mums watching me / my reaction. I might ask one of the other mums to hold my screaming baby for 2 minutes (SOLUTION) while I dealt with the 2 yr old attacker, the victim and (more importantly!) the victim's mother. I'd make a

show out of telling off my 2 yr old (SOLUTION) – probably more that I would if we were at home and he had just bitten a sibling or me! – so the other mums would respect me (ATtribution-OTHER). The screaming baby would not bother me as much as a) babies scream – that’s what they do (ATtribution-BABY) and b) there’s no more accepting / understanding an environment as a mother & baby group! (ATtribution OTHER) This incident would be the perfect ice-breaker ..I’d e able to start talking to the mum who held the baby and the mother of the bite victim (SOLUTION) and hopefully invite them to my house for coffee (SOLUTION) to “make up for it”! With regard to the screaming baby I’d do all the usual things to try to calm it (EMOTIONAL NEEDS OF BABY) and if nothing worked (OBSTACLE ) I’d probably start to get worried as (SOMETHING usually works eventually). Also I would not be able to supervise my 2 yr old properly or talk to the other mums over the noise (OBSTACLE), so I’d leave..but I’d go back the next week (SOLUTION).

OVERALL EFFECTIVENESS = 7

Q3.

I’d Google it ‘til the cows come home! (SOLUTION) If I was still worried (OBSTACLE) I’d talk to my HV about it. (SOLUTION) I know my HV well and in the past she has always referred my children on, (ATtribution-OTHER) if there’s any suggestion of a problem with ears / eyes etc even without me asking her to. So I know that if I DID ask, she’d refer us to the Audiology straight away.

OVERALL EFFECTIVENESS = 6

**Q4.**

I would phone my husband (SOLUTION) and ask him to pick up some nappies and provisions on the way home from work. If for some reason (eg he was working late doing a private function) (OBSTACLE ) and I felt too ill to go out myself (OBSTACLE ), I would phone one of my brilliant local friends (SOLUTION) and call in a favour (ATTRIBUTION-OTHER ). In the meantime I would give baby a good dose of Calpol (SOLUTION) and keep offering him milk (SOLUTION) , and hold him until he fell asleep (SOLUTION / EMOTIONAL NEEDS OF BABY). I'd take some painkillers (SOLUTION). If I literally had NO nappies and the baby has dirtied himself , (OBSTACLE) I'd just make one out of a small hand towel! (SOLUTION)

OVERALL EFFECTIVENESS = 6

## **Example 2**

**Q1.**

*The story starts:*

**I have recently moved to a new town and have a 6 month old baby. I take a 30 minute bus ride to the town to do some shopping. After being in the town for 20 minutes my baby starts to cry and get distressed. On checking them, I discover that they have a dirty nappy which has leaked all over them and the buggy. I then discover I only have my bus pass and have left my wallet and spare nappies at home. My baby begins to become even more upset and lots of people start to look at me.**

I go to Mothercare where I find other Mums in the baby change room and ask if anyone has a spare nappy. A very kind lady offers me a nappy and wipes to clean her with. In the baby change room there are some paper towels which I use to clean the buggy.

*The story ends:*

**I am back at home and my baby is clean and happy.**

**Q2.**

*The story starts:*

**I am a lone parent and have moved to a new area and want to make some new friends with other mums my age. I have a 3 month old baby and a two year old. I attend a parent and baby group with my children. My 3 month old baby starts**

**to cry uncontrollably and refuses to settle and my two year old bites another child, which upsets another parent**

I go to the parent and enquire after the other child and apologise to the parent who can see that I am struggling to settle my baby. The parent accepts the apology and starts to converse with me as she can see my distress. She introduces me to a couple of other parents one of which is also a single mum and we share experiences.

*The story ends:*

***I make some friends***

**Q3.**

*The story starts:*

**I have an 8 month old baby and am worried about my baby's hearing. I have been to see my GP, who has reassured me that there is nothing to worry about. I am still very concerned about my baby's hearing.**

I do some research on the Internet and take video clips of my baby referring to the behaviour that is causing concern and making me think there may be a hearing problem i.e. baby not responding to some sounds. I go to another GP to get a second opinion. I ask if I can see a specialist if it warrants further concern.

*The story ends:*

**I feel I have done all I can.**

#### **Q4.**

*The story starts:*

**My baby has a runny nose and cold. I have a headache and think I may be coming down with something too. As I start to feel worse my baby becomes irritable, clingy and won't settle. Then I realise I used the last nappy an hour ago and am running short of food.**

I take paracetamol and wrap myself and baby up warm and walk to the shops up the road to get more nappies and some food that is quick, nutritious and easy to prepare. The walk settles the baby and the baby falls asleep. We return home.

*The story ends:*

**My baby and I are resting**

**An example of how answers are to be scored:**

**Q1.**

I go to Mothercare (SOLUTION) where I find other Mums in the baby change room and ask if anyone has a spare nappy (SOLUTION). A very kind lady offers me a nappy and wipes (ATtribution-OTHER) to clean her with (SOLUTION). In the baby change room there are some paper towels which I use to clean the buggy (SOLUTION).

OVERALL EFFECTIVENESS = 3

**Q2.**

I go to the parent and enquire after the other child and apologise (SOLUTION) to the parent who can see that I am struggling to settle my baby. The parent accepts the apology and starts to converse with me as she can see my distress (ATtribution-OTHER). She introduces me (SOLUTION) to a couple of other parents one of which is also a single mum and we share experiences(SOLUTION).

OVERALL EFFECTIVENESS = 3

**Q3.**

I do some research on the Internet (SOLUTION) and take video clips (SOLUTION) of my baby referring to the behaviour that is causing concern and making me think there may be a hearing problem i.e. baby not responding to some sounds. I go to another GP to get a second opinion (SOLUTION). I ask if I can see a specialist if it warrants further concern (SOLUTION).

OVERALL EFFECTIVENESS = 3

**Q4.**

I take paracetamol (SOLUTION) and wrap myself and baby up warm (SOLUTION) and walk to the shops up the road to get more nappies and some food (SOLUTION) that is quick, nutritious and easy to prepare. The walk settles the baby and the baby falls asleep (SOLUTION). We return home.

OVERALL EFFECTIVNESS = 3

### **PPST Kappa Statistic**

In order to assess the reliability of scoring for the PPST, a Kappa inter-rater reliability analysis was performed to determine consistency among raters. Ten percent of problem scenarios were rated by an independent rater unaware of the manipulation (rumination or distraction) and dysphoric status. Kappa scores of 1 are considered to be perfect agreement between scorers. Interpretation of the Kappa scores can be seen in Table 2. The results of the Kappa analysis undertaken for the PPST can be seen in table 3 which indicate a substantial agreement of scores  $Kappa = 0.79$  ( $p < 0.001$ ).

Table 2: Interpretation of the Kappa scores.

<b>Kappa</b>	<b>Interpretation</b>
< 0	Poor agreement
0.0 – 0.20	Slight agreement
0.21 – 0.40	Fair agreement
0.41 – 0.60	Moderate agreement
0.61 – 0.80	Substantial agreement
0.81 – 0.99	Almost perfect agreement

Table 3. Result of the Kappa Analysis

<b>Symmetric Measures</b>					
		Value	Asymp. Std. Error <sup>a</sup>	Approx. T <sup>b</sup>	Approx. Sig.
Measure of Agreement	Kappa	.793	.186	4.055	.000
N of Valid Cases		6			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

### **Reference:**

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics* 33:159-174.

## MOOD DISORDERS CENTRE

## Beck Depression Inventory II

Please read each group of statements carefully, then pick out the **one statement** in each group which best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked.

If several statements in the group seem to apply equally well, simply circle the statement which has the largest number. Be sure that you do **not** circle more than one statement for Item 16 (change in sleeping pattern) and Item 18 (change in appetite).

**1 Sadness**

- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

**2 Pessimism**

- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

**3 Past Failure**

- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

**4 Loss of Pleasure**

- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

**5 Guilty Feelings**

- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

**6 Punishment Feelings**

- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

**7 Self Dislike**

- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

**8 Self Criticalness**

- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

**9 Suicidal Thoughts or Wishes**

- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

**10 Crying**

- 0 I don't cry any more than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying but I can't.

**11 Agitation**

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated I have to keep moving or doing something.

**12 Loss of Interest**

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

### 13 Indecisiveness

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

### 14 Worthlessness

- 0 I do not feel I am worthless.
- 1 I don't consider myself as worthwhile or useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

### 15 Loss of Energy

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

### 16 Change in Sleeping Pattern

- 0 I have not experienced any change in my sleeping pattern.
- 

1a I sleep somewhat more than usual.

1b I sleep somewhat less than usual.

---

2a I sleep a lot more than usual.

2b I sleep a lot less than usual.

---

3a I sleep most of the day.

3b I wake up 1-2 hours early and can't get back to sleep.

### 17 Irritability

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

### 18 Change in Appetite

- 0 I have not experienced any change in my appetite.
- 

1a My appetite is somewhat less than usual.

1b My appetite is somewhat greater than usual.

---

2a My appetite is much less than before.

2b My appetite is much greater than usual.

---

3a I have no appetite at all.

3b I crave food all the time.

### 19 Concentration Difficulty

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

### 20 Tiredness or Fatigue

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

### 21 Loss of Interest in Sex

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

# Edinburgh Postnatal Depression Scale<sup>1</sup> (EPDS)

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Your Date of Birth: \_\_\_\_\_

\_\_\_\_\_

Baby's Date of Birth: \_\_\_\_\_

Phone: \_\_\_\_\_

---

As you are pregnant or have recently had a baby, we would like to know how you are feeling. Please check the answer that comes closest to how you have felt **IN THE PAST 7 DAYS**, not just how you feel today.

Here is an example, already completed.

I have felt happy:

- Yes, all the time
- Yes, most of the time      This would mean: "I have felt happy most of the time" during the past week.
- No, not very often      Please complete the other questions in the same way.
- No, not at all

In the past 7 days:

- |   |   |
|---|---|
| 1. I have been able to laugh and see the funny side of things | *6. Things have been getting on top of me   |
| <input type="checkbox"/> As much as I always could            | <input type="checkbox"/> Yes, most of the time I haven't been able to cope at all |
| <input type="checkbox"/> Not quite so much now                | <input type="checkbox"/> Yes, sometimes I haven't been coping as well as usual    |
| <input type="checkbox"/> Definitely not so much now           | <input type="checkbox"/> No, most of the time I have coped quite well             |
| <input type="checkbox"/> Not at all                           | <input type="checkbox"/> No, I have been coping as well as ever                   |
| 2. I have looked forward with enjoyment to things             | *7. I have been so unhappy that I have had difficulty sleeping                    |
| <input type="checkbox"/> As much as I ever did                | <input type="checkbox"/> Yes, most of the time                                    |
| <input type="checkbox"/> Rather less than I used to           | <input type="checkbox"/> Yes, sometimes   |
| <input type="checkbox"/> Definitely less than I used to       | <input type="checkbox"/> Not very often   |
| <input type="checkbox"/> Hardly at all                        | <input type="checkbox"/> No, not at all   |
| *3. I have blamed myself unnecessarily when things went wrong | *8. I have felt sad or miserable  |
| <input type="checkbox"/> Yes, most of the time                | <input type="checkbox"/> Yes, most of the time                                    |
| <input type="checkbox"/> Yes, some of the time                | <input type="checkbox"/> Yes, quite often   |
| <input type="checkbox"/> Not very often                       | <input type="checkbox"/> Not very often   |
| <input type="checkbox"/> No, never                            | <input type="checkbox"/> No, not at all   |
| 4. I have been anxious or worried for no good reason          | *9. I have been so unhappy that I have been crying                                |
| <input type="checkbox"/> No, not at all                       | <input type="checkbox"/> Yes, most of the time                                    |
| <input type="checkbox"/> Hardly ever                          | <input type="checkbox"/> Yes, quite often   |
| <input type="checkbox"/> Yes, sometimes                       | <input type="checkbox"/> Only occasionally  |
| <input type="checkbox"/> Yes, very often                      | <input type="checkbox"/> No, never  |
| *5. I have felt scared or panicky for no very good reason     | *10. The thought of harming myself has occurred to me                             |
| <input type="checkbox"/> Yes, quite a lot                     | <input type="checkbox"/> Yes, quite often   |
| <input type="checkbox"/> Yes, sometimes                       | <input type="checkbox"/> Sometimes  |
| <input type="checkbox"/> No, not much                         | <input type="checkbox"/> Hardly ever  |
| <input type="checkbox"/> No, not at all                       | <input type="checkbox"/> Never  |

Administered/Reviewed by \_\_\_\_\_ Date \_\_\_\_\_

<sup>1</sup>Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-786 .

<sup>2</sup>Source: K. L. Wisner, B. L. Parry, C. M. Piontek, Postpartum Depression N Engl J Med vol. 347, No 3, July 18, 2002, 194-199

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# Edinburgh Postnatal Depression Scale<sup>1</sup> (EPDS)

Postpartum depression is the most common complication of childbearing.<sup>2</sup> The 10-question Edinburgh Postnatal Depression Scale (EPDS) is a valuable and efficient way of identifying patients at risk for “perinatal” depression. The EPDS is easy to administer and has proven to be an effective screening tool.

Mothers who score above 13 are likely to be suffering from a depressive illness of varying severity. The EPDS score should not override clinical judgment. A careful clinical assessment should be carried out to confirm the diagnosis. The scale indicates how the mother has felt **during the previous week**. In doubtful cases it may be useful to repeat the tool after 2 weeks. The scale will not detect mothers with anxiety neuroses, phobias or personality disorders.

Women with postpartum depression need not feel alone. They may find useful information on the web sites of the National Women’s Health Information Center <[www.4women.gov](http://www.4women.gov)> and from groups such as Postpartum Support International <[www.chss.iup.edu/postpartum](http://www.chss.iup.edu/postpartum)> and Depression after Delivery <[www.depressionafterdelivery.com](http://www.depressionafterdelivery.com)>.

## SCORING

### QUESTIONS 1, 2, & 4 (without an \*)

Are scored 0, 1, 2 or 3 with top box scored as 0 and the bottom box scored as 3.

### QUESTIONS 3, 5-10 (marked with an \*)

Are reverse scored, with the top box scored as a 3 and the bottom box scored as 0.

Maximum score: 30  
Possible Depression: 10 or greater  
Always look at item 10 (suicidal thoughts)

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## Instructions for using the Edinburgh Postnatal Depression Scale:

1. The mother is asked to check the response that comes closest to how she has been feeling in the previous 7 days.
2. All the items must be completed.
3. Care should be taken to avoid the possibility of the mother discussing her answers with others. (Answers come from the mother or pregnant woman.)
4. The mother should complete the scale herself, unless she has limited English or has difficulty with reading.

<sup>1</sup>Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-786.

<sup>2</sup>Source: K. L. Wisner, B. L. Parry, C. M. Piontek, Postpartum Depression N Engl J Med vol. 347, No 3, July 18, 2002, 194-199

Identification No:

Results of EPDS:

**All information will remain private and confidential and will not be linked to your name and address.**

**How old are you?**

**What is your marital status?** Married / Single / Co-habiting / Divorced / Widowed  
(Please circle/delete as appropriate)

**How would you describe your ethnicity?**  
(Please circle/delete as appropriate)

White:	British	Irish	Other white background	
Mixed:	White and Black Caribbean	White and Black African	White and Asian	Other mixed background
Asian or Asian British:	Indian	Pakistani	Bangladeshi	Other Asian background
Black or Black British:	Caribbean	African	Other Black background	
Chinese or Other Ethnic Groups:	Chinese	Other ethnic group		

**What level of educational did you complete?** (Please circle/delete as appropriate)  
Secondary school no GCSEs / GCSE's / College or A'levels / University / University Degree / Postgraduate

**What is your yearly household income?**

**How many children do you have living in your household?**

**What are the ages of your children?**

**On average how many hours sleep have you had per night in the last week** (for example, if you have had a good night and bad night average them out):

**Visual Analogue Scale for Parental Confidence – VAS-C**

Please indicate how confident you are in solving problems surrounding your baby.

Please place a line on the scale below, with 0 indicating that you have low confidence in problem solving with your child and 100 indicating high confidence.

0

100



**Visual Analogue Scale for Mood – VAS-M**

Please indicate your current level of mood by placing a line on the scale below, with 0 indicating low mood and 100 indicating high mood

0

100



## **Rumination and Distraction Induction**

The rumination and distraction induction procedure replicated that developed by Nolen-Hoeksema & Morrow (1993) whereby participants are asked to focus their attention upon a series of statements. For the rumination condition participants are asked to focus upon statements that were designed to promote thoughts related to emotions, behaviours and the self and for the distraction condition participants are asked to focus upon statements designed to focus thoughts and attention externally. Lists of statements to be used within this study are outlined below.

## **Distraction Condition Instructions and Statements**

For the next few minutes, try your best to focus your attention on each of the ideas on the following pages.

Read each item slowly and silently to yourself. As you read the items, use your imagination and concentration to focus your mind on each of the ideas. Spend a few moments visualising and concentrating on each item.

*Think about:*

and imagine a boat slowly crossing the Atlantic

*Think about:*

the layout of a typical classroom

*Think about:*

the shape of a large black umbrella

*Think about:*

the movement of an electric fan on a warm day

*Think about:*

raindrops sliding down a window pane

*Think about:*

a double-decker bus driving down a street

*Think about:*

and picture a full moon on a clear night

*Think about:*

clouds forming in the sky

*Think about:*

the layout of the local shopping centre

*Think about:*

and imagine a plane flying overhead

*Think about:*

fire darting round a log in a fire-place

*Think about:*

and concentrate on the expression on the face of the *Mona Lisa*

*Think about:*

the car park at a large supermarket

*Think about:*

two birds sitting on a tree branch

*Think about:*

the shadow of a stop sign

*Think about:*

the layout of the local post office

*Think about:*

the structure of a high-rise office building

*Think about:*

and picture the Eiffel Tower

*Think about:*

and imagine a lorry load of apples

*Think about:*

the pattern on an Oriental rug

*Think about:*

the 'man in the moon'

*Think about:*

the shape of the continent of Africa

*Think about:*

a band playing outside

*Think about:*

a group of polar bears fishing in a stream

*Think about:*

the shape of Sydney Opera House

*Think about:*

the shape of Great Britain

*Think about:*

the way Stonehenge looks at sunset

*Think about:*  
the outline of the Houses of Parliament

*Think about:*  
a train stopped at a station

*Think about:*  
a lone cactus in the desert

*Think about:*  
the shape of the country Italy

*Think about:*  
a row of shampoo bottles on display

*Think about:*  
a petrol station on a major road

*Think about:*  
the fuzz on the shell of a coconut

*Think about:*  
the queens' head on a stamp

*Think about:*  
a band playing the National Anthem

*Think about:*  
the shape of a cello

*Think about:*  
the birthmark on Gorbachev's head

*Think about:*  
the shape of the United States of America

*Think about:*  
the baggage claim area at the airport

*Think about:*  
the size of the Statue of Liberty

*Think about:*  
the shape of a cricket bat

*Think about:*

a freshly painted door

*Think about:*

the shiny surface of a trumpet

*Think about:*

a kettle coming to the boil

## **Rumination Condition Instructions and Statements**

For the next few minutes, try your best to focus your attention on each of the ideas on the following pages.

Read each item slowly and silently to yourself. As you read the items, use your imagination and concentration to focus your mind on each of the ideas. Spend a few moments visualising and concentrating on each item.

*Think about:*

the physical sensations you feel in your body

*Think about:*

your character and who you strive to be

*Think about:*

the degree of clarity in your thinking right now

*Think about:*

why you react the way you do

*Think about:*

the way you feel inside

*Think about:*

the possible consequences of your current mental state

*Think about:*

how similar or different you are relative to other people

*Think about:*

what it would be like if your present feelings lasted

*Think about:*

why things turn out the way they do

*Think about:*

trying to understand your feelings

*Think about:*

how awake or tired you feel now

*Think about:*

the amount of tension in your muscles

*Think about:*

whether you are fulfilled

*Think about:*

your physical appearance

*Think about:*

whether you feel stressed right now

*Think about:*

the long-term goals you have set

*Think about:*

the amount of certainty you feel

*Think about:*

your present feelings of fatigue or energy

*Think about:*

possible explanations for your physical sensations

*Think about:*

how hopeful or hopeless you are feeling

*Think about:*

the level of motivation you feel right now

*Think about:*

the degree of helplessness you feel

*Think about:*

the degree of calmness or restlessness you feel

*Think about:*

the possible consequences of the way you feel

*Think about:*

what your feelings might mean

*Think about:*

how sad or happy you are feeling

*Think about:*

the expectations your family has for you

*Think about:*

why your body feels this way

*Think about:*

why you get this way sometimes

*Think about:*

how passive or active you feel

*Think about:*

what people notice about your personality

*Think about:*

how optimistic or pessimistic you feel about the future

*Think about:*

how weak or strong your body feels right now

*Think about:*

the degree of relaxation or agitation you feel

*Think about:*

the kind of person you think you should be

*Think about:*

the degree of control you feel right now

*Think about:*

what would happen if your current physical state lasted

*Think about:*

sitting down and analysing your personality

*Think about:*

why you turned out this way

*Think about:*

the things that are most important in your life

*Think about:*

how quick or slow your thinking is right now

*Think about:*

the degree of decisiveness you feel

*Think about:*

trying to understand who you are

*Think about:*

how you feel about your friendships

*Think about:*

whether you have accomplished a lot so far

## **Problem solving, mood and confidence in the post-natal period Participant Information Sheet**

My name is Alexandra Boyd and I am a Trainee Clinical Psychologist, undertaking a doctorate degree at Exeter University. I have a special interest in how certain ways of thinking (i.e., rumination) affect mood and problem-solving during the post-natal year. I am a NHS employee but I am not specifically being paid to conduct this study.

I would like to invite you to take part in this study. However, before you make a decision whether or not you would like to take part, please read this information sheet carefully. If you have any questions after reading this, please feel free to contact me directly (contact details are given above). Thank you for taking the time to read this.

### **Summary of the study**

This study aims to look at how rumination, style of thinking, affects how mothers of small babies solve problems and if mothers with post-natal depression\* (PND) problem solve differently as compared to women who do not have PND. Should you agree to participate, you will be asked to take part in a research project which involves answering some questionnaires about how you are feeling and undertaking four problem-solving exercises. It will take approximately 70 minutes of your time in total and will involve being contacted by telephone or email followed by meeting with a researcher. This will be either at your home or in a neutral location, such as your Health Centre or Children's Centre. The study has been reviewed and approved by the South West 2 NHS Research Ethics Committee.

### **Aim of the study**

We know that the post-natal period can be a busy time for women and involves solving problems about the care and attention of a new baby who does not yet know how to speak! Asking women who have a new baby about how they, as a mother think, undertake and feel about problems that may arise, helps us to establish how we can help them within this period to manage difficult problems. For example, does the way we think about the problem affect how we solve the problem? What would help a mother manage better?

### **Why have I been invited?**

You have been chosen because you have had a baby within the last year and you may be suitable to take part in our study. In order to understand the differences in problem-solving, mood and confidence between women who are depressed or not depressed following the birth of their baby we are aiming to recruit women with and without PND, 64 women in total will be involved in the study. I would therefore like to talk with you about the possibility of taking part in this study.

### **Do I have to take part?**

It is up to you whether or not to take part. I will be recruiting women between October 2010 and March 2011, giving you time to think about whether you would like to take part. You will be given a minimum of a month to decide if you wish to take part and during this time you may wish to discuss information contained in this sheet and whether or not you would like to take part with other people such as friends, family, your health visitor or GP. Alternatively you may wish to contact the researcher to ask any further questions. If you do decide to take part, please return the 'consent to contact' sheet which is enclosed with this pack or contact me via the details at the top

of this sheet. If you decide to take part you are still free to end your participation at any time and without giving a reason. A decision to stop at any time, or a decision not to take part, will not affect any treatment or the standard of care you currently receive. As the research involves written English it is important that participants hold a comprehensive understanding of the English language. This is due to the possible effects of English as a second language may have on the research. Therefore only women who speak English as their first language will be included in the study. Other exclusions will include women experiencing psychosis as this may have an influence on responses to the problem-solving exercises. The researcher reserves the rights to withdraw participants from the study at any time without giving a reason.

As a way of thanking you for considering the study, completed consent to contact forms will be entered into a prize draw. You will still be considered for the prize draw if following initial contact with the researcher you decided not to take part. Six prizes, each of £20 in vouchers, are available. Each winner will be able to choose whether they would like the prize to be in the form of a voucher for Mothercare, Boots, Amazon, a local health and beauty spa or another high street retailer.

### **What will happen to me if I take part? What do I have to do?**

If you decide to take part in the study, please complete the enclosed consent to contact sheet. You will then be contacted by email or telephone where you will be asked to answer some questions related to post-natal depression (the Edinburgh Post-natal Depression Scale) you may have already answered these questions with your midwife or health visitor. The questions will be used to assess your mood and depression status and are a routine measure of mood used in the NHS for women post-natally. This will take approximately 10 minutes. If it is highlighted that you may be suffering from Post-natal depression and you were not aware of this, permission would be sought to contact your health visitor and GP. We will also explain the difficulties of experiencing low mood and depression and how you may access help.

Following this a one off meeting with me, or my colleague will be arranged where you will be asked to complete a consent form (which states you agree to take part and are happy for your GP to be informed of your participation). We would then ask you some questions about yourself (for example, age, race, number of children you have), how you feel (your mood and confidence) before asking you to undertake an experiment where you will be asked to focus upon a list of ideas and undertake four problem-solving tasks (taking approximately an hour in total). There are two sets of ideas to focus upon and you will be assigned to one set at random (this means being allocated to each set of idea by chance, like tossing a coin). You will be given a signed copy of your consent form and an information sheet to keep during the experiment. Your answers to the questions we ask at the beginning of the experiment will determine if your data will become part of the PND group of participants.

All your personal details will remain confidential and secure; the reported results of the research will only include information about the range of participants who took part (e.g average age, number of children, results of questionnaires and problem-solving outcomes). Confidentiality will be maintained unless there are concerns for you or your baby's safety, where your GP/Health Visitor or social services will be informed.

### **What are the possible disadvantages of taking part?**

Being part of this research will involve you giving up your time to answer some questions. You will be asked to complete some questionnaires and undertake 4 parent focused problem-solving tasks. The possible disadvantages of taking part are that you may feel lower in mood following the experiment (although past research indicates this is unlikely) or that the questionnaires you complete may highlight a level of low mood or depression you weren't aware of. If either of these things occur the researcher will talk through the effects of low mood and how you may access help. If you wish the researcher could contact your GP or Health Visitor to inform them of this outcome. You

will be given the opportunity at the end of the task to discuss any difficult or upsetting feelings with the researcher. If you experience continued low mood or worries we would advise you to contact your GP or Health visitor. If they are unavailable due to working hours we suggest you call NHS direct or the Samaritans, who are available 24 hours a day.

- NHS Direct 0845 4647.
- Samaritans 08457 909090

The following help lines may also be useful should you be concerned about or wish to access information about PND.

- The 'Meet A Mum Association' post-natal helpline (0845 120 3746), is available Monday to Friday between 7pm and 10pm.
- 'The Association for Post-natal Illness' post-natal helpline (020 7386 0868) is available Monday to Friday between 10am and 2pm.

### **What are the possible benefits of taking part?**

The information we get from this study should help us to work with mothers in the future who find problem-solving difficult. There is no immediate clinical benefit but it is hoped that it will inform future interventions for women suffering from post-natal depression and aid problem-solving following child birth.

### **What would happen if we were concerned about the safety of you or your baby?**

We are aware that being a mother to a young baby can be a stressful. If, from talking with you, we become concerned that either you or your child are at risk of harm, we would take steps to make sure you and your child are safe. These steps may include speaking to your GP, Health Visitor or Social Services. Whenever possible, we would first discuss this with you. If however, we were very concerned about either you or your baby confidentiality may be broken in line with NHS and Exeter University Mood Disorders Centre risk and child protection policies, where your GP/Health Visitor or Social Services would be informed.

### **What will happen to the results of the study?**

I aim to publish the work in an academic journal in the autumn of 2011. Upon request, I will provide you with an information sheet about the results of the research, details of where it will be published and how you can obtain a copy. Your identity will not be revealed in any report or publication. Our research is often reported on the Mood Disorders Centre website at: <http://www.centres.ex.ac.uk/mood>

### **Contact for further information**

If you have any further questions please feel free to talk to Alex Boyd, the study's Principal Investigator on Tel: 07890799321 Email: [acb213@exeter.ac.uk](mailto:acb213@exeter.ac.uk) /[alexboyd@nhs.net](mailto:alexboyd@nhs.net) (or see above for postal address)

If for any reason you wish to make a complaint about the researcher or concerning adverse effects from the experiment please contact Dr Heather O'Mahen on the above address or at [H.O'Mahen@exeter.ac.uk](mailto:H.O'Mahen@exeter.ac.uk) or Tel: 01392 264645. Alternatively please contact the Patient Advice and Liaison Service (PALS) on 0845 111 0080 who are available to advise on all complaints procedures for staff and research undertaken within the NHS.

### ***Thank you for taking the time to read this information sheet and consider taking part in the study.***

*Post-natal depression is a mental health condition experienced by women following child birth and is associated with feeling of low mood, irritability, hopelessness and a loss of interest in things. For more information see [www.patient.co.uk](http://www.patient.co.uk)*



**PLEASE RETURN TO:**

Alexandra Boyd  
Department of Clinical Psychology  
University of Exeter  
Washington Singer Building  
Exeter, EX EX4 4QG  
Email: [acb213@exeter.ac.uk](mailto:acb213@exeter.ac.uk)  
Tel: 07890799321

**Problem-solving, mood and confidence in the post-natal period**

I am interested in finding out more about the above study and am aware that by completing and returning this form Alex Boyd will contact me about the study where I will be asked some of questions relating to post-natal depression (the Edinburgh Post-natal Depression Scale).

**Name:** .....

**Contact details:**

**Address:** .....

.....

.....

**Telephone no:** .....

**Email:** .....

**Preferred contact type (telephone, email, post):** .....

**Signature:** .....

**Date:** .....



Alexandra Boyd  
 Department of Clinical Psychology  
 University of Exeter  
 Washington Singer Building  
 Exeter, EX4 4QG  
 Email: [acb213@exeter.ac.uk](mailto:acb213@exeter.ac.uk) /  
[alexboyd@nhs.net](mailto:alexboyd@nhs.net)  
 Tel: 07890799321

**Problem-solving, mood and confidence and in the post-natal period**  
**Participant Consent Form**

Name of researcher: Alexandra Boyd

Please initial each box

- |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
| <ol style="list-style-type: none"> <li>1. I confirm that I have read and understand the information sheet for the above study (Ref: 05.09.2010 Version 4). I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.</li> <li>2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason and that my post-natal care will not be affected.</li> <li>3. I confirm and consent to details of my participation in the study being provided to my GP</li> <li>4. I understand that my personal details will be kept secure and no identifiable details will be used as part of the research results.</li> <li>5. I agree to take part in the study.</li> </ol> | <table border="1" style="border-collapse: collapse; width: 80px; height: 200px;"> <tr><td style="width: 80px; height: 50px;"></td></tr> </table> |  |  |  |  |  |
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\_\_\_\_\_  
Participant Name

\_\_\_\_\_  
Signature:

\_\_\_\_\_  
Date

\_\_\_\_\_  
Researcher Name

\_\_\_\_\_  
Signature:

\_\_\_\_\_  
Date

Ms Alexandra Boyd  
Department of Clinical Psychology  
University of Exeter  
Washington Singer Building  
Exeter  
EX4 4QG

Royal Devon and Exeter  
Hospital (Wonford)  
Barrack Road  
Exeter  
EX2 5DW

Tel: 01392 411611

**GENERAL MANAGEMENT**

Direct dial: 01392 403919

Direct Fax: 01392 403911

Email: [Medical.Director@rdehc-tr.swest.nhs.uk](mailto:Medical.Director@rdehc-tr.swest.nhs.uk)

Ref: VP/MC/R&D/DM

14 October 2010

Dear Ms Boyd

**Study Title: Effects of Rumination on Problem-solving in Post-natal Depression**  
**R&D Ref: 1114488 MREC Ref: 10/H0206/33**

I have reviewed the Trust R&D file for your study and I note that this study received ethical approval from the South West 2 Research Ethics Committee dated 23/09/2010. I am happy to give approval on behalf of the Trust.

The documentation approved for use with this study is listed on a separate sheet:

**Research Governance**

The Director of Research and Development has asked me to remind you of your responsibilities as an NHS researcher, which are:

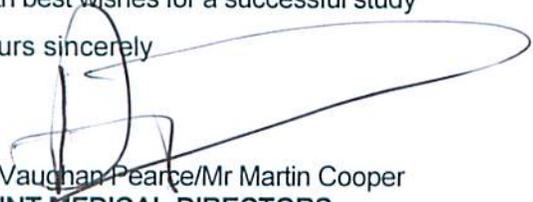
1. Work must be carried out in line with the new Research Governance Framework for Health and Social Services, which details the responsibilities for everyone involved in research.

More information about all these responsibilities can be found on the Department of Health Research and Development web pages at:

<http://www.dh.gov.uk/en/Policyandguidance/Researchanddevelopment/A-Z/Researchgovernance/index.htm>

With best wishes for a successful study

Yours sincerely



Dr Vaughan Pearce/Mr Martin Cooper  
**JOINT MEDICAL DIRECTORS**

Cc R&D Study File

Doc Name	Version	Date	Date of letter from ethics
Protocol		10-Mar-10	23/09/2010
Participant Information Sheet	V4	05/09/2010	23/09/2010
Letter To GP	V1	21/05/2010	23/09/2010
Edinburgh Postnatal Depression Scale			23/09/2010
SCID Baseline Template Score Sheet			23/09/2010
Beck Depression Inventory -II			23/09/2010
Visual Analogue Scale - Parental Confidence			23/09/2010
Visual Analogue Scale - Mood			23/09/2010
Response to Request Further Info.	V4	05/09/2010	23/09/2010
Contact Sheet/Consent	V3	17/08/2010	23/09/2010

Research and Development Directorate  
Wonford House Hospital  
Dryden Road  
EXETER EX2 5AF

Tel: 01392 675689/208765  
Fax: 01392 403445

Email: stevencard@nhs.net

06/10/2010

Alex Boyd  
Director of Research DClinPsy  
Mood Disorders Centre  
University of Exeter  
Washington Singer Building  
Exeter  
EX4 4QG

Dear Alex Boyd,

**Re: Study R&D Code: DPT 0185**

**Study Title: Effects of Rumination on Problem-Solving, Mood & Confidence in Post-natal Depression.**

I have reviewed the Trust R&D file for your study and am happy to give approval on behalf of the Devon Partnership NHS Trust.

Devon Partnership NHS Trust Approval is granted on condition that the documents and procedures used are in accordance with those approved by the Research Ethics Committee and those which have been submitted to the Trust for the R&D file. These are:

Investigator CV	01 May 2010
Protocol	10 March 2010
Check List	Version 3
Contact Sheet	Version 3
Visual Analogue Scale for Parental Confidence	
Letter from Sponsor	17 May 2010
SCID Baseline Template Score Sheet	
Participant Information Resources Sheet	Version 1
Problem Solving Exercises	Version 1
REC application	Version 2.5
Covering Letter	01 June 2010
Covering Letter	17 August 2010
Letter of invitation to participant	Version 1
Participant Information Sheet	Version 4
Response to Request for Further Information	17 August 2010
Response to Request for Further Information	07 Sept 2010
Questionnaire: Edinburgh Postnatal Depression Scale	
Questionnaire: Beck Depression Inventory -II	
CV Alexandra Boyd	
Visual Analogue Scale for Mood	
Feedback form for literature review	
Letter to the GP informing them of their patients participation in the study	21 May 2010

You are reminded that you must report to the R&D office any **adverse event or serious incident**, whether or not you feel it is serious. This requirement is in addition to informing the Chairman of the Research Ethics Committee which approved the study. You are also required to submit to the R&D office a **final outcome report** on completion of your study, and to provide interim reports on progress as requested. Should **publications** arise, please send copies to the R&D office, Wonford House for inclusion in the study's R&D file and the Trust's research publications library.

I would also like to remind you of the responsibilities of anyone who conduct research within the NHS, which are:

1. Work must be carried out in line with the research governance framework, which details the responsibilities for everyone involved in research.
2. The Data Protection Act requires that you follow the eight principles of 'good information handling' as summarised in the guide for staff.
3. You must be aware of, and comply with Health and Safety standards in relation to your research

More information about these responsibilities is available from the R&D Office.

Can you please email electronic versions of all relevant paperwork relating to this study to [stevencard@nhs.net](mailto:stevencard@nhs.net). for our records.

With best wishes for a successful study.

Yours sincerely



Dr Peter Aitken  
Director of Research & Development

Dr Heather O'Mahen  
Director of Research DClinPsy  
Mood Disorder Centre  
University of Exeter  
Washington Singer Building  
Exeter EX4 4QG

**Devon Primary Care Trust**  
NHS Devon Research Support Service,  
1<sup>st</sup> Floor (above St Leonard's Pharmacy),  
Athelstan Road,  
Exeter,  
EX1 1SB.

8th October 2010

IL/DRSS/CB

Dear Dr O'Mahen

**Study No: PCT0784 (REC ref 10/H0206/33) Title Effects of Rumination on Problem-solving, Mood & Confidence in Post-natal Depression.**

I have reviewed the Trust Research Governance file for your study. I am happy to give approval on behalf of the Trust. This approval extends to the study being carried out in NHS Devon

**Adverse Events**

Can I remind you that you must report to the Research Support Service any serious adverse event occurring during the study quoting the study reference number. This requirement is in addition to informing the Chairman of the Local Ethics Committee.

**Outcome and publications**

You must also submit to the Research Support Service a final outcome report on completion of your study. If your study takes longer than a year annual reports on progress will be needed. If you publish please send copies to the *NHS Devon Research Support Service, NHS Devon Primary Care Trust, 1<sup>st</sup> Floor (above St Leonard's Pharmacy), Athelstan Road, Exeter, EX1 1SB* for inclusion in our Research Governance file for your study.

**Research Governance**

I would like to take this opportunity to remind you of your responsibilities as an NHS researcher. These are:

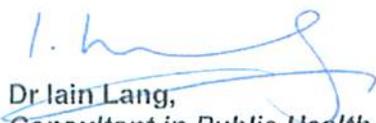
1. Work must be carried out in line with the new Research Governance Framework for Health and Social Services, which details the responsibilities for everyone involved in research
2. The Data Protection Act 1998 requires you to follow the eight principles of "good information handling"
3. You must be aware of, and comply with, Health and Safety standards in relation to your research.

More information about all these responsibilities can be found on the NHS Devon Research Support Service website at [www.swpctresearch.nhs.uk](http://www.swpctresearch.nhs.uk)

**If you have any queries relating to this study or letter of approval, please contact the NHS Devon Research Support Service at the address above or call 01392 267786.**

With best wishes for a successful study.

Yours sincerely



**Dr Iain Lang,**  
*Consultant in Public Health*  
Research Governance Lead, NHS Devon

cc. NHS Devon Research Support Service

**To: Alexandra Boyd**  
**From: Cris Burgess**  
**CC: Heather O'Mahen**  
**Re: Application 2010/013 to Ethics Committee –  
Effects of rumination on problem-solving, mood and confidence in post-natal  
depression**  
**Date: 26 April 2011**

The School of Psychology Ethics Committee met on 01/11/10 and your NHS Local Research Ethics Committee application and approval were reviewed. In line with our procedures, your project is now de facto approved.

The agreement of the Committee is subject to your compliance with the British Psychological Society Code of Conduct and the University of Exeter procedures for data protection (<http://www.ex.ac.uk/admin/academic/datapro/>). In any correspondence with the Ethics Committee about this application, please quote the reference number above.

I wish you every success with your research.

Yours sincerely,



Cris Burgess  
(Acting) Chair of School Ethics Committee



# National Research Ethics Service

## South West 2 Research Ethics Committee

Royal Devon & Exeter Hospital (Heavitree)  
Room TH5  
Gladstone Road  
Exeter  
Devon  
EX1 2ED

Telephone: 01392 405272

Fax: 01392 405270

Email: [Southwest.REC@nhs.net](mailto:Southwest.REC@nhs.net)

[www.nres.npsa.nhs.uk](http://www.nres.npsa.nhs.uk)

23 September 2010

Dr Heather O'Mahen  
Director of Research DClinPsy  
Mood Disorders Centre  
University of Exeter  
Washington Singer Building  
Exeter  
EX4 4QG

Dear Dr O'Mahen

**Study Title:** Effects of Rumination on Problem-Solving, Mood & Confidence in Post-natal Depression.

**REC reference number:** 10/H0206/33

Thank you for your letter of 07 September 2010, responding to the Committee's request for further information on the above research [and submitting revised documentation].

The further information has been considered on behalf of the Committee by the Chair.

### Confirmation of ethical opinion

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

### Ethical review of research sites

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

### Conditions of the favourable opinion

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

This Research Ethics Committee is an advisory committee to South West Strategic Health Authority

The National Research Ethics Service (NRES) represents the NRES Directorate within the National Patient Safety Agency and Research Ethics Committees in England

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

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

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

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

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

### Approved documents

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

Document	Version	Date
Investigator CV		01 May 2010
Protocol		10 March 2010
Check List	3.0	14 June 2010
Contact Sheet	3	17 August 2010
Consent Form	3	17 August 2010
Visual Analogue Scale for Parental Confidence		
Letter from Sponsor		17 May 2010
SCID Baseline Template Score Sheet		
Participant Information Resources Sheet	1	21 May 2010
Problem Solving Exercises	1	07 September 2010
REC application	2.5	17 May 2010
Covering Letter		01 June 2010
Covering Letter		17 August 2010
Letter of invitation to participant	1	21 May 2010
Participant Information Sheet	4	05 September 2010
Response to Request for Further Information		17 August 2010
Response to Request for Further Information		07 September 2010
Questionnaire: Edinburgh Postnatal Depression Scale		
Questionnaire: Beck Depression Inventory -II		
CV Alexandra Boyd		17 May 2010
Visual Analogue Scale for Mood		
Feedback form for literature review		
Letter to the GP informing them of their patients participation in the study	1	21 May 2010

## Statement of compliance

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

## After ethical review

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

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

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

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

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

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

10/H0206/33

Please quote this number on all correspondence

Yours sincerely



pp Mr Richard Ashby  
Chair

Email: [Southwest.REC@nhs.net](mailto:Southwest.REC@nhs.net)

Enclosures: "After ethical review – guidance for researchers" [SL-AR1 for CTIMPs, SL- AR2 for other studies]

Copy to: Ms Alexandra Boyd  
Dr. Michael Wykes

## **Appendix C: Extended Results**

Data was analysed using SPSS PAWS Statistics for Windows Vista. All data was double checked at time of entry to minimise data entry error.

### **Checking for normality**

In order to check the data for normality the following steps were undertaken, box plots were examined for each continuous variable. Before collapsing the measures of mood and confidence analyses for each measure were run to ensure that the data points were not significantly different from each other, results indicated that they did not differ significantly and as a result data was collapsed to one score for confidence and one for total mood (excluding pre and post experiment scores). Examination of histograms was then undertaken to visually examine if the data fitted the normal distribution (See figure 1, figure 2, figure 3, figure 4 and figure 5). Examination of the Kolmogorov-Smirnov statistic was then undertaken to assess if the assumptions of normality were fulfilled.

### **Histograms**

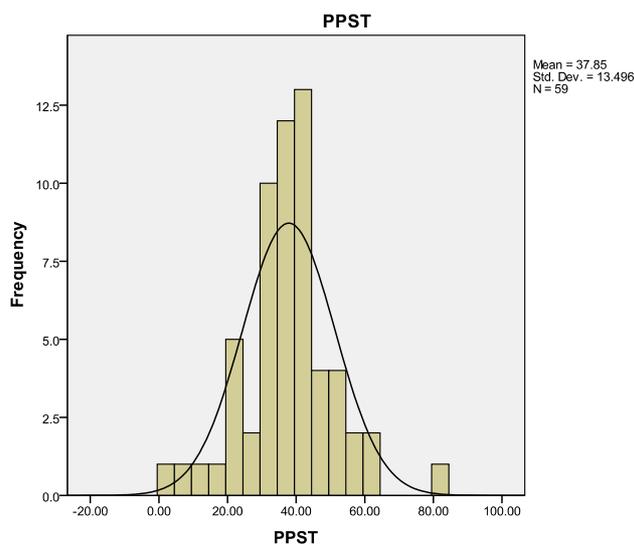


Figure 1. Histogram for problem-solving scores

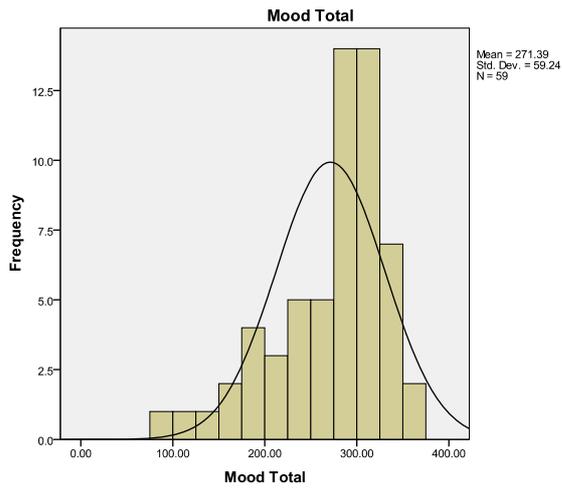


Figure 2. Histogram for overall mood scores

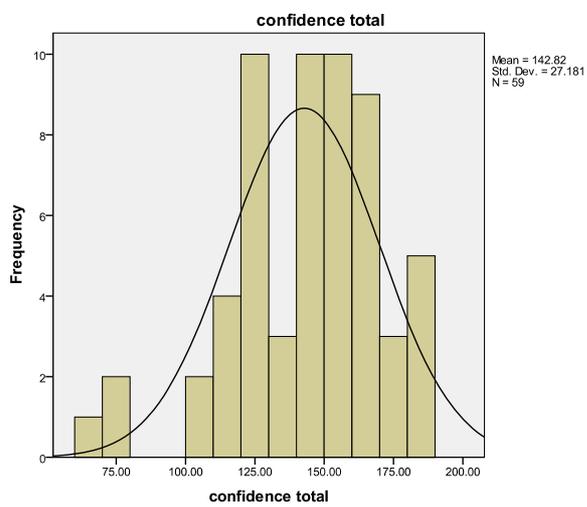


Figure 3. Histogram for confidence scores

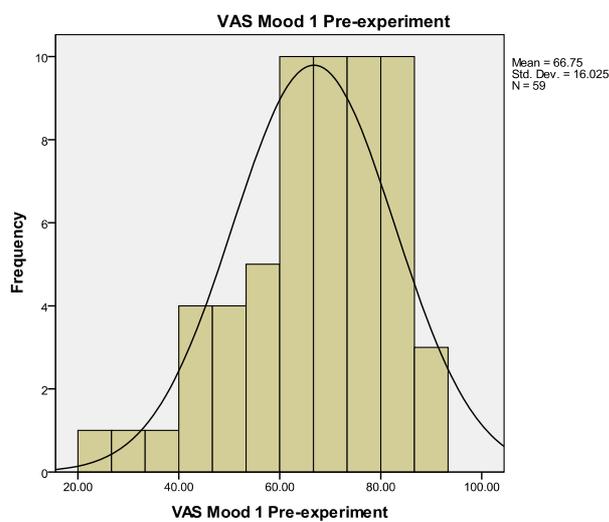


Figure 4. A histogram for baseline mood

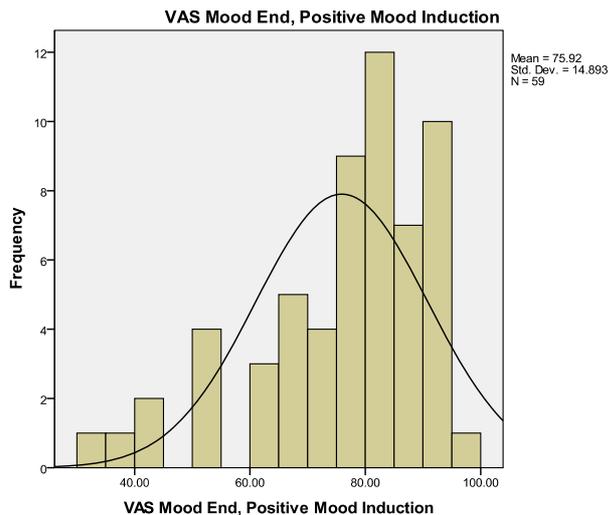


Figure 5. A histogram for mood post positive mood induction

### Kolmogorov-Smirnov Statistic

Examination of the Kolmogorov-Smirnov statistic was then undertaken to assess if the assumptions of normality were fulfilled (see table 1). The Kolmogorov-Smirnov test for PPST scores,  $D(59) = 0.10$ ,  $p = 0.18$  shows non-significance and that the results do not differ significantly from those expected within a normal population. The Kolmogorov-Smirnov test further indicated that confidence scores,  $D(59) = 0.10$ ,  $p = 0.08$  were non-significant and do not differ significantly from those expected within a normal population. However, the Kolmogorov-Smirnov test indicated that for the baseline mood,  $D(59) = 0.23$ ,  $p = 0.01$ . Total mood,  $D(59) = 0.18$ ,  $p < 0.001$  and mood following the positive mood induction,  $D(59) = 0.15$ ,  $p = 0.002$  the scores did differ significantly from a normal population.

Table 1. Results of the Kolmogorov-Smirnov test of normality.

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PPST	.104	59	.178	.971	59	.172
Confidence Total	.108	59	.083	.950	59	.016
Baseline Mood	.130	59	.015	.952	59	0.21
Mood Total	.175	59	.000	.920	59	.001
Positive Mood Induction	.149	59	.002	.895	59	.000

a. Lilliefors Significance Correction

As all three scores for mood did not meet normality assumptions, data was transformed. Transformations (log, square root and reciprocal) did not rectify these violations and, as a result non-parametric tests were used to assess mood.

### Demographic Information

In order to assess if the balance of demographic information may influenced the results Chi-squares and t-tests were conducted to assess any significant differences were present between conditions.

Chi-square results for marital status indicated that there were no significant differences,  $X^2(2) = 5.54, p = .06$ . Table 2 shows the results of Chi-square analysis.

Table 2 Chi-square analysis results for marital status.

<b>Chi-Square Tests</b>				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	5.574 <sup>a</sup>	2	.062	
Likelihood Ratio	6.138	2	.046	
Linear-by-Linear Association	1.567	1	.211	
N of Valid Cases	59			

a. 4 cells (66.7%) have expected count less than 5. The minimum expected count is 2.95.

Chi-square results for education level indicated that there were no significant differences,  $X^2(4) = 0.70$ ,  $p = 0.95$ . Table 3 shows the results of Chi-square analysis.

Table 3 Chi-square analysis results for education level Chi-Square Tests.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.698 <sup>a</sup>	4	.952
Likelihood Ratio	.710	4	.950
Linear-by-Linear Association	.112	1	.738
N of Valid Cases	59		

a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is 1.47.

Chi-square results for ethnicity indicated that there were no significant differences,  $X^2(4) = 4.98$ ,  $p = 0.29$ . Table 4 shows the results of Chi-square analysis.

Table 4 Chi-square analysis results for reported ethnicity.

<b>Chi-Square Tests</b>				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	4.984 <sup>a</sup>	4	.289	
Likelihood Ratio	6.915	4	.140	
Linear-by-Linear Association	.449	1	.503	
N of Valid Cases	59			

a. 8 cells (80.0%) have expected count less than 5. The minimum expected count is .49.

Chi-square results for differences regarding the presence of a baby during the experiment indicated that there were no significant differences,  $X^2(1) = .42$ ,  $p = 0.52$ . Table 5 shows the results of Chi-square analysis

Table 5 Chi-square analysis results for the presence of a baby during the experiment

<b>Chi-Square Tests</b>						
	Value	df	Asymp. (2-sided)	Sig. (2-sided)	Exact (2-sided)	Sig. (1- sided)
Pearson Chi-Square	.416 <sup>a</sup>	1	.519			
Continuity Correction <sup>b</sup>	.148	1	.701			
Likelihood Ratio	.417	1	.519			
Fisher's Exact Test					.606	.350
Linear-by-Linear Association	.409	1	.522			
N of Valid Cases	59					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.76.

b. Computed only for a 2x2 table

T-tests were run in order to assess if relationships were present between demographic variables measured by interval data and the experimental conditions. No significant difference was seen for household income,  $t(57) = 0.55$ ,  $p = 0.58$ . No differences were found for number of children living in the household,  $t(57) = 1.07$ ,  $p = 0.80$ . No differences were found for number of hours sleep in the last week  $t(57) = 0.38$ ,  $p = 0.84$ . No differences were found for the age of the baby  $t(57) = 0.001$ ,  $p = 0.49$ . Finally no significant differences were found for the age of the mother  $t(57) = 0.03$ ,  $p = 0.63$ . The results of the t-tests can be seen in table 6.

Table 6 Results of T-test carried out for demographic variables.

		Levene's Test for Equality of Variances		t-test for Equality of Means			95% Confidence Interval of the Difference			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Yearly Household Income	Equal variances assumed	.992	.323	.551	57	.584	4762.64368	8643.37636	-12545.41894	22070.70630
	Equal variances not assumed			.547	48.467	.587	4762.64368	8701.36588	-12728.26724	22253.55459
Number of Children	Equal variances assumed	1.069	.305	-.255	57	.800	-.05172	.20311	-.45844	.35499
	Equal variances not assumed			-.256	55.016	.799	-.05172	.20232	-.45719	.35374
Average Number of Hours Sleep	Equal variances assumed	.384	.538	.203	57	.840	.06667	.32789	-.58993	.72326
	Equal variances not assumed			.203	55.792	.840	.06667	.32853	-.59152	.72485
Age of Baby	Equal variances assumed	.001	.977	-.694	57	.491	-.6828	.9841	-2.6534	1.2879
	Equal variances not assumed			-.694	56.999	.490	-.6828	.9836	-2.6524	1.2869
Age	Equal variances assumed	.027	.870	.488	57	.627	.5471	1.1212	-1.6979	2.7922
	Equal variances not assumed			.489	56.961	.627	.5471	1.1200	-1.6956	2.7899

## SPSS Output for the Main Analysis

Table 7. Results of the Mann Whitney U analysis for baseline mood.

<b>Test Statistics<sup>a</sup></b>	
	VAS Mood 1 Pre- experiment
Mann-Whitney U	175.000
Wilcoxon W	385.000
Z	-3.444
Asymp. Sig. (2-tailed)	.001
Exact Sig. (2-tailed)	.000
Exact Sig. (1-tailed)	.000
Point Probability	.000

a. Grouping Variable: Group

Table 8. Results of the Mann Whitney U analysis for mood following rumination and distraction induction

<b>Test Statistics</b>		
Group		Mood Post Induction
Control Group	Mann-Whitney U	177.000
	Wilcoxon W	367.000
	Z	-.365
	Asymp. Sig. (2-tailed)	.715
	Exact Sig. [2*(1-tailed Sig.)]	.728 <sup>a</sup>
	Exact Sig. (2-tailed)	.723
	Exact Sig. (1-tailed)	.362
	Point Probability	.005
Dysphoric Group	Mann-Whitney U	45.000
	Wilcoxon W	100.000
	Z	-.378
	Asymp. Sig. (2-tailed)	.705
	Exact Sig. [2*(1-tailed Sig.)]	.739 <sup>a</sup>
	Exact Sig. (2-tailed)	.739
	Exact Sig. (1-tailed)	.370
	Point Probability	.028

a. Not corrected for ties.

b. Grouping Variable: Condition

Table 9. Results of planned contrast run to assess dysphoric ruminators' problem solving effectiveness in comparison to the dysphoric distraction group and the control group.

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	1095.164	1	1095.164	6.624	.013
Error	9092.750	55	165.323		

Table 10. Post-hoc test for problem solving effectiveness

**Multiple Comparisons**

PPST

Bonferroni

(I) Dummy	(J) Dummy	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control Rumination	Control Distraction	-4.7500	4.11914	1.000	-16.0243	6.5243
	Dyphoric Rumination	10.1000	5.02329	.296	-3.6490	23.8490
	Dysphoric Distraction	.3000	5.02329	1.000	-13.4490	14.0490
Control Distraction	Control Rumination	4.7500	4.11914	1.000	-6.5243	16.0243
	Dyphoric Rumination	14.8500*	4.97980	.026	1.2201	28.4799
	Dysphoric Distraction	5.0500	4.97980	1.000	-8.5799	18.6799
Dyphoric Rumination	Control Rumination	-10.1000	5.02329	.296	-23.8490	3.6490
	Control Distraction	-14.8500*	4.97980	.026	-28.4799	-1.2201
	Dysphoric Distraction	-9.8000	5.75018	.564	-25.5385	5.9385
Dysphoric Distraction	Control Rumination	-.3000	5.02329	1.000	-14.0490	13.4490
	Control Distraction	-5.0500	4.97980	1.000	-18.6799	8.5799
	Dyphoric Rumination	9.8000	5.75018	.564	-5.9385	25.5385

Based on observed means.

The error term is Mean Square(Error) = 165.323.

\*. The mean difference is significant at the .05 level.

Table 11. Results of the planned contrast run to assess dysphoric ruminators' confidence in comparison to the dysphoric distraction group and the control group.

**Test Results**

Dependent Variable: Confidence total

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	1298.373	1	1298.373	2.117	.151
Error	33726.859	55	613.216		

a. Computed using alpha = .05

Table 12. Post-hoc tests for confidence.

**Multiple Comparisons**

Confidence Total

Bonferroni

(I) Dummy	(J) Dummy	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Control Rumination	Control Distraction	-7.1132	7.93318	1.000	-28.8266	14.6003
	Dyphoric Rumination	18.4868	9.67451	.367	-7.9927	44.9664
	Dysphoric Distraction	24.7368	9.67451	.080	-1.7427	51.2164
Control Distraction	Control Rumination	7.1132	7.93318	1.000	-14.6003	28.8266
	Dyphoric Rumination	25.6000	9.59074	.060	-.6503	51.8503
	Dysphoric Distraction	31.8500*	9.59074	.010	5.5997	58.1003
Dyphoric Rumination	Control Rumination	-18.4868	9.67451	.367	-44.9664	7.9927
	Control Distraction	-25.6000	9.59074	.060	-51.8503	.6503
	Dysphoric Distraction	6.2500	11.07444	1.000	-24.0612	36.5612
Dysphoric Distraction	Control Rumination	-24.7368	9.67451	.080	-51.2164	1.7427
	Control Distraction	-31.8500*	9.59074	.010	-58.1003	-5.5997
	Dyphoric Rumination	-6.2500	11.07444	1.000	-36.5612	24.0612

Based on observed means.

The error term is Mean Square(Error) = 613.216.

\*. The mean difference is significant at the 0.05 level.

Table 13. Results of the Mann Whitney U analysis to assess dysphoric ruminators' overall mood

<b>Test Statistics<sup>a</sup></b>	
	Mood Total
Mann-Whitney U	167.500
Wilcoxon W	377.500
Z	-3.563
Asymp. Sig. (2-tailed)	.000
Exact Sig. (2-tailed)	.000
Exact Sig. (1-tailed)	.000
Point Probability	.000

a. Grouping Variable: Group

Table 14. Results of the Mann Whitney U analysis to assess differences between dysphoric distracters and control distracters.

<b>Test Statistics<sup>b</sup></b>	
	Mood Total
Mann-Whitney U	53.000
Wilcoxon W	108.000
Z	-2.068
Asymp. Sig. (2-tailed)	.039
Exact Sig. [2*(1-tailed Sig.)]	.039 <sup>a</sup>

a. Not corrected for ties.

b. Grouping Variable: Group

Table 15. Results of the Mann Whitney U analysis to assess differences between dysphoric distracters and control ruminators.

<b>Test Statistics<sup>b</sup></b>	
	Mood Total
Mann-Whitney U	57.500
Wilcoxon W	112.500
Z	-1.721
Asymp. Sig. (2-tailed)	.085
Exact Sig. [2*(1-tailed Sig.)]	.085 <sup>a</sup>

a. Not corrected for ties.

b. Grouping Variable: Group

### Parametric equivalent analyses for mood

In order to consider the arguments that ANOVAs are robust enough to account for deviations from normality (Glass, Peckham & Saunders 1972; Field, 2009) further parametric analyses were undertaken as a comparison. Results a planned contrast supported the prediction that dysphoric ruminators showed lower mood than the other three groups,  $F(1,55)=7.17$ ,  $p=0.01$ . Post-hoc comparisons further revealed that dysphoric distracters reported significantly lower mood than the control distracters,  $F(3,55)=6.67$ ,  $p=0.02$  and the control ruminators,  $F(3,55)=6.67$ ,  $p=0.05$ .

Table 16. Results of the planned contrast run to assess dysphoric ruminators mood.

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	19457.578	1	19457.578	7.169	.010
Error	149278.537	55	2714.155		

Table 17. Post-hoc tests for mood.

**Multiple Comparisons**

Mood Total

Bonferroni

(I) Group	(J) Group	Mean		Sig.	95% Confidence Interval	
		Difference (I-J)	Std. Error		Lower Bound	Upper Bound
Control Rumination	Control Distraction	-6.7263	16.69006	1.000	-52.4077	38.9551
	Dyphoric Rumination	64.9737*	20.35352	.014	9.2652	120.6822
	Dysphoric Distraction	55.1737	20.35352	.054	-.5348	110.8822
Control Distraction	Control Rumination	6.7263	16.69006	1.000	-38.9551	52.4077
	Dyphoric Rumination	71.7000*	20.17730	.005	16.4738	126.9262
	Dysphoric Distraction	61.9000*	20.17730	.020	6.6738	117.1262
	Control Rumination	-64.9737*	20.35352	.014	-120.6822	-9.2652
Dyphoric Rumination	Control Distraction	-71.7000*	20.17730	.005	-126.9262	-16.4738
	Dysphoric Distraction	-9.8000	23.29873	1.000	-73.5697	53.9697
	Control Rumination	9.8000	23.29873	1.000	-53.9697	73.5697
Dysphoric Distraction	Control Rumination	-55.1737	20.35352	.054	-110.8822	.5348
	Control Distraction	-61.9000*	20.17730	.020	-117.1262	-6.6738
	Dyphoric Rumination	9.8000	23.29873	1.000	-53.9697	73.5697
	Control Rumination	9.8000	23.29873	1.000	-53.9697	73.5697

Based on observed means.

The error term is Mean Square(Error) = 2714.155.

\*. The mean difference is significant at the 0.05 level.

**References**

Field, A. (2009). *Discovering Statistics Using SPSS*. London: Sage.

Glass, G. V., Peckham, P. D., & Sanders, J. R. (1972). Consequences of failure to meet the assumptions underlying the fixed effects analyses of variance and covariance. *Review of Educational Research*, 42, 237-288.

## Appendix D: Dissemination Strategy

To ensure that the research findings are disseminated to all parties who have been involved in the research a number of steps shall be followed. These are outlined in table 1.

Table 1. Outline of the dissemination of research findings.

<b>Target Group</b>	<b>Method</b>
1. Participants	All participants who took part in the research will be sent a letter explaining the results of the study.
2. Health Visitors & Perinatal Mental Health Professionals	A brief summary of the findings will be sent to Team Managers for dissemination. An offer to present findings was made throughout the recruitment process and where teams requested more formal feedback findings will be presented at team meetings.
3. GP Practices	A summary of the findings will be sent to all GP practices involved in recruitment. An offer will be made to present findings more formally where GPs are interested.
4. Wider academic & clinical community	As the findings of the research are applicable to the wider academic and clinical community it is hoped that a paper will be submitted to the journal 'Behaviour Research and Therapy'.



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