

ABSTRACT

Title of Document: THE EFFECTS OF POSITIVE EXPRESSIVE WRITING ON POSTPARTUM WELLBEING: A COMPARISON OF MINDFULNESS AND SELF-AFFIRMATION.

Sara Kate Ericson, Doctor of Philosophy, 2015

Directed By: Professor Mary Ann Hoffman, Department of Counseling, Higher Education, and Special Education

Research on women during the postpartum period has focused primarily on depression, to the exclusion of other aspects of wellbeing and distress. Though research has also described the barriers to getting help with experiences of postpartum emotional distress there is little research on easily accessible and affordable prevention and treatment interventions or consideration of how women's individual differences may influence the effectiveness of interventions intended to prevent and treat symptoms of emotional distress. In the present study, self-report data was gathered from 257 women at five points in time during the extended postpartum period. Baseline measures of anxiety, depression, wellbeing, and two facets of mindfulness (nonreactivity and nonjudgment of inner experiences) were examined as potential predictors of how two types of positive expressive writing interventions, based on self-affirmation and mindfulness theories, would impact women's

symptoms of depression, anxiety, and complaints related to physical and psychological wellbeing. These conditions were also compared to a waitlist control condition. Contrary to what was hypothesized, there were no significant differences between the writing and waitlist conditions on outcome anxiety, depression, or wellbeing. Additionally, nonjudgment and nonreactivity did not interact with type of writing condition in predicted ways. Compared to the self-affirmation condition, those in the mindfulness condition used more emotion words in their writings, and reported more changes in affect over the course of their individual writing sessions. Post-hoc analyses indicated post-writing negative affect might mediate the relationship between baseline and follow-up depression and anxiety. Limitations and implications of the findings are discussed along with recommendations for future study.

THE EFFECTS OF POSITIVE EXPRESSIVE WRITING ON POSTPARTUM
WELLBEING: A COMPARISON OF MINDFULNESS AND SELF-
AFFIRMATION.

by

Sara Kate Ericson

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Advisory Committee:
Professor Mary Ann Hoffman, Chair
Associate Professor Emeritus, Bill Strein
Associate Professor Matthew J. Miller
Professor Charles Gelso
Associate Professor David Yager

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Dedication

First to my son Finn, whose arrival brought me so much joy and so much anxiety, and my second son who is yet to be named, for giving me a deadline even I couldn't push back. To Erich, who always thinks I'm great and smart even when I feel like a failure, and always challenges me to think bigger and try harder. To Leah, for always being satisfyingly incredulous that I had more work to do. To my sister Audrey, both for supporting me and for providing hours upon hours of excitement for Finn while I worked. To my mom, whose fault it is that I ever got it into my head that someday I would get a PhD

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Table of Contents

Dedication	ii
Acknowledgements	iii
Table of Contents	iv
List of Tables	vi
List of Figures	vii
Chapter 1: Introduction	1
Chapter 2: Literature Review	6
Postpartum Wellbeing	7
Expressive Writing	19
Self-Affirmation	28
Mindfulness	31
Chapter 3: Statement of the Problem	38
Hypotheses and Research Questions	40
Chapter 4: Method	49
Power Considerations	49
Participants	49
Measures	52
Procedure	60
Chapter 5: Results	65
Expectations of Improvement	67
Manipulation Checks	72
Tests of Hypotheses	72
Additional Analyses	112
Summary of Results	127
Chapter 6: Discussion	129
Study Findings	132
Differences between Treatment and Waitlist	138
Limitations and Future Directions	143
Conclusion	147
Appendix A - Recruitment Notice	150
Appendix B – Consent Form	151
Appendix C - Eligibility Criteria	155
Appendix D - Demographics	156
Appendix E - Mother’s Postnatal Health Instrument	158
Appendix F - Penn State Worry Questionnaire	162
Appendix G - Five-Facet Mindfulness Questionnaire	164
Appendix H - Edinburgh Postnatal Depression Scale	169
Appendix I - Initial Email for Writing Conditions	170
Appendix J - Initial Email for Waitlist Condition	171
Appendix K - Expectation of Improvement for Treatment Conditions	172
Appendix L - Expectation of Improvement for Waitlist Control Condition	173
Appendix M Positive and Negative Affect Schedule – Short Form	175
Appendix N - Mindfulness Interventions - Day 1	176
Appendix O - Manipulation Check – Mindfulness Condition	179

Appendix P - Self-Affirmation Writing Condition and Sources of Validation Scale	180
Appendix Q - Manipulation Check – Self-Affirmation Condition	181
Appendix R - Reminder Check-in Email	182
Appendix S - Final Reminder Email	183
Appendix T - Weekly Check-in Email – writing conditions	184
Appendix U - Weekly Check-in Email – waitlist	185
Appendix V - Email for Follow-up Survey – Writing Conditions	186
Appendix W - Email for Follow-up Survey – Waitlist Condition	187
Appendix X - Survey of professional assistance you received	188
Appendix Y - Option to Participate for Waitlist Control	189
Appendix Z - Debriefing Form	190
Appendix A1 - Directions and Links for Waitlist Control	192
References	193

List of Tables

Table 1: Correlations Between all Variables of Interest.....	69
Table 2. Means, Standard Deviations, Obtained and Possible Ranges and Reliability for all Variables of Interest	70
Table 3. Means and Standard Deviations by Condition for all Variables of Interest. .	71
Table 4. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Depression Scores from Baseline Depression, Baseline Nonreactivity, and Type of Writing Condition.....	81
Table 5. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Anxiety Scores from Baseline Anxiety, Baseline Nonreactivity, and Type of Writing Condition.....	85
Table 6. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Postpartum Wellbeing Scores from Baseline Postpartum Wellbeing, Baseline Nonreactivity, and Type of Writing Condition	89
Table 7. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Depression Scores from Baseline Depression, Baseline Nonjudgment, and Type of Writing Condition.....	93
Table 8. Summary of ANCOVA Predicting Outcome Anxiety Scores from Baseline Nonjudgment, and Type of Writing Condition, Controlling for the Effect of Baseline Anxiety.....	96
Table 9. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Postpartum Wellbeing Scores from Baseline Wellbeing Scores, Baseline Nonjudgment, and Type of Writing Condition	100
Table 10. Summary of Slopes Analyses for Outcome MPH-I Score, Based on Low, Medium, and High Scores of Baseline Postnatal Wellbeing Complaints and Nonjudgment.....	101
Table 11. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Gain Scores from Baseline Mindfulness and Type of Writing Condition.	105
Table 12. Means, Standard Deviations and Paired t-tests for Measures of Affect Before and After Individual Writing Sessions.....	108
Table 13. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Depression Scores from Baseline Depression and Type of Condition.....	115
Table 14. Summary of ANCOVA Predicting Outcome Anxiety Scores from Writing Condition, Controlling for the Effect of Baseline Anxiety.....	118
Table 15. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Postpartum Health Complaints from Baseline Complaints and Condition.....	120
Table 16. Means and Standard Deviations for Anxiety, Depression, and Wellbeing at Varying Weeks after Childbirth.....	126

List of Figures

Figure 1: Hypothesized interaction between baseline nonjudgment and condition predicting score on outcome variables depression, anxiety, and complaints related to wellbeing.....	46
Figure 2: Hypothesized interaction between baseline nonreactivity and condition predicting score on outcome variables of depression, anxiety, and complaints related to wellbeing.....	47
Figure 3: Overview of Procedure.....	64
Figure 4. Number of participants at each stage of study.....	68
Figure 5. Interaction effect between baseline anxiety (measured by PSWQ) and condition on follow-up anxiety.....	77
Figure 6. Interaction effect between baseline depression (measured by EPDS) and condition on follow-up depression score.....	82
Figure 7. Interaction effect between baseline depression (measured by PSWQ) and condition on follow-up anxiety score.....	86
Figure 8. Interaction effect between baseline wellbeing, baseline nonreactivity, and condition on follow-up postpartum wellbeing.....	90
Figure 9. Interaction effect between baseline depression as measured by the EPDS, baseline nonjudgment, and type of writing condition on follow-up postpartum depression scores.....	94
Figure 10. Estimated marginal means at low and high levels of baseline nonjudgment at mean (47.56) anxiety levels.....	97
Figure 11. Interaction effect between baseline wellbeing as measured by the MPH-I, baseline nonjudgment, and type of writing condition on follow-up postpartum wellbeing scores.....	102
Figure 12. Interaction effect between baseline mindfulness as measured by the FFMQ and type of writing condition on mindfulness change scores between baseline and follow-up.....	106
Figure 13. Interaction effect between timepoint and condition on level of negative affect.....	110
Figure 14. Interaction effect between timepoint and condition on level of positive affect.....	112
Figure 15. Interaction effect between baseline depression and writing condition on follow-up depression.....	116
Figure 16. Interaction effect between baseline wellbeing and writing condition on follow-up wellbeing.....	121

Chapter 1: Introduction

The transition to motherhood is a complex and multifaceted process, and each woman has a unique experience. Nonetheless, a large majority of women experience some physical symptoms or emotional distress in the months following giving birth (Declercq, Sakala, Corry, & Applebaum, 2009; Munk-Olson, Munk Larsen, Pedersen, Mors, & Mortensen, 2006). Depending on severity these symptoms can negatively impact women's current and future wellbeing, their relationships, and their parenting (Declercq et al., 2009; Wisner, Chambers, & Sit, 2006). Some researchers have found differences in the patterns of health and wellbeing between new and experienced postpartum mothers (Thompson, Roberts, Currie, & Ellwood, 2002) such as increased risk of mental disorders for new mothers (Munk-Olson et al., 2006). Theoretically it makes sense that having one's first child may be very different from having an additional child, and therefore the present study focused on first-time mothers.

Research on the transition to motherhood is abundant in some areas, but incomplete as a whole. Within the medical literature, the postpartum period is given a relatively low priority compared to other stages of maternity care (Albers, 2000), and psychological research has focused primarily on postpartum depression and symptoms of psychopathology, depicting a narrow view of the emotional state of new mothers (Hoffenaar, van Balen, & Hermanns, 2010).

Although research has shown that women in the postpartum period can benefit from psychotherapy (Stuart, O'Hara, & Gorman, 2003), women face significant instrumental and emotional barriers when seeking professional help such as lack of

time, lack of childcare, fear of stigma and even having their child taken away (Maloni, Przeworski, & Damato, 2013). Because of this there has been a call to develop accessible and affordable treatments for women during the transition to parenthood (Engle, 2009). Expressive writing, an intervention that can be administered over the internet, and at low to no cost, has empirical support in preventing and reducing physical and emotional symptoms in a number of populations (Baikie, Geerligs, & Wilhelm, 2012; James W Pennebaker et al., 1988, Frattaroli, 2006); but has remained untested with women in the postpartum period until now.

Traditional expressive writing interventions have been associated with a short-term increase in negative affect despite long-term benefits (M. E. Gillis, Lumley, Mosley-Williams, Leisen, & Roehrs, 2006), which may be unnecessarily risky for postpartum women who are vulnerable to postpartum distress. However, recent examinations of *positive* writing interventions, for example studies in which participants are asked to approach their writing with self-compassion or to consider the positive aspects of traumatic experiences, have found similar benefits without the short-term increase in negative affect (Burton & King, 2004; King & Miner, 2000). Thus, positive writing interventions may be more appropriate for new mothers.

Research has shown that women entering parenthood tend to be highly self-critical (Fleming, Flett, Ruble, & Wagner, 1990), and self-criticism in first time mothers is linked with depression and negatively associated with perceptions of social support (Priel & Besser, 2000). Two constructs that address patterns of self-criticism and have been studied as possible mechanisms through which expressive writing

works are mindfulness and self-affirmation (Creswell et al., 2007). The two writing interventions tested in the present study were based on these two constructs.

Mindfulness involves acceptance of inner experiences such as difficult thoughts and feelings and thus is thought to increase cognitive flexibility and reduce unwanted thought patterns such as rumination and self-criticism (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Researchers have begun to explore mindfulness interventions with women before and after giving birth, and have been associated not only with increases in mindfulness but in positive affect as well as decreases in depression (Duncan & Bardacke, 2010).

Self-affirmation interventions address negative thought patterns like self-criticism in a different way. Self-affirmation theory holds that when a person's sense of self is threatened by failure or challenge to one of the valued aspects of the self, reminders of one's values and identity can protect self-worth (Sherman & Cohen, 2006). Writing about valued aspects of the self has been associated with decreased stress and increased well-being (Creswell et al., 2007) as well as intentions of reducing self-criticism (Bucchianeri & Corning, 2012). However, the present study is the first expressive writing study with directions specifically related to self-affirmation, and the first to have tested a self-affirmation intervention with postpartum women.

The first purpose of this study was to compare the effectiveness of these two interventions with a wait-list control group to explore expressive writing as a brief and easily accessible method of improving postpartum wellbeing and decreasing symptomatology in first-time mothers. The second purpose of this study was to

compare the effectiveness of the self-affirmation and mindfulness writing against each other to see if one intervention is more effective than the other at improving wellbeing in postpartum women.

Researchers have called for studies to address not only the effectiveness of writing interventions but also when and with whom it is most effective (Pennebaker, 2004). As a response to this call, the third purpose of the present study was to explore potential moderators of the mindfulness writing condition, in which participants are asked to accept their difficult thoughts and experiences. All participants in this study will filled out baseline measures, including the five-facet mindfulness questionnaire (FFMQ; Baer, Walsh, & Lykins, 2008). This measure assessed overall trait mindfulness as well as five separate facets; observing, describing, acting with awareness, nonjudgment of inner experience and nonreactivity to inner experience. These last two facets of mindfulness, nonjudgment of inner experience and nonreactivity to inner experience, may especially impact the ability of participants to benefit from the intervention. Someone who has a natural tendency to be more accepting of her thoughts and feelings without judging or reacting to them may be better able to fully participate in the mindfulness condition than someone without this tendency. Conversely, the self-affirmation intervention may work better for new mothers who struggle with acceptance of their thoughts and experiences, since participants in the self-affirmation condition will instead be asked only to focus on their values and identity. Thus, I expected that those who had low levels of these two facets of mindfulness would benefit less from the mindfulness intervention than those with higher levels. I did not expect this difference to appear in the self-affirmation

condition. Finally, the current study adds to the literature, increasing knowledge about the health and wellbeing of women transitioning to parenthood.

Chapter 2: Literature Review

The World Health Organization defines maternal mental health as “a state of well-being in which a mother realizes her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her community” (Herrman et al., 2006). This inclusive definition describes more than just a lack of mental illness; it describes the ability to fully engage in life, and the capability to respond to one’s own needs and the needs of one’s child. Nonetheless, literature on the postpartum period has generally focused on psychopathology, and to a lesser extent physical symptoms (Hoffenaar et al., 2010). This may be partly because although the postpartum experience varies widely, significant numbers of women entering parenthood do experience some psychological distress. For example, authors of a 2008 study surveyed a large representative sample of first-time mothers in England who were approximately one month postpartum and found that almost half of the sample reported significant distress (McConachie et al., 2008). Ironically, despite this focus on symptoms there has been significantly less work on developing simple and accessible interventions to improve maternal health (Engle, 2009).

The following literature review contains three sections. The first section will review research related to postpartum women’s wellbeing. Because many studies include both first-time and experienced mothers, the research reviewed here will include research on postpartum health in all women. This section will also discuss the trajectories of postpartum health and the impact mothers’ postpartum health has on parenting. The second section will review the research on prevention and treatment

interventions, and introduce expressive writing as a possible method of interventions for new mothers. The third section will review research related to mindfulness and self-affirmation and propose two writing interventions based on these constructs intended to benefit first-time mothers, and introduce two components of trait mindfulness as possible moderators of the mindfulness writing intervention.

Postpartum Wellbeing

Emotional Wellbeing. New mothers have specific tasks that differ from experienced mothers that can make the postpartum period especially challenging, including dealing with the role shift from nonparent to parent and learning how to care for an infant while recovering from childbirth (Leahy-Warren, McCarthy, & Corcoran, 2012). However, this transition to motherhood is accompanied by complicated emotions and cannot be summarized as a wholly negative or positive experience. For example, researchers looking at women's affect throughout pregnancy and the postpartum period have found that new mothers experienced peak levels of both positive and negative affect ten days after giving birth (Wilkinson, 1999).

There is a plethora of research on some aspects of the experiences of new mothers, but there are a number of weaknesses in the literature that researchers have only recently begun to address. In the past researchers have often used varying and unclear definitions of the postpartum period, making comparisons more complicated. Authors have recently begun using more consistent definitions, with immediate postpartum defined as the first 48 hours after delivery, early postpartum defined as between 48 hours and 6 weeks, and extended postpartum between 6 weeks and one

year after delivery (Ramarao, Clark, Merkatz, Sussman, & Sitruk-Ware, 2013). The present study focused on the extended postpartum period.

It may seem that any emotional or physical symptoms would dissipate by one year after childbirth, but research indicates that this is not the case. A longitudinal study of first-time mothers found that depression scores were at their highest at 2 months, but showed no significant change between 3 and 12 months (Beeghly et al., 2002). Another study looking at pre and postnatal depression and anxiety in a community sample of mothers found that individual differences in symptoms of anxiety were stable from early pregnancy to 8 months postpartum (Heron, O'Connor, Evans, Golding, & Glover, 2004). While physical complaints lessen somewhat over the first year, certain physical problems such as hemorrhoids, dizziness, fatigue, and constipation persist, and other problems such as respiratory problems, sexual problems, and hair loss, are more likely to appear after the early postpartum period (Gjerdingen & Center, 2003).

In addition to the lack of clarity and consistency in definition, much of the research on postpartum women has focused solely on negative affect despite the fact that postpartum wellbeing is a complicated experience (Hoffenaar et al., 2010). This focus presents a black and white view of wellness focused on the presence or absence of psychological disorders and authors tend to report the percentages of women who exceed a certain threshold on psychological measures rather than mean scores (Dipietro, Costigan, & Sipsma, 2008). Additionally, the presence of disorders is often ascertained using only one method of measurement (Dipietro et al., 2008). Many postpartum mothers experiencing problematic symptoms do not meet the criteria for

clinical diagnoses of disorders, leading more recent researchers to question the utility of these diagnoses (Reck et al., 2008).

Although many recent studies often still focus on symptoms of psychological disorders, authors have begun to consider additional aspects of wellbeing. For example, in a recent national survey women answered questions related to emotional and physical distress, but also to other aspects of their lives as well such as their ability to participate in activities that maintain their wellness (Declercq et al., 2009). They found that at six months postpartum, almost half of the women reported they were not getting enough exercise, 22% reported not getting enough sleep, 23% reported they were not eating a healthy diet, and 14% reported they were not managing their stress well. The participants were also given a list of physical and emotional health problems and asked to designate any new problems. Approximately 25% of the sample was experiencing stress as a minor or major problem at two months postpartum and continued to report this problem at six months. The results of this study also show that women may underreport their emotional symptoms. For instance, whereas only 6% of women endorsed depression as a minor or major postpartum-onset symptom at 6 months after delivery, approximately two thirds (67%) of women between 4 and 6 months postpartum scored above the cutoff point on a screening scale intended to assess minor or major depressive symptoms (Declercq et al., 2009). Other psychological symptoms seen in postpartum women include posttraumatic stress (Maggioni, Margola, & Filippi, 2006) and anxiety (Reck et al., 2008).

The transition to motherhood is not a uniform experience. For example, in a recent large study in which approximately 29% of mothers screened positively for anxiety symptoms between two and three months after delivery, scores of depression and anxiety were only moderately correlated ($r=.53$), with very few women screening positively for both types of symptoms (Paul, Downs, Schaefer, Beiler, & Weisman, 2013). Other studies looking at the transition from pregnancy to the postpartum period have found that women have reported either increased depression but not anxiety, (Dipietro et al., 2008), or increased anxiety but not depression (Eberhard-Gran, Tambs, Opjordsmoen, Skrondal, & Eskild, 2003). Authors of a recent study that measured multiple aspects of pre and postpartum health found variability in postpartum scores of wellbeing was significantly greater than it was in pregnancy and noted that this may indicate that becoming a mother may increase the importance of individual differences (Hoffenaar et al., 2010).

Differences found to be important in determining postpartum health include lower self-esteem, a history of premenstrual symptoms, previous diagnoses of bipolar disorder or depression, family psychiatric history and infant temperament, childcare stress, less social support, and having an unplanned or unwanted pregnancy (Beck, 2001; Grussu, Quatraro, & Nasta, 2005; Suri, 2012). However, some differences in the ways women react to becoming a parent can be concealed by the tendency of researchers to focus only on group averages (Hoffenaar et al., 2010), and biases in the research (such as those toward women with higher education and income). For example, income was relatively recently thought to be only a minor risk factor for developing postpartum depression, but newer studies with a wider range of incomes

in the sample have found poverty to be a major risk factor (Segre, O'Hara, Arndt, & Stuart, 2007; Suri, 2012).

Marital Satisfaction. There is a large body of research related to the impact of having a child on marital satisfaction. Authors of a 2003 meta-analysis of 148 studies found a small but significant negative association between parenthood and marital satisfaction (Twenge, Campbell, & Foster, 2003). While this affects both men and women for much longer than the postpartum period, the same meta-analysis found that this drop in satisfaction was most pronounced for parents of infants (Twenge et al., 2003). Hence, romantic relationships are another area that can impact (and be impacted by) women's wellbeing in the postpartum period.

In a longitudinal study that gives insight to the changes in postpartum women's romantic partnerships, researchers interviewed new mothers about the way they felt about their partners, their infants, and themselves at timepoints between mid-pregnancy and 16 months postpartum. The number of women's positive and negative statements about their partner started out approximately equal during pregnancy and decreased rapidly to two negative statements for every one positive statement at three months, starting to increase again at 16 months postpartum (Fleming et al., 1990).

Interestingly, in this same study women were found to be relatively self-critical throughout the transition to parenthood. Across timepoints, with little variation, women said an average of less than one positive statement for every two negative statements about themselves. This pattern of self-criticism could be helpful for researchers to consider when developing interventions, as issues relating to the self were found to be a primary component of the participants' negative mood

(Fleming et al., 1990). Exemplifying the combination of both positive and negative emotions commonly experienced during the postpartum period, participants' positive statements about their child steadily increased from birth to 16 months, from about equal to two positive statements for every one negative statement.

Physical Wellbeing. Physical symptoms following childbirth are understudied despite the fact that they are common and can get in the way of daily functioning (Webb et al., 2008). Authors of a review of the research on postpartum physical health found that variation in symptoms measured, unclear and varying definitions of the terms postpartum and physical health, and the lack of established standard scales for measuring physical health in postpartum women make it difficult to gain a coherent understanding of the postpartum mothers' health (Cheng & Li, 2008). Despite these difficulties, this review found that backaches, tiredness, headaches, lack of sexual desire, sexual problems, and sleep disorders were the most common symptoms to persist beyond the immediate postpartum period (Cheng & Li, 2008). Findings from a recent large national survey were consistent with these results, as a significant portion of women reported urinary problems, exhaustion, headaches, and sleep problems through six months (Declercq et al., 2009).

Studies have also found significant associations between physical and emotional symptoms (Brown & Lumley, 2000; Chien, Tai, Hwang, & Huang, 2009). For example, authors of a study of low-income postpartum women found that 45% of the sample reported experiencing a physical problem of moderate or major severity, and that this was correlated with a significantly higher score on a measure of depression than women with no physical symptoms (Webb et al., 2008). Physical

changes associated with pregnancy and birth also impact body image for many postpartum women. For example, a longitudinal study of women during pregnancy and the postpartum period found that in the first year following giving birth, women reported feeling fatter, less strong, and less fit, and felt further away from their ideal size, reporting the most body concerns at six months postpartum (Rallis, Skouteris, Wertheim, & Paxton, 2007)

Trajectory of postpartum wellbeing. It makes intuitive sense that postpartum wellbeing would steadily improve after giving birth, but the patterns appear to be more complex. Research on the trajectory of postpartum health has the same limitations as research on postpartum health in general, including various outcome measures and timepoints, but indicates that women may experience some emotional and physical health problems beyond the immediate postpartum period. Authors of an integrative review on women's general health have recommended that experts should reconsider the traditional assumption that women recover from pregnancy, labor and delivery within the widely recognized recovery period of six weeks (Cheng & Li, 2008).

Postpartum emotional symptoms may also linger beyond the first weeks and months following childbirth. Authors of a longitudinal study looked at the patterns of maternal stress, anxiety and depression in the two years following giving birth (Dipietro et al., 2008). They found that women who were particularly low or high on a composite measure of these symptoms at six weeks were likely to score similarly at two years. New mothers reported a steady increase in distress in the two years that followed giving birth, whereas experienced mothers reported the opposite pattern

(Dipietro et al., 2008). The authors speculated that this may be because women with children knew more about what to expect regarding the demands of childbirth and childcare, making it more stressful beforehand (during pregnancy) but less stressful afterward (postpartum) (Dipietro et al., 2008).

A longitudinal study in which authors examined the pattern of new mothers' self reported distress and depression symptoms found five primary trajectories of mothers' mental health through pregnancy and the immediate, early, and late postpartum periods (Vänskä et al., 2011). The majority of the sample (75%) experienced low levels of mental health symptoms. Approximately 9% experienced higher mental health problems only in the immediate postpartum period, 6% of the sample experienced higher levels of mental health problems only in the late postpartum period, specifically at around 12 months, and another 6% conversely showed high levels of mental health problems only during pregnancy. In the remaining portion of the sample (4%) the mothers reported chronically high levels of distress or depressive symptoms at all timepoints (Vänskä et al., 2011).

Postpartum mental health has also been found to influence future emotional health. For example, for some women childbirth can be a trigger that leads to an increased risk of repeated depressive episodes (Robertson, Grace, Wallington, & Stewart, 2004; Wisner, Parry, & Piontek, 2002). Considering women may be dealing with varying levels of difficulty in one or more areas for an extended time after giving birth, it's important to consider the impact these symptoms may have on parenting.

Impact of postpartum wellbeing on parenting. Postpartum wellbeing influences parenting in a number of ways. According to a national survey of new mothers, a significant portion of participants reported that their emotional health (30%) and or physical health (33%) interfered at least “some” with the care of their child in the first two months (Declercq et al., 2009). Postpartum depression is associated with less synchronous behavior between a mother and infant over the first year of life (Beck, 1995). Researchers have found mothers with depression to have an increased likelihood of nonresponsive interaction styles, and instead tend to be withdrawn or intrusive (Logsdon, Wisner, & Pinto-foltz, 2006). Women experiencing the onset of depression at three months postpartum have been found to be more likely to show indifference or upset feelings when interacting with their babies (Suri, 2012).

A limitation in the research on how women’s postpartum health affects their child’s wellbeing is that much of it is based on self-report measures, both of distress levels and parenting activities. For instance, depressed mothers report that they tell stories and play games like peek-a-boo with their infants at lower rates than non-depressed mothers, but these reports could be influenced by the depression itself (Paulson, Dauber, & Leiferman, 2006). A longitudinal study that looked at predictors of parenting efficacy (defined as beliefs one has about one’s own efficacy as a parent) found that depression and anxiety in parents were negatively associated with parents’ belief in their ability to effectively parent (Biehle & Mickelson, 2011). This could mean that parents would be less likely to report the “good” things they did due to the inconsistency with their views of themselves as an ineffective parent. An exception to this is a study on the association between maternal emotional distress and parenting

healthcare choices. Infants of mothers who were experiencing mental health problems such as anxiety and depression at seven months were between three and five times as likely to have received their vaccinations late or not at all than mothers who were not (Turner, Boyle, & O'Rourke, 2003).

These changes in interactions between a mother and her infant due to postpartum emotional distress may also influence her child's current and future emotional health. Nineteen-month old infants whose mothers were depressed were less mutually responsive and harmonious during interactions with their mothers than those whose mothers were not depressed, and even after their mothers were no longer depressed they were less likely to respond positively and more likely to respond with anger to their mothers (Murray et al., 2011). In a large longitudinal study of mothers in Finland (Vänskä et al., 2011), children of mothers who experienced high levels of mental health problems in the early postpartum period showed higher levels of internalizing symptoms between the ages of 7 and 9 than children of mothers who had stable low levels of depression and distress in the perinatal and postpartum period (Vänskä et al., 2011).

In sum, despite flaws in the research, the results of these studies indicate that many women experience difficulties transitioning to parenthood in addition to the accompanying positive aspects. These difficulties are wider in scope than psychological symptoms, follow an unpredictable trajectory, and do not necessarily resolve quickly or in a predictable pattern. Individual differences have historically been understudied in the research, but have a significant impact on how women transition to parenthood. These findings bring up questions of the availability and

effectiveness of help for postpartum women. In the following section, I will review the research on existing treatment and prevention efforts currently available to new mothers.

Treatment and prevention. For the most part research supports that when women do seek treatment for postpartum distress the treatment is effective, though most existing research is narrowly focused specifically on prevention and treatment of postpartum depression rather than improving postpartum wellbeing overall (Fitelson, Kim, Baker, & Leight, 2010). Psychotherapy has empirical support for treating postpartum depression and has been shown to be superior to primary care (Cooper, Murray, Wilson, & Romaniuk, 2003; Stuart et al., 2003). Pharmacological interventions have also shown promise for treating postpartum depression, but because it's still not clear what impact medications may have on breastfeeding infants, authors have suggested that clinicians should first consider non-pharmacological interventions (Fitelson et al., 2010; Suri, 2012). In sum, professional treatment interventions for women in the postpartum period such as therapy and medication seem to be effective, at least at preventing and reducing postpartum depression.

Despite the apparent effectiveness of these interventions, women who seek professional help are still in the minority. In a national survey, only 26% of women who screened positively for experiencing either major or minor depression and less than half of women with marked symptoms of posttraumatic stress had sought professional help (Declercq et al., 2009). Among women who reported having

emotional symptoms that interfered with the care of their baby, only a third had sought help from a professional to discuss their concerns (Declercq et al., 2009).

This may be due to the reluctance women often feel to disclose negative feelings related to childbirth and parenting. There are social pressures to experience parenting in only positive lights, and these pressures can be reinforced by family and friends' discomfort with responding to their needs (Dennis & Chung-Lee, 2006; S J Lepore, Silver, Wortman, & Wayment, 1996). Women have reported feeling concerned about stigma, not wanting to tell providers or significant others, and worried about being judged as unfit to parent, sometimes even to the extent of fearing having their child taken away from them (Dennis & Chung-Lee, 2006; J. A. Maloni et al., 2013).

This reluctance to disclose goes beyond psychological or emotional concerns. Researchers have labeled the physical concerns women experience postpartum as a "hidden morbidity" due to the fact that after a woman gives birth the attention of doctors, family, friends, and parents switches from the woman to the child (Albers, 2000). Women may assume their physical concerns are a normal part of recovering from birth, and they also may be embarrassed since they include areas that are taboo (e.g. bowel problems, sexual concerns, urinary concerns).

The day-to-day complications of new motherhood may also reduce the likelihood that a postpartum mother would seek professional help for her emotional symptoms. In a recent survey of women with postpartum depression, 65% of the women sampled reported lack of time as a barrier to seeking treatment for postpartum depression (J. A. Maloni et al., 2013). Other relevant instrumental barriers to seeking

treatment included not wanting to take medication (61.5%), cost (51.9%) and lack of childcare (51.9%) (J. A. Maloni et al., 2013). Additionally, self-care is often a lower priority concern than caring for their infant or returning to work (Albers, 2000).

Although psychological treatment has been found to be an effective intervention for improving maternal wellbeing, the majority of women who are experiencing emotional symptoms are not receiving professional help due to lack of time, discomfort with seeking help, and difficulty obtaining childcare. It follows that the development of affordable, easily accessible interventions intended to facilitate adjustment in new mothers in the postpartum period is an important goal for researchers in the psychological and medical fields.

Expressive Writing

Expressive writing is a brief psychological intervention that could potentially offer a number of benefits to new mothers. Though expressive writing interventions have wide empirical support, there is not a unifying theory of why expressive writing works (J. Pennebaker, 2004). In a broad sense, expressive writing is thought to be helpful because it provides an outlet for previously suppressed thoughts and emotions, and an opportunity for exposure to unpleasant emotions (J. W. Pennebaker & Chung, 2007). Suppression is physiologically taxing, and repeated exposure to upsetting stimuli reduces its impact. The process of expressive writing also involves labeling emotions related to an unpleasant event which allows one to assign the event meaning and accommodate it into one's existing cognitive schema, and thus let go of unresolved negative emotions (J. W. Pennebaker & Chung, 2007; J. W. Pennebaker & Seagal, 1999). Details of the intervention vary, but it usually involves writing

about one's deepest feelings and thoughts related to some major (often traumatic) life event on three separate occasions with each writing session lasting between 15 and 20 minutes (Pennebaker & Beall, 1986; Pennebaker et al., 1988). Expressive writing interventions can be administered successfully online (Lange et al., 2003) and have been associated with both psychological and physical benefits in a wide variety of populations (Frattaroli, 2006). Women could complete an expressive writing intervention relatively quickly, privately, and without having to worry about transportation or childcare. Additionally, women would have the opportunity to disclose honest thoughts and feelings related to their changing role without fears of judgment or negative reactions from friends, family, or medical professionals. Research supports the idea that women might make use of such an intervention. Ninety percent of a sample of women with postpartum depression reported they were willing to use the internet to learn coping strategies for postpartum depression (J. A. Maloni et al., 2013). Expressive writing is not an adequate substitute for professional treatment such as psychotherapy. However, there is clearly a need for interventions that can help new mothers adjust and adapt to their new roles as parents and deal with the physical and emotional changes that accompany their transition.

The effectiveness of expressive writing has been extensively explored. There have been, as Smyth and Pennebaker stated in 2008, "nearly enough meta-analyses on the expressive writing studies to conduct a meta-meta-analysis". However, the results of these meta-analyses are somewhat complicated, likely due to the wide range of populations and paradigms used (Luigi Solano, Bonadies, & Trani, 2008). The earliest meta-analysis was done in 1998, and included 13 experimental studies that

included predominantly healthy participants from the general population (Smyth). In each of these studies, participants were randomly assigned to either write about traumatic experiences or neutral topic. The calculated mean weighted effect size was $d=.47$, a significant but small effect. The researchers also calculated effect sizes for five categories of outcomes. They found medium effects for psychological wellbeing ($d=.66$) and physiological functioning ($d=.68$), and small effects for reported health ($d=.42$) and general functioning ($d=.33$). The authors did not find significant improvements in health behaviors ($d=.02$).

Researchers conducted another meta-analysis a few years later (Frisina, Borod, & Lepore, 2004), using similar methods to Smyth's 1998 meta-analysis but focused solely on clinical populations including participants who were terminally ill, had post-traumatic stress disorder, psychiatric patients, arthritis, cancer, and depression. The authors found that expressive writing had a beneficial effect, but the effect size of $d = .19$ was much smaller than it was in the Smyth (1998) meta-analysis of healthy people. Additionally, the effect size was larger for physical health outcomes such as somatic symptoms and healthcare utilization ($d = .21$; $p = .01$) than it was for psychological outcomes ($d = .07$; $p = .17$) such as levels of positive and negative affect. Although the effect size for psychological outcomes was not significantly different from zero, the authors found that the interventions did positively impact individual measures of psychological symptoms such as depression, mood, anxiety, and sleep quality. Frisina et al. noted that the small effect sizes might have been partially due to small sample, low power, and heterogeneous sample. The authors suggested future studies attempt to reduce the variance associated with

samples such as age, sex, treatments outside of the writing intervention, and culture (Frisina et al., 2004).

These two meta-analyses were the first in a line of research showing empirical support for experimental disclosure. However, as Frisina et al. note, these meta-analyses used a fixed effects approach, which assumes there is one true effect size and does not allow researchers to generalize the results to studies not included in the analysis or future studies (Hedges & Vevea, 1998). A random-effects approach allows that the true effect size can vary between studies depending on differences in those studies, such as treatment intensity, participant factors, etc. Random effects analysis procedures are recommended when the goal of a meta-analysis is to make a generalization beyond the observed studies to a group of larger studies that may differ in some way (e.g. specific type of outcome measured, severity of symptomatology, etc.) (Hedges & Vevea, 1998).

The authors of a 2006 meta-analysis set out to address the limitations of the earlier two meta-analyses by using a random effects analysis, and also to examine potential moderators of the expressive writing paradigm (Frattaroli, 2006). Because studies in which participants were asked to disclose verbally were also included (4% of the studies included in the analysis), the authors refer to the intervention by a more inclusive term, experimental disclosure, rather than expressive writing. Similar to Frisina et al., the authors obtained both an overall effect size and separate effect sizes for different outcome types. Consistent with Smyth's 1998 findings, the authors found improvements in all categories after disclosure in all areas explored except for health behaviors. These areas were psychological health, physiological functioning,

reported health, subjective impact of the intervention, and general functioning. Participants also tended to report improvements in their general health, outcomes related to specific diseases, and illness behaviors. In general, experimental disclosure seemed to impact subjective measures of health more than objective measures. Participants in treatment groups were also more likely to have a positive attitude about the intervention, and scored higher on measures of general functioning such as work, social relationships and cognitive functioning (Frattaroli, 2006). The authors also noted that in the eight studies in which the writing interventions were administered in the most optimal way (privacy during the sessions, specific instructions, at least three disclosure sessions) the effect size was larger ($r = .20$). The author surmised that the small effect size may be due to the larger proportion of unpublished studies used compared to the earlier meta-analyses and the large variance in quality and dosage within the studies.

As Pennebaker suggested, the authors of this meta-analysis also expanded the question of the effectiveness of expressive writing interventions to include when and for whom it works. Effect sizes tended to be larger when the studies included samples in which participants had physical health problems, a history of trauma or stressors, were not primarily college students, wrote at home (rather than in a lab) or in a private setting, were paid, follow-up was within one month of intervention, had at least 3 disclosure sessions, had sessions at least 15 minutes long, wrote about previously undisclosed topics, wrote about recent topics, and did not have their writings collected by the experimenter at the end (Frattaroli, 2006).

As the research on expressive writing has grown, there has been an increased focus in considering how different characteristics of the population may interact with expressive writing's effectiveness (e.g. Solano et al., 2008). Authors of another meta-analysis conducted in 2006 used a random effects approach and focused specifically on randomized trials of expressive writing that used health care visits as an outcome measure. Researchers tend to interpret fewer health care visits as an indication of better overall well-being (Harris, 2006). Participants were broken up into three categories: "healthy" (college students), "medical" (dealing with specific pre-existing medical conditions), and "psychological" samples. The sample defined as psychological included a wide range of participants who had either experienced a stressful experience, had a specific psychiatric diagnosis such as posttraumatic stress disorder, or had high somatic symptoms with no specific medical diagnosis.

In the healthy group, the combined effect size was ($g=0.16$, 95% CI = 0.02 to 0.31), indicating a small but significant effect. The other two groups, the psychological and medical groups did not show a statistically significant impact on health care utilization (Harris, 2006). The authors noted that health care utilization may be positive or negative depending on the individual, and that this may account somewhat for the small effect sizes. For instance, the medical group may have more of a necessity to use health care than the other groups. Additionally, they proposed that this intervention may not have the potency to impact psychological samples (Harris, 2006).

Another possible reason for the null findings in the psychological sample of Harris' 2006 study may be large variance within the sample. Solano et al. (2006)

discussed the idea that large meta-analyses done without consideration for major differences in population and intervention are antithetical to the idea of exploring for whom, why, and to what extent interventions work. In an attempt to further explore when and for whom these interventions are effective the authors classified the different types instructions for interventions and different clinical populations with whom expressive writing had been tested into four categories and summarized the results obtained within those populations at that point (Luigi Solano et al., 2008). In the first two categories participants are asked to write specifically about recent loss of loved ones or severe trauma, or asked to write specifically about chronic disease during a life-threatening phase. In both of these categories researchers have found predominantly found null effects, and Solano et al. point out there are ethical problems with these interventions. The third and fourth categories of interventions with clinical populations have shown significantly more promise. In the third category participants with moderately severe disease or well-treated chronic disease write about events other than the illness. In the final category and the one most applicable to the present study, participants with moderately severe disease or moderately stressful life events with expected positive outcomes that are often within the participants' control write specifically about their situation. Participants this category of intervention have shown significant improvements such as quicker recovery after minor surgery and decreased physical symptoms after effective breast cancer treatment (L. Solano, Donati, Pecci, Persichetti, & Colaci, 2003; Stanton, 2002). Women in the postpartum period would fit best into the last category, as they

have gone through a moderately stressful life event and it is reasonable to expect positive outcomes.

Expressive writing and postpartum women. Expressive writing could be an especially suitable intervention for this population, and though it has not been tested with postpartum women, studies with populations with similar concerns have shown promise. For example, researchers found pregnant women who wrote about their difficulties during pregnancy such as unemployment and gestational diabetes had a reduced incidence of postpartum depression (Bucci, Donati, & Solano, 2004). Social support has been found to be an important contributor to postpartum wellbeing (Leahy-Warren et al., 2012), and research on other populations has shown that expressive writing may temper the harmful effects of low social support. For example, expressive writing has been found to be associated with reduced gay-related stress for gay men with low levels of social support (Pachankis & Goldfried, 2010).

An important consideration when developing an expressive writing intervention for postpartum women is that writing about negative and traumatic events has been associated with an initial increase in negative affect, despite longer term benefits (M. E. Gillis et al., 2006; Smyth, 1998). Because postpartum women appear to be at a higher risk for emotional distress, interventions that increase negative mood may be unnecessarily risky. Although a short-term increase in negative affect was initially thought to be a necessary component of the process of expressive writing (J. Pennebaker, 1993), meta-analyses have found average short-term distress to be unrelated to long-term improvement (Smyth, 1998), and authors of a recent review of expressive writing note that the data indicates people likely do not

need to write about traumatic events in order to benefit from the intervention (Smyth & Pennebaker, 2008). For example, in a study exploring the impact of expressive writing on women receiving treatment for breast cancer, women who wrote either about their deepest thoughts and feelings related to breast cancer or about any positive experiences related to living with cancer (such as an increased sense of meaning or gratitude for previously unappreciated experiences) visited the doctor less frequently for cancer-related issues in the three months following the intervention compared to the control group (Stanton, 2002) (Low, Stanton, & Danoff-Burg, 2006). Other examples of positive writing topics such as intensely positive experiences or one's best self, have been found to increase initial positive affect while conferring similar long-term benefits for participants (Burton & King, 2004; King, 2001). Researchers have theorized that positive and traditional writing interventions have both shared and unique mechanisms responsible for their associated benefits. For instance, whereas both positive and traditional writing interventions involve the process of labeling emotions, traditional writing interventions are more likely to provide exposure to unpleasant events. Based on positive psychology research, positive writing is theorized to work through inducing positive emotions, broadening attention and building coping skills (Burton & King, 2004). Research supporting this theory has found positive experiences and mood to be associated with an increased ability to benefit from positive experiences and to generate multiple possible solutions to problems (Fredrickson & Joiner, 2002), and increased creativity and efficient problem-solving (Estrada, Isen, & Young, 1994).

Pennebaker recommended that researchers examine not only the effectiveness of expressive writing, but also the situations in which it works, and with whom it works (Pennebaker, 2004). Researchers in the positive psychology field have issued a similar call (Sin & Lyubomirsky, 2009). In an attempt to advance the literature in the expressive writing and positive psychology fields, the present study compared two forms of positive expressive writing interventions intended to improve the well-being of postpartum women: Self-Affirmation and Mindfulness.

Self-Affirmation

Self-affirmation theory is based on the idea that people are motivated to protect their self-integrity. Self-integrity is defined as the image of oneself as “good and appropriate person”, with good and appropriate being defined by one’s culture and context (D. K. Sherman & Cohen, 2006). Threats to self-integrity occur when one perceives that they have failed to succeed at a socially or culturally significant standard (Leary & Baumeister, 2000). Being a good mother is a prime example of a culturally significant standard as well as a time when failures can occur every day for both parents. Examples of failures a new mother may experience include seeing that sometimes she misunderstands her child’s cues, having a more difficult time getting back to work (or not working) than expected, and being unable to soothe a colicky child.

The need to preserve one’s self-integrity in the face of such threats can lead to three different types of responses (Sherman & Cohen, 2006). The first type of response is accepting the failure or the threatening information and using it to change one’s attitudes or behavior. For example, a new mother may recognize her difficulties

and ask for help from friends and family. However, according to self-affirmation theory it may be too threatening to have this type of response when an especially important or valued part of the self-concept is threatened. In these cases, to maintain self-integrity, one might dismiss, deny, or avoid the information. These defensive reactions are the second type of response to failure or threat. For example, a new mother may deny the existence of any difficulties with adjusting, and thus not seeking help from family or friends.

Self-affirmation theory proposes an opportunity for a third type of response that allows one to maintain shorter-term self-integrity in addition to making adaptive behavior or attitude change (Sherman & Cohen, 2002). This response occurs when people are reminded of other parts of themselves, other strengths and resources unrelated to the threatened self-concept, and thus realize that their entire self-worth doesn't rely on the immediate threatening information and no longer need to distort the information to maintain their self-integrity and are able to make adaptive changes. When a new mother is reminded of characteristics and values unrelated to her identity as a new mother, such as her skills at work, relationships, or even her sense of humor, the failures and struggles of early parenthood may seem less threatening. She may recognize that her self-concept involves more than being a mother, and thus be able to accept perceived failures without defensive responses.

In traditional self-affirmation interventions participants in a laboratory setting are asked to think and write about personally important values, and then presented with unrelated threatening information (Sherman & Cohen, 2002). For example, a study of college students compared the responses of coffee drinkers and non-coffee

drinkers asked a portion of the sample to complete a self-affirmation intervention in which they stated a central value of personal importance to them. The participants then read an article (written for the study) linking caffeine consumption to fibrocystic disease (Sherman, Nelson, & Steele, 2000). In the control condition, coffee-drinking women were more resistant and critical of the article than non-coffee drinkers. However, coffee drinking women who had completed a self-affirmation intervention were more open to the message in the article than any other group and also stated they intended to reduce their coffee intake. More recent research has begun to explore long-term and real life applications, such as improving grades in the face of stereotype threat (D. K. Sherman & Cohen, 2002).

Self-affirmation has been found to mediate the relationship between expressive writing and health-related benefits (Creswell et al., 2007). Creswell et al. analyzed qualitative data from an expressive writing study with women with breast cancer (Stanton, 2002), and found the number of affirming statements made in the essays fully mediated the effects of the writing intervention on physical symptoms three months later, indicating that self-affirmation was perhaps a mechanism through which writing interventions work (Creswell et al., 2007). In a more recent study, authors looked at the ways in which a self-affirmation writing intervention impacted college-student stress levels (operationalized as amounts of epinephrine and norepinephrine in their urine and self-report) in the weeks approaching their most stressful test (Sherman, Bunyan, Creswell, & Jaremka, 2009). Only participants in the control condition showed increased physiological indicators of stress on examination day compared to baseline measures taken two weeks earlier, indicating that self-

affirmation can attenuate the nervous system's responses to stressors (D. K. Sherman et al., 2009). In addition to these physical and physiological outcomes, self-affirmation has been associated with less perceived stress (Keough et al., 1998) and quicker recovery after failure (Silverman, Logel, & Cohen, 2013). Self-affirmation theory is specifically applicable to the post-partum population as its primary function is to assist people with coping with threats to valued parts of their self-concept. The present study is the first to test the effectiveness of self-affirmation interventions with women in the postpartum period.

Mindfulness

Mindfulness is rooted in the concepts of receptive awareness and attention (K. W. Brown, Ryan, & Creswell, 2007). Whereas awareness is our actual experience, attention is when we focus on it or take notice of it. After attending to something, we often rapidly go through a chain of cognitive processes including appraising whatever is happening as good, bad, or neutral, associating it with memories of similar events, and then assimilating it into our cognitive schemas. For example, when a mother hears her child crying, she may immediately appraise it as a negative event, think about the other times her child has cried, and assimilate this into her schema of herself as a bad mother or her child as a difficult child. This chain of processing prevents seeing events as they really are rather than through the filters of prior experiences, removes one from the present moment, and makes one vulnerable to getting caught up in ruminating about the past and worrying about the future (Baer et al., 2006; Kabat-Zinn, 2003a). Conversely, with mindfulness a new mother would be able to bring a "kind attention" (Greeson & Brantley, 2009) to her thoughts and

feelings associated with her child's cry, openly accepting and observing them rather than becoming lost and caught up in them or reacting self-critically or defensively. Research supports the association between mindfulness and non-defensive processing of challenging events (such as feeling excluded from a group) (Brown, Ryan, & Creswell, 2007). This open attention to the present is thought to increase well-being by increasing clarity and vividness of experience, and increasing attunement to one's own basic needs (Kabat-Zinn, 2003a). A new mother would thus also theoretically be able to get more enjoyment from parenting as she would be free from the distraction that dwelling on frustrations or perceived mistakes could bring.

The definitions of mindfulness in the literature vary related with respect to whether mindfulness is a unitary construct and whether it is a trait or a state, and researchers have been encouraged to resolve these disagreements (Chiesa & Serretti, 2010). Although that task is beyond the scope of the current project (or any one project), one step toward this goal is to be clear about the definition of mindfulness being used. In the present study, mindfulness was defined as a trait-like tendency that involves multiple facets: observing the present moment, labeling present experiences, acting with awareness, nonjudgment of inner experiences, and nonreactivity to inner experiences, as measured by the five-facet mindfulness questionnaire (Baer et al., 2006).

A number of different types of psychological interventions incorporate some aspect of mindfulness. The best known may be Mindfulness-Based Stress Reduction (MBSR), first developed and studied by Jon Kabat-Zinn (1982) with the intention of teaching self-regulation of chronic pain in medical settings. MBSR has

been studied extensively as a treatment for specific and general psychological and physical symptoms, and in a 2003 meta-analysis that looked at mean effect sizes of reductions in symptomatology among MBSR study participants in experimentally controlled studies, investigators found a mean effect size of $d = .42$ for physical health outcomes and a mean effect size of $d = .50$ for mental health outcomes (Grossman, 2004).

Mindfulness and new mothers. Research on mindfulness interventions for women transitioning to parenthood is in a nascent stage and most of the studies focus on women during pregnancy. However, mindfulness interventions with both mothers-to-be and new mothers have shown promising results. In a 2008 pilot study of pregnant women with mood or stress concerns, participants in the experimental group underwent an eight-week group mindfulness training during pregnancy (Vieten & Astin, 2008). Ten weeks after baseline measures were taken (during the third trimester), participants who went through the training had significant decreased levels of depression, state anxiety, and perceived stress and increased levels of positive affect, affect regulation, and mindfulness increased compared to the control group (Vieten & Astin, 2008). A pilot study examined the effects of a mindfulness-based intervention for pregnant women and their partners (Duncan & Bardacke, 2010). At post-test, participants showed increases in mindfulness and positive affect and decreases in depression, negative affect and pregnancy anxiety.

A more recent pilot study was the first to examine the effects of a mindfulness-based intervention on new mothers (Perez-Blasco, Viguer, & Rodrigo, 2013). Experimenters randomly assigned 26 breastfeeding women who had given

birth an average of ten months beforehand to either an eight-week mindfulness-based intervention or a comparison group that received no treatment. Three weeks after the end of the intervention, participants in the mindfulness condition reported, among other outcomes, significantly higher maternal self-efficacy than the participants in the control group (Perez-Blasco et al., 2013).

Mindfulness and expressive writing. Although writing interventions related to mindfulness (such as acceptance) have been considered *positive* writing (e.g. Baum & Rude, 2012), the mechanisms through which they work may be more similar to those associated with traditional expressive writing interventions. Through writing about their experiences from a mindful perspective, participants theoretically experience exposure to difficult and perhaps suppressed thoughts and emotions (unlike interventions in which participants write solely about positive topics). What theoretically changes this intervention from traditional to positive is the approach to the topic. In the present study participants were encouraged to write about their transition to parenthood from a mindful perspective. Mindfulness has been shown to reduce thought patterns related to continued negative emotion such as rumination and worry (Ramel, Goldin, Carmona, & McQuaid, 2004), and thus writing from a mindful perspective could prevent the short term increase in negative affect associated with the traditional expressive writing paradigm.

A recent study in which researchers used an acceptance writing condition, supports this hypothesis (e.g. Baum & Rude, 2012). Participants were assigned to either a traditional expressive writing intervention or an acceptance condition, in which they were encouraged to accept their distressing emotions and express self-

compassion. The acceptance condition was beneficial for participants with mild depression. In the traditional condition, participants with very low (or essentially no) depression showed even lower scores at posttest. However, the participants in the traditional condition with very high initial depression scores had even higher scores at posttest. The authors noted these results could indicate that traditional expressive writing conditions may be less effective for severely distressed people (Baum & Rude, 2012).

Pennebaker and Segal (1999) asserted that expressive writing works because one is accepting and accommodating an unpleasant event into one's existing cognitive schema. Some researchers have argued that the act of writing about one's experiences induces a mindful state by increasing awareness, labeling thoughts and feelings, and increasing exposure to and comfort with often-avoided topics (Brody & Park, 2004). Authors of a recent study noted that this process is theoretically related to the ability to be mindful and willingly address and accept one's inner experiences (Poon & Danoff-Burg, 2011). They hypothesized that those higher in trait mindfulness would benefit more from expressive writing due to a greater ability to participate in the intervention. The authors measured trait mindfulness in undergraduates and then randomly assigned them to either a traditional expressive writing intervention or a neutral control condition in which they wrote about their daily and weekly tasks. Participants in the experimental condition had better sleep quality, fewer physical and psychological symptoms and more positive affect at the one-month follow-up than they had at baseline, whereas participants in the control condition scored lower on these measures than they had at baseline. Trait mindfulness

moderated these results, with higher levels of mindfulness associated with larger increases in positive affect and sleep quality, and larger decreases in psychological symptoms, physical symptoms, and negative affect (Poon & Danoff-Burg, 2011).

If trait mindfulness increases the effectiveness of traditional expressive writing interventions because of the similarity between the concepts of mindfulness and the process of expressive writing, it would make sense that trait mindfulness would also moderate the effectiveness of a mindfulness intervention. However, authors of a 2013 study found discomfort with emotion, but not trait mindfulness, moderated the effectiveness of a brief mindfulness intervention (Sass, Berenbaum, & Abrams, 2013). Mindfulness involves sitting with unpleasant emotions and allowing oneself to experience them, and thus it makes sense that discomfort with emotion would make mindfulness interventions more challenging, but the question of why mindfulness was not a moderator remains. Discomfort with emotion was measured with the Affective Control Scale (ACS; Williams et al., 1997). Representative items include things like “I can get too carried away when I am really happy” and “Depression could really take me over, so it is important to fight off sad feelings” and “I would be embarrassed to death if I lost my temper in front of other people”. These concepts are similar to two of the five facets of mindfulness: nonreactivity to inner experiences and nonjudgment of inner experiences. It’s possible that these two facets, rather than mindfulness as a whole may moderate the effects of a mindfulness intervention. A person with lower levels of trait tendencies of observing the present moment, labeling present experiences, and acting with awareness, may struggle somewhat during a mindfulness intervention but someone who scores lower on the

remaining two facets, reactivity to and judgment of inner experiences (such as upsetting thoughts and feelings) may experience a level of distress that prevents them from fully participating and thus benefitting from the intervention. In the present study these two components of mindfulness were tested as possible moderators of the mindfulness writing condition. These components were not expected to moderate the effectiveness of the self-affirmation condition, as the primary task of that condition did not require acceptance of thoughts and feelings.

Chapter 3: Statement of the Problem

Although there is a considerable amount of research on the postpartum period, studies tend to focus primarily on postpartum depression and often fail to consider individual differences that may influence when and with whom certain interventions are most effective (Hoffenaar et al., 2010). The transition to motherhood is a complicated time and different women experience varying degrees of distress depending on individual differences (Hoffenaar et al., 2010). Nonetheless, many women report experiencing physical and psychological distress during this time (Declercq et al., 2009). Many are not seeking help from friends, family, or professionals due to stigma and instrumental and emotional barriers (Maloni, Przeworski, & Damato, 2013), yet there has been little research on easily accessible interventions that attempt to increase women's wellbeing during the transition to parenthood (Engle, 2009). To address these gaps in the literature the present study compared the effectiveness of two types of expressive writing interventions against a waitlist control condition at increasing wellbeing and decreasing emotional distress based on the theories behind expressive writing, self-affirmation, and mindfulness.

Expressive writing is an easily accessible intervention that has been found to improve wellbeing in a number of populations (Frattaroli, 2006) but until now had not been studied with women in the postpartum period. To avoid the possible risk of increased short-term negative affect associated with the traditional expressive writing paradigm (M. E. Gillis et al., 2006), two positively focused writing interventions, which have also been found to improve physical and psychological symptoms (Baikie, Geerligs, & Wilhelm, 2012), were used in the present study. Both of the

writing interventions were expected to increase participants' wellbeing as compared to the control condition, as both were grounded in the theoretical foundations of expressive writing. For example, participants in both conditions had an outlet to express emotions or thoughts they may have been holding back related to motherhood, and both conditions provided at least some level of exposure to difficult feelings, and the opportunity to label these feelings, which theoretically should have given the participants the opportunity to assign meaning to the difficult aspects of their experiences (J. W. Pennebaker & Chung, 2007).

The aim of the mindfulness condition was to increase participants' acceptance of their thoughts and feelings, and increase awareness of the present moment through approaching expressive writing mindfully. Participants in this condition were asked to remain aware of their internal experiences, observing and describing their thoughts and feelings as they experience them, and refrain from judging or reacting to these feelings as they write (Baer et al., 2006). This was intended to reduce their self-criticism, and increase their ability to take joy in the positive reflections they may have otherwise missed due to obsessing or being "stuck" on worries and ruminations (Kabat-Zinn, 2003).

The aim of the self-affirmation condition was to increase participants' ability to accept threatening information related to parenthood (e.g. failures and worries) by reminding them of other valued characteristics of themselves (D. K. Sherman & Cohen, 2006). Participants in this condition were asked to think and write about characteristics they value that are unrelated to parenthood and how these characteristics have influenced their experiences as a mother so far. This was

intended to reduce the threat associated with thinking about difficulties related to motherhood, and thus decrease the need for defensive responses such as denial or self-criticism (D. K. Sherman & Cohen, 2006).

To further the research on mindfulness, expressive writing, self-affirmation, and the transition to parenthood, the present study compared the effectiveness of these two writing conditions against a waitlist control condition at improving wellbeing in postpartum new mothers across a number of domains. There has been a call for researchers studying mindfulness (Sass et al., 2013), expressive writing (J. W. Pennebaker, 2004), and positive psychology interventions (Sin & Lyubomirsky, 2009) to examine moderators as well as main effects, as individual differences may play a role in determining who benefits from certain type of writing interventions. Thus, two facets of mindfulness, nonreactivity to inner experience, and nonjudgment of inner experience, were examined as potential moderators of the mindfulness condition. Based on the gaps in the literature, this study examined the following hypotheses and research questions.

Hypotheses and Research Questions

Hypothesis 1a: Participants in the mindfulness condition will use a higher percentage of negative emotion words than participants in the self-affirmation condition.

Hypothesis 1b: Participants in the self-affirmation condition will use a larger percentage of positive words than participants in the mindfulness condition.

Rationale for Hypothesis 1. The instructions in the two active conditions will differ such that participants in the mindfulness condition were asked to write about their thoughts and emotions related to being a mother from a mindful perspective, that

is, to allow themselves to experience their thoughts and feelings without judgment, and without becoming caught up in them. Participants in the self-affirmation condition were asked to write about their most valued characteristics, and how these helped them with the transition to motherhood. Due to these differences, I expected the differences in content between conditions to would be identifiable at a rate above chance.

These conditions were also expected to differ with respect to the percentage of positive and emotion words written. A recent study comparing an acceptance-enhanced writing intervention, in which participants were instructed to stay present with their emotions and refrain from judgment (a concept based in mindfulness), to a traditional expressive writing intervention found that participants in the acceptance-enhanced condition used a significantly higher number of negative emotion words than participants in the traditional program (Baum & Rude, 2012). The authors surmised that the participants in the acceptance-enhanced condition, who read directions encouraging them to accept all of their emotions, even the distressing ones, may have spent more time on thinking and writing about difficult topics. I expected similar results as in the present study participants in the mindfulness condition were instructed to accept and express any difficult thoughts and feelings that they may experience without judgment, whereas participants in the self-affirmation condition were instructed to discuss their most valued parts of themselves.

Although Baum and Rude did not find a difference in the number of positive words between the traditional and acceptance interventions (2012), the present study was different, in that rather than a traditional expressive writing paradigm the

mindfulness condition was compared to a self-affirmation condition. Because participants in the self-affirmation condition began their intervention with “a positive reflection on a valued self-domain” (Creswell et al., 2007), I assumed that participants in this condition would use more positive emotion words than participants in the mindfulness condition.

Hypothesis 2a: Participants in the experimental conditions will report lower depression as measured by the Edinburgh Postnatal Depression Survey at follow up than those in the waitlist control condition.

Hypothesis 2b: Participants in the writing conditions will report lower anxiety as measured by the Penn State Worry Questionnaire at follow up than those in the waitlist control condition.

Hypothesis 2c: Participants in the writing conditions will report fewer complaints with regard to psychological and physical wellbeing as measured by the M-PHI at follow up than those in the waitlist control condition (see figure 7).

Rationale for hypothesis 2. Multiple meta-analyses have shown a range of small to medium effect sizes for expressive writing interventions on psychological health outcome variables (Frattaroli, 2006; Smyth, 1998) and physical health outcome variables (Frisina, Borod, & Lepore, 2004). The literature also supports the use of positive writing specifically for both psychological and physical health (Baikie et al., 2012; Burton & King, 2004). Because of this, I predicted that participants in both expressive writing conditions would have lower outcome measures of complaints with regard to physical and psychological health than participants in the control conditions.

Hypothesis 3a. The relationship between writing condition and follow-up depression will be moderated by baseline levels of nonreactivity to inner experiences such that, controlling for baseline depression scores, for those in the mindfulness condition the more reactive to their inner experiences they are (i.e. the lower their scores are on the nonreactivity to inner experience subscale of the FFMQ) the higher their outcome depression scores will be, whereas for those in the self-affirmation condition outcome depression scores will not differ as a function of baseline nonreactivity.

Hypothesis 3b. The relationship between writing condition and follow-up anxiety will be moderated by baseline levels of nonreactivity to inner experiences such that, controlling for baseline levels of anxiety, for those in the mindfulness condition the more reactive to their inner experiences they are (i.e. the lower their scores are on the nonreactivity to inner experience subscale of the FFMQ) the higher their outcome anxiety scores will be, whereas for those in the self-affirmation condition outcome anxiety scores will not differ as a function of baseline nonreactivity.

Hypothesis 3c. The relationship between writing condition and follow-up well-being will be moderated by baseline levels of nonreactivity to inner experiences such that, controlling for baseline levels of wellbeing, for those in the mindfulness condition the more reactive to their inner experiences they are (i.e. the lower their scores are on the nonreactivity to inner experience subscale of the FFMQ) the more complaints related to wellbeing they will report at outcome, whereas for those in the

self-affirmation condition outcome complaints related to wellbeing will not differ as a function of baseline nonreactivity.

Hypothesis 3d. The relationship between writing condition and follow-up depression will be moderated by baseline levels of nonjudgment of inner experiences such that, controlling for baseline depression scores, for those in the mindfulness condition the more judgmental of their inner experiences they are (i.e. the lower their scores are on the nonjudgment of inner experience subscale of the FFMQ) the higher their outcome depression scores will be, whereas for those in the self-affirmation condition outcome depression scores will not differ as a function of baseline nonjudgment.

Hypothesis 3e. The relationship between writing condition and follow-up anxiety will be moderated by baseline levels of nonjudgment of inner experiences such that, controlling for baseline levels of anxiety, for those in the mindfulness condition the more judgmental of their inner experiences they are (i.e. the lower their scores are on the nonjudgment of inner experience subscale of the FFMQ) the higher their outcome anxiety scores will be, whereas for those in the self-affirmation condition outcome anxiety scores will not differ as a function of baseline nonjudgment.

Hypothesis 3f. The relationship between writing condition and follow-up well-being will be moderated by baseline levels of nonjudgment of inner experiences such that, controlling for baseline levels of wellbeing, for those in the mindfulness condition the more judgmental of their inner experiences they are (i.e. the lower their scores are on the nonjudgment of inner experience subscale of the FFMQ) the more

complaints related to wellbeing they will report at outcome, whereas for those in the self-affirmation condition outcome complaints related to wellbeing will not differ as a function of baseline nonjudgment.

Rationale for Hypothesis 3. Authors of a recent study found that mindfulness as measured by the Freiburg Mindfulness Inventory (FMI, 2001) moderated the effects of a traditional expressive writing exercise (Poon & Danoff-Burg, 2011), and this was thought to be due to the theoretical similarities between expressive writing and mindfulness. However, another study found instead that discomfort with emotion, not mindfulness as measured by the FFMQ (Baer et al. 2006), moderated the effects of a brief mindfulness intervention (Sass et al., 2013). These findings may be due to the characteristics of the measures used. The Freiburg Mindfulness Inventory is intended to be interpreted unidimensionally, and primarily assesses nonjudgmental observation of the present moment and openness to negative experience (Baer et al., 2006), whereas the five-facet mindfulness questionnaire (FFMQ), is a multidimensional measure with broader categories. Two of these categories, nonreactivity to inner-experience and non-judgment experience of inner experience, may be more involved in how fully one can participate in a mindfulness intervention, which asks participants to accept their thoughts without reacting or judging them. This is supported by the finding that discomfort with emotion *did* moderate the effects of the mindfulness intervention, as items from this scale are very similar to items from these two subscales. The remaining facets; describing, observing, and acting with awareness, are conceptually different, and may have created noise that obscured the relationship between the other two facets and the effectiveness of the

intervention. The self-affirmation condition does not focus on accepting thoughts that may be upsetting to participants and instead focuses on asking participants to think about valued aspects or characteristics of themselves. Judgment and reactivity to inner experiences were not expected to interrupt this process and thus outcome measures were not expected to differ as a function of baseline levels of these variables in the self-affirmation condition. Please see Figures 1 and 2 for visual depictions of the expected interactions between baseline measures of nonjudgment (Figure 1) and nonreactivity (Figure 2) and condition for the outcome variables of outcome depression, outcome anxiety, and outcome complaints related to postpartum wellbeing.

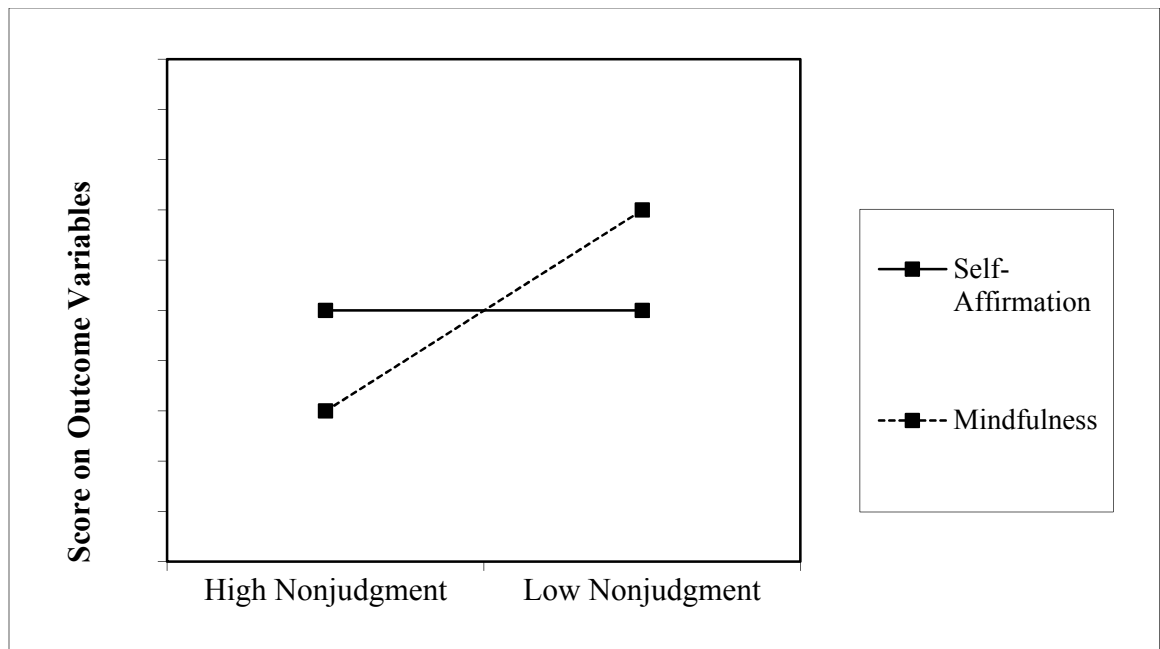


Figure 1: Hypothesized interaction between baseline nonjudgment and condition predicting score on outcome variables depression, anxiety, and complaints related to wellbeing.

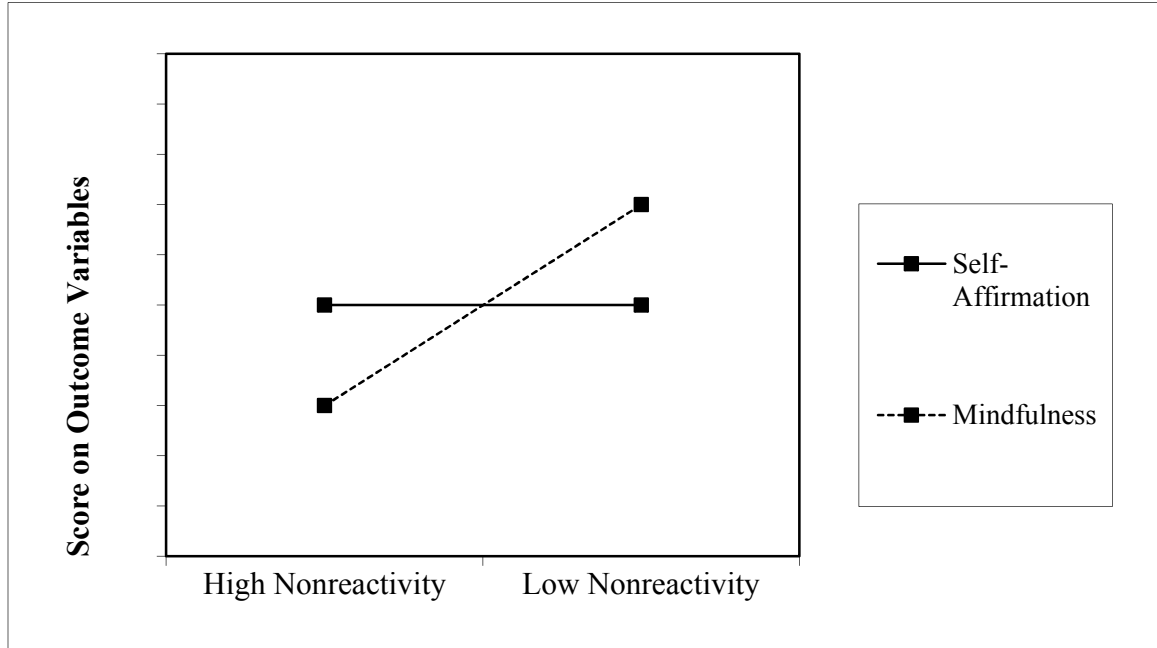


Figure 2: Hypothesized interaction between baseline nonreactivity and condition predicting score on outcome variables of depression, anxiety, and complaints related to wellbeing.

Research Question 1: Will participants in the mindfulness condition report an increase in mindfulness at follow up? Previous studies of traditional expressive writing have not found increases in mindfulness (Moore, Brody, & Dierberger, 2009; Poon & Danoff-Burg, 2011). However, the authors of that study note that they did not expect any change since there were no mindfulness-based instructions. It is unclear as to whether such a brief intervention will have any lasting effect on a trait variable such as mindfulness, but considering the other considerable effects expressive writing has been shown to have it is possible that expressive writing with specific mindfulness instructions could have some impact on overall mindfulness.

Research Question 2: Will participants' reported levels of positive and negative affect change over the course of the writing sessions for the mindfulness and self-affirmation conditions? There is little research on the influence of positive writing interventions on positive and negative affect. Whereas some authors have found reductions in negative affect after expressive writing interventions (Leary, Tate, Adams, Allen, & Hancock, 2007), some have found no significant influence on mood at all (Zabelina & Robinson, 2010). As stated earlier, some postpartum women are vulnerable to mood disorders, and it is important to examine the impact interventions have on positive and negative affect.

Chapter 4: Method

Power Considerations

A power analysis was conducted to determine the number of participants necessary to determine an effect considering desired alpha and power and effect sizes found in previous research. Most meta-analyses of expressive writing find small effect sizes (e.g. Frattaroli, 2006). Using the online power calculator G*Power (Faul, Erdfelder, & Buchner, 2007), it was determined that to obtain power of .80, and a small effect size, 1,552 participants would have been needed. This is based on an alpha of .01 to adjust somewhat for type I error. However, more recent papers have discussed the idea that expressive writing has different magnitudes of effects with different populations (e.g. Solano, 2005). The type of population used in this study was determined to be most similar to ones in which expressive writing has shown large effects. For example, in a study examining the effectiveness of an expressive writing intervention against a control group, effect sizes were medium for physical symptoms and large for psychological symptoms (Poon & Danoff-Burg, 2011). With a specified medium effect size, the number of participants needed was 254.

Participants

Participants were first-time mothers who gave birth in the last six weeks to ten months, so that all participants would complete follow-up measures for the study within the extended postpartum period (between six weeks and one year). The final sample consisted of 257 participants with complete data.

Age of Mother and Baby. A review of the demographic variables showed the age of the participants ranged from 24 to 43, with a mean age of 33.7 years. The age of the baby at baseline ranged from 9 to 42 weeks, with a mean age of 26.48 weeks (around six months). The majority of the babies were between 17 and 24 weeks old ($n=80$; 5-6 months postpartum), and between 33 and 42 weeks old (9-10 months postpartum; $n=77$), with slightly less between the ages of 25 and 32 weeks old (7-8 months postpartum ; $n=64$), and the smallest number of babies were between 9 and 16 weeks (3-4 months postpartum; $n=36$.)

Ethnicity. The majority of the sample (67.4%) was European-American (this includes two participants who responded other and wrote in “White American” and “Caucasian”), 14.7% was African-American, 7.2% Latin-American, 6% Asian-American/Pacific Islander, 2.7% Middle-Eastern American, and 2% of participants did not respond. Due to a mistake in the design of the survey, participants were only allowed to check one choice, even though they were advised to check all that apply, so it may not be an accurate portrayal of the ways in which the participants self-identify in terms of ethnicity.

Work, income, relationship status, breastfeeding status, and mental health status. Of the 257 women who completed all the measures, approximately 65% of the women were working full-time at the time of the survey and 11.3% were working part-time. Approximately 15% of the sample was unemployed, half of who were unemployed unrelated to the pregnancy or birth. The remaining nine percent of the sample was on family leave, and this was approximately evenly split between paid and unpaid.

The household income was above \$100,000 a year for 71.6% of the sample, between \$60,000 and \$100,000 for 20.6 percent of the sample, and between \$40,000 and \$60,000 for the remaining 7.8 percent of the sample.

Exploring the relationship status of the sample revealed that 86.8% of the participants were married, in a civil union, or a domestic partnership. An additional 3.9% were living with their partner, 3.1% of the participants were in a relationship but not living with their partner, and 6.2% were single. Among those who were in a relationship of some kind, 80.6% of the partners were employed full time, 6.2% of the partners were no longer employed since the birth of the baby, 3.9% of the partners were employed part time, and 3.1% of the partners were not employed unrelated to the birth of the child.

A large majority of the sample (81.7%) was breastfeeding at the time of the study. This is similar to the national rate of women that report ever having breastfed (79.2%), and higher than the national rate of women reporting still breastfeeding at 6 months (49.4%), (Centers for Disease Control and Prevention's Breastfeeding Report Card, 2014).

Fourteen percent of the participants in the sample were on prescription medication to address a psychological or mood disorder, and 12% of the sample was currently seeing a mental health professional for counseling or therapy. Medications listed by participants included citalopram (Celexa), certraline (Zoloft), and trazodone (Desyrel), all medications commonly used to treat depression or anxiety.

Measures

Manipulation Check. As a manipulation check, participants in both conditions filled out a one-item 5-point manipulation check after their writing exercises. For the self-affirmation condition, this item read “During the previous 15 minutes of writing, how much did you attempt to focus on the value or characteristic you chose to write about?” with possible responses ranging from not at all to the entire time. In the mindfulness condition, the item read “During the previous 15 minutes of writing, how much did you attempt to accept the thoughts and feelings that occurred as you were writing?” with possible responses ranging from not at all to the entire time.

Expectation of Improvement. The participants’ expectations of improvement were measured using two scales adapted from the Credibility and Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000). Expectation of improvement have been found to influence treatment outcomes (e.g. Borkovec & Costello, 1993) and thus it is recommended that researchers assess for any differing expectations of improvement in comparison groups. One of the adapted scales was administered to the writing conditions (See Appendix D) and one to the control condition (Appendix E).

The original scale has two factors, one in which items pertain to clients expectations for therapy, and one that pertains to how credible clients perceive the therapy to be. The three items pertaining to credibility were removed for the current study since the participants had no information about the intervention and nothing on which to base credibility ratings, leaving three items that assess client’s expectations of improvement. Additionally, in the scale adapted for the experimental group,

“treatment” was changed to “exercise” in all of the items. In the scale adapted for the waitlist control group, the word “treatment” was changed to refer to “the passage of time” or “five weeks from now”. (e.g., At the end of this exercise/five weeks from now, how much better do you think you will feel”. The expectancy factor of the original CEQ has been shown to have a high internal consistency (α between .79 and .90), inter-item correlations between .53 and .85, and one-week test-retest reliability to be .82.). The internal consistency coefficient alpha of the Expectations of Improvement Scale for the present study was .91.

Trait Anxiety. The Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger & Borkovec, 1990; See Appendix F) was used to assess levels of worry. The PSWQ is a 16 item 5-point scale designed to assess pathological worry. Example items include “my worries overwhelm me” and “many situations make me worry.” Participants rate the items on a scale ranging from 1 (not at all typical of me) to 4 (very typical of me).

The PSWQ has shown high internal consistency (α =.86-.95) and test-retest reliability (.74-.93 over 2 to 10 weeks) (Molina & Borkovec, 1994). The PSWQ can be reliably used to identify individuals with generalized anxiety disorder (Fresco, Mennin, Heimberg & Turk, 2003; Behar, Alcaine, Zullig, & Borkovec, 2003).

The PSWQ has recently been established as a reliable and valid measure when administered over the Internet (Zlomke, 2009). Authors of a recent study found that when administered online the PSWQ demonstrated acceptable internal consistency (α =.73), and sufficient test-retest reliability (.67, $p < .001$). The authors note that this study gauged participants’ worries over the past week so a lower level of reliability

was expected. Construct validity was supported by significant correlations with stress ($r=.49$), anxiety ($r=.32$), and depression ($r=.28$) (Zlomke, 2009). The internal consistency coefficient alpha of the PSWQ for the present study ranged from .86 to .90.

Positive and Negative Affect. The 10-item Short Positive and Negative Affect Schedule (Short PANAS; Kercher, 1992; See Appendix G) was used to measure participants' positive and negative affect before and after each writing session. The Short PANAS is based on the original 20 item PANAS (Watson, Clark & Tellegen). The 10 item PANAS includes five positive emotions (alert, inspired, excited, enthusiastic, and determined) and five negative emotions (afraid, upset, nervous distressed, and scared). The directions of the Short Form PANAS instruct participants to choose the extent they currently feel each emotion. Each item is rated on a 5-point scale ranging from 1 (very slightly or not at all) to 5 (extremely).

Mackinnon et al. (1999) validated the Short Form PANAS for use with other populations by performing a confirmatory factor analysis on responses from a large community sample. The PA and NA scales in the short form are mostly independent, sharing a very small but significant proportion (1%) of variance. The scale also has acceptable internal consistency, with ($\alpha=.78$) for positive affect and ($\alpha=.87$) for negative affect (Mackinnon et al., 1999). Multiple group analyses revealed that the factor loadings did not vary by age of the participants. One item from the positive affect dimension, excited, may have some weaknesses in that there were some differential responses by age, marriage status, and education, and it cross-loads on the negative affect dimension ($\alpha=.24$). Nevertheless it has been determined that the short

form can be reliably used when researchers require brief measures of positive and negative affect (Mackinnon et al., 1999). The internal consistency coefficient alpha of the scales for the PANAS for the present study ranged from .85 to .91.

Mindfulness. Mindfulness was measured using the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006; See Appendix H). Baer et al. developed the FFMQ in response to the discrepancies in the literature related to the definitions of mindfulness. The FFMQ consists of 39 items, and respondents rate these items on a 5-point Likert-type scale ranging from 1 (never or very rarely true) to 5 (very often or almost always true). The FFMQ is scored by subscale, and higher scores reflect higher levels of mindfulness.

To develop the FFMQ, the authors conducted factor analyses using items from all available mindfulness questionnaires and found five distinct, related, underlying dimensions. Each of these dimensions, referred to as facets, contain the items from the previous scales found to have the highest factor loadings. These five facets, measured by the FFMQ, are: observing (example item: I notice the smells and aromas of things), describing (I'm good at finding words to describe my feelings), acting with awareness (I find myself doing things without paying attention – *reverse scored*), non-judging of inner experience (I think some of my emotions are bad or inappropriate and I shouldn't feel them – *reverse scored*), and non-reactivity to inner experience (I perceive my feelings and emotions without having to react to them).

Authors of the scale provided evidence of convergent validity showing subscales of the FFMQ show positive associations with self-compassion and openness to experience, and discriminant validity showing four of the five subscales

(all but observing) have negative associations with thought suppression, difficulties in psychological symptoms, regulating emotions, experiential avoidance, and absent-mindedness. The FFMQ has been shown to have good internal consistency ($\alpha=.92$; Sass et al., 2013).

Two of these facets, non-judgment of inner experience and non-reactivity to inner experience, were tested as moderators of the mindfulness intervention. The non-judgment facet has shown adequate internal consistency ($\alpha= .75$) and nonjudging has shown good internal consistency ($\alpha=.87$) (Baer et al., 2008). These facets are related ($r=.34$), but regression analyses in which each facets R^2 value from its alpha coefficient have shown most of the variance in each facet of the FFMQ as separate from the other four facets. The internal consistency coefficient alpha of the FFMQ for the present study ranged from .89 to .90.

Postpartum Depression. Depression was measured using the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987; See Appendix I). This scale is the most widely used scale for identifying postpartum depression. It consists of 10 questions related to the respondents' mood. Example items include "I have been able to laugh and see the funny side of things" (reverse scored) and "I have been anxious or worried for no good reason". Respondents rate the items on a four point Likert-type scale ranging from 0 (No, not at all) to 4 (Yes, quite a lot).

The split-half reliability of the EPDS found in the initial validation study was .87 (Cox et al., 1987). Sensitivity to change was established comparing scores at two different timepoints 11 weeks apart, as mothers who met diagnostic criteria at both timepoints showed now difference between their scores on the EPDS (both were

above the screening cutoff), and those who met diagnostic criteria at time 1 but not time 2 showed statistically significant decreases in the EPDS scores. Suggested optimal screening cutoffs suggested for the EPDS have ranged from 9-13, (Cox et al., 1987; Gibson, McKenzie-McHarg, Shakespeare, Price, & Gray, 2009; Ji et al., 2011). A cutoff of ≥ 9 is often used for possible depression, whereas ≥ 12 has been suggested for probable depression. The authors of the scale and the authors of a systematic review of validation studies (Gibson et al., 2009) suggest using ≥ 9 for first-stage screenings and to detect minor depression as well as major depression, and this is the cutoff that was used in this study. Among the studies with English speaking samples included in this review, sensitivity for detecting minor or major depression ranged from 59% (Beck & Gable, 2001) to 91% (Leverson & Elliott, 2000). Specificity ranged from 51% (Cox et al., 1987) to 86% (Beck & Gable, 2001). The internal consistency coefficient alpha of the FFMQ for the present study ranged from .80-.87.

Postpartum Physical and Psychological Wellbeing. The Mother's Postnatal Health Instrument (M-PHI; Jones, Morrell, Cooke, Speier, Anumba, Stewart-Brown, 2011; see Appendix J) was used to measure mother's postpartum wellbeing in eleven domains. This includes six "core scales" that are considered to relevant to all women who have recently given birth: Relationship with Baby, Social Support, Control Over Life, Mood, Role transition, and Sleep. Additionally, the instrument contains five "conditional scales" expected to only affect some women, including Relationship with my extended family, Breastfeeding, Physical Health Problems, Relationship with my Partner, and Sexual Relationship. The authors of the scale stress the importance of administering the entire scale and not separating the scales, and thus participants in

the present study had the opportunity to complete every item but skip those scales that are not relevant to their situation. For example, participants that responded that they did not breastfeed were able to skip breastfeeding scale. The M-PHI was developed and validated through a four-stage process that involved a focus group, qualitative interviews, a pilot survey and main survey and finally a test-retest survey administered one week later. Through this process the authors determined the internal reliability of the core scales ranged from .71 (Role Transition) to .86 (mood). The internal reliability of the conditional scales ranged from .66 (Breastfeeding) to .87 (Relationship with my Extended Family). The authors noted that all of the scales exceeded .70 with the exception of Sexual Relationships and Breastfeeding, and that these scales may have been influenced both by lower numbers of respondents as well as social pressures related feeling pressure to enjoy breastfeeding.

The core scales' one-week test-retest reliability alphas ranged from .67 (Sleep) and .88 (Relationship with Baby). The conditional scales' test-retest reliability was .73 for physical health problems, .76 for relationship with my partner, and .87 for relationship with extended family. There were not sufficient responses to gauge test-retest reliability for breastfeeding. Test-retest reliability for sexual relationship was low, (.04), and the authors note that there was considerable variation in responses at the item-level even in participants who stated there was no overall change, and note this subscale warrants further investigation.

The authors also determined the instrument's criterion validity of the M-PHI, with scales correlating in the expected directions with measures of similar constructs including depression (Edinburgh Postnatal Depression Scale; EPDS), health (Short-

Form-12; SF-12) and wellbeing (Warwick and Edinburgh Mental Well-Being Scale; WEMWBS). This instrument is notable because of its inclusion of assessment of positive aspects of the transition to parenthood.

Changes to this scale for the current study included the addition of the physical health subscale to the total for the core scales. Inter-scale reliability was examined with and without the physical health scale, and it was determined this alpha coefficient improved with the addition of the scale from .71 to .75. Each of the analyses in the study including this scale were done with and without the physical health scale included and it was determined that its inclusion did not change the pattern or significance of the results. Additionally, for this study the word “mum” was changed to “mom” in order to reflect terminology more commonly used in the United States. The internal consistency coefficient alphas for the individual scales at time 1 ranged from .70 (relationship with baby) to .84 (control over life). The internal consistency coefficient alphas for the individual scales at time 2 ranged from .68 (relationship with baby) to .86 (mood).

Positive and negative emotion words. The Linguistic Inquiry and Word Count (LIWC; Pennebaker, Booth, & Francis, 2007) was used to obtain the percentage of positive and negative words used by the participants. The LIWC is an online application designed to analyze a large number of categories of verbal and written speech. The category of words related to positive emotions, such as love, nice, and sweet, includes 406 words. The category of words related to negative emotions, such as hurt, ugly, and nasty, contains 499 words. Results are given as a percentage of total words entered.

Procedure

Participants were recruited primarily from local and national parenting and pregnancy listservs and websites that cater toward new mothers. Administrators of listservs and websites were contacted directly to request that the recruitment notice (Appendix A) be posted on the site or sent to members of the listserv, depending on the site. Example sites include arborparents@yahoogroups, austinmama.com, babycenter.com, Ballard Parents, Berkeley Parents Network, bostonmamas.com, bowerybabes.com, coloradomoms.com, Craigslist, dcurbanmom.com, craigslist, DFW area moms, FortGreene Kids, Golden Gate Mothers Group, momsmiami.com, Moms on the Hill, NE Seattle Moms, Moms on the Hill, Neighborhood Parents Network, circleofmoms.com, parentswithoutpartners.org, singleparentsnetwork.com, and phillyparentcircle.com. Participants were also recruited using the snowball method through faculty, staff and graduate student emails at the researcher's university.

The recruitment notice included a live link leading to a survey hosted by Qualtrics, an online survey software licensed by the researcher's university. After clicking on the link, participants were given the opportunity to complete the informed consent (see Appendix B) and answer questions related to inclusion criteria (see Appendix C). Participants who did not consent were taken to a screen that thanked them for their time. Participants who did not meet the inclusion criteria were taken immediately to a screen that thanked them for their interest, informed them that they did not qualify for the survey, and again provided them with contact information for the American Psychological Association's Psychologist Locator Service and the

National Suicide Prevention Lifeline. Eligible participants were asked for their preferred email address for future contact and then proceeded to complete demographic information (see Appendix D), baseline measures of postpartum wellbeing (see Appendix E), anxiety (see Appendix F), mindfulness (see Appendix G), and postpartum depression (see Appendix H). As participants responded to the study, they were assigned a number and randomly assigned to one of three conditions: mindfulness, self-affirmation, or waitlist control, using www.randomizer.org. Within one week participants received an email from newmotherhoodstudy@gmail.com. Once the participant responses were downloaded to an SPSS file from Qualtrics, the responses in Qualtrics were deleted. The email addresses were removed from the file and kept in a separate, password-protected file that also included the participant numbers. Participant data was thus attached only to the assigned numbers.

The email sent to the control condition (Appendix J) welcomed them to the study, informed them that they had been assigned to a waitlist condition, and contained a link to a brief survey related to expectations of improvement over the next month (see Appendix L.) Participants in the control condition were also told that they would have the opportunity to participate in the study in approximately five weeks. The emails sent to the two intervention conditions (see Appendix I) welcomed participants to the study and informed them that they were assigned to a writing condition (not a waitlist control condition). These emails contained links to three Qualtrics surveys, one for each writing session, and instructed participants to complete all three sessions within ten days, at least one day apart. They were also informed that if they did not complete the three sessions within ten days they would

no longer be considered an active participant in the study and thus were ineligible for the drawing. Before the first writing session participants in both writing conditions completed a survey related to their expectations of improvement (Appendix K).

In each of the three writing sessions, participants in the mindfulness condition completed an on-line writing exercise (Appendix N) that encouraged participants to observe and accept their thoughts and feelings surrounding being a mother without judging them. Participants were directed to write for fifteen minutes. They then again filled out the brief affect measure (Appendix M) and then a one-item manipulation check (Appendix O).

Before each of the three writing sessions, participants in the self-affirmation condition filled out the brief affect measure (Appendix M), completed a measure in which they ranked their values and characteristics, and then completed a writing exercise that asked them to consider how an important value has influenced their lives, both before and after becoming a mother (Appendix P). They then again filled out the brief affect measure (Appendix M) and then a one-item manipulation check (Appendix Q).

Participants in the writing conditions received two reminder emails asking them to complete all three writing sessions over the course of the ten-day period (see Appendices R and S). After completion of the third writing session, participants were reminded that they would be asked to complete one follow-up survey in the next 4-5 weeks. Weekly check-in emails were sent to all conditions (see Appendices T and U) over the next five weeks. Approximately seven weeks after the participants began the study, all participants were sent email with a link to a Qualtrics survey of follow-up

measures (see Appendices V and W). These were same measures taken by the participants at baseline, plus an additional survey regarding whether participants sought treatment related to physical or mental health during the study (Appendix X) The last page of the survey for the writing conditions debriefed the participants about the purpose of the study (see Appendix Z). The last page of the survey for the waitlist control condition (Appendix Y) informed them that they have finished the portion of the study required for entrance into the drawing. They were then given the opportunity to participate in the intervention. If they chose not to participate, they were taken directly to debriefing information. If they chose to participate they were taken to a page with directions and three links, one for each day of the intervention (Appendix A1). The type of intervention was randomly assigned. Participants were encouraged to save the page so that they would continue to have easy access to the interventions. All participants, regardless of condition, had their name entered into a drawing for one of five \$50 Amazon gift certificates. These were emailed to randomly selected participants after the data was collected. See Figure 3 for an outline of the study procedures.

Time 1 – All Participants

- Consent form and inclusion criteria
- Baseline questionnaires: demographics, EDPS, PSWQ, M-PHI, EDPS, FFMQ

Random assignment to conditions

- Emails with instructions to each condition

Self-Affirmation	Mindfulness	Waitlist Control
Time 2	Time 2	Time 2
<ul style="list-style-type: none"> • Expectations of improvement • SHORT PANAS • SVS and Self-Affirmation writing exercise. • SHORT PANAS 	<ul style="list-style-type: none"> • Expectations of improvement • SHORT PANAS • Mindfulness Writing Exercise • SHORT PANAS 	<ul style="list-style-type: none"> • Expectations of Improvement
Time 3	Time 3	*****
<ul style="list-style-type: none"> • SHORT PANAS • SVS and Self-Affirmation writing exercise. • SHORT PANAS 	<ul style="list-style-type: none"> • SHORT PANAS • Mindfulness Writing Exercise • SHORT PANAS 	<ul style="list-style-type: none"> • Check-in email • Check-in email • Check-in email • Check-in email • Check-in email
Time 4	Time 4	*****
<ul style="list-style-type: none"> • SHORT PANAS • SVS and Self-Affirmation writing exercise. • SHORT PANAS 	<ul style="list-style-type: none"> • SHORT PANAS • Mindfulness Writing Exercise • SHORT PANAS 	Time 3
*****	*****	• Follow-up Measures: PSWQ, FFMQ, M-PHI, EPDS
• Check-in email	• Check-in email	Time 4
*****	*****	• Email with link to intervention
• Check-in email	• Check-in email	Time 5
*****	*****	• Debriefing.
• Check-in email	• Check-in email	
*****	*****	
• Check-in email	• Check-in email	
*****	*****	
• Check-in email	• Check-in email	
*****	*****	
Time 5	Time 5	
<ul style="list-style-type: none"> • Follow-up Measures: PSWQ, FFMQ, M-PHI, EPDS, debriefing. 	<ul style="list-style-type: none"> • Follow-up Measures: PSWQ, FFMQ, M-PHI, EPDS, debriefing. 	

Figure 3: Overview of Procedure

Chapter 5: Results

Preliminary Analyses

In the following chapter, the results of all statistical analyses will be described, starting with details from the data screening process, attrition, and demographic information. Following this information are tables containing descriptive data for all variables of interest. Table 1 includes bivariate correlations for all main study variables, and Table 2 contains the means, standard deviations, possible and obtained ranges, and internal consistency of these variables. Table 3 contains the means and standard deviations by condition for all variables of interest. Following this section are the tests of hypotheses and additional analyses.

Attrition, missing data, and outliers. The rates of attrition were comparable to similar studies (e.g. Frattaroli, 2006), with 92% of the sample that began the online baseline measures completing them, and 59.08% of this group completing the final follow-up survey. The largest point of attrition was between the third writing session and the follow up for the two writing conditions and between the baseline and follow-up for the waitlist condition. Please see Figure 4 for an overview and details of the number of participants in each condition at each stage of the study. An examination of the scores on baseline measures showed that there was one statistically significant difference between those that did and did not complete the final follow-up survey; those that did complete the follow-up survey had a lower mean anxiety score as measured by the PSWQ ($p < .05$) than those that did not complete the follow-up survey. The two groups did not differ on measures of postpartum health, depression, or mindfulness.

Schlomer, Bauman, and Card (2010) recommend describing the amount, type, and pattern of missing data. When demographic data was excluded, a total of 2.05 % of the data was missing, excluding data lost to attrition. The results of Little's (1988) test, $\chi^2(419) = 487.74$, were insignificant at $p > .05$, indicating that the data was missing completely at random. To confirm there was no pattern of missing data for this particular measure, a dummy variable with two values (missing and nonmissing) was created, and independent sample t-tests were used to confirm that the missing data did not relate to any other variables of interest in this study. In conclusion, the dataset had a relatively small amount of missing data limited to a small number of cases. This missing data appeared to be at random and primarily due to the ordering of the measures in the survey. For analyses, missing data was addressed using listwise deletion, in which only complete cases were analyzed.

The data was examined for outliers. There were no notable outliers included in the demographic variables, with the exception of two cases that reported the age of their child to be over one year. These cases did not meet inclusion criteria and were thus discarded. Among the dependent variables, three relevant variables contained two values that could be considered outliers, time 1 mindfulness, time 1 nonreactivity, and time 1 nonjudgment. All analyses below were run with and without the cases that contained these outliers, and the same pattern of results occurred whether or not the cases were included. The analyses below retained these cases.

Before conducting the main analyses a p value of .05 was selected. This was chosen instead of using a familywise error correction due to concerns about Type II error, as previous meta-analyses have shown a range of small to medium effect sizes

for expressive writing interventions on psychological health outcome variables (Frattaroli, 2006; Smyth, 1998), and a number of the hypotheses in the current study address interaction effects, which tend to be small.

Expectations of Improvement.

Expectations of improvement have been found to influence treatment outcomes (e.g. Borkovec & Costello, 1993) and thus it is recommended that researchers assess for any differing expectations of improvement in comparison groups. In this study, the mean score on the expectations of improvement measure was similar between the Mindfulness (M=17.71, SD=4.86), Self-Affirmation, (M=17.16, SD=6.63), and Waitlist (M=18.68, SD=2.83), conditions. Three independent sample t-tests were run to confirm that none of the differences were significant at the $p < .05$ level.

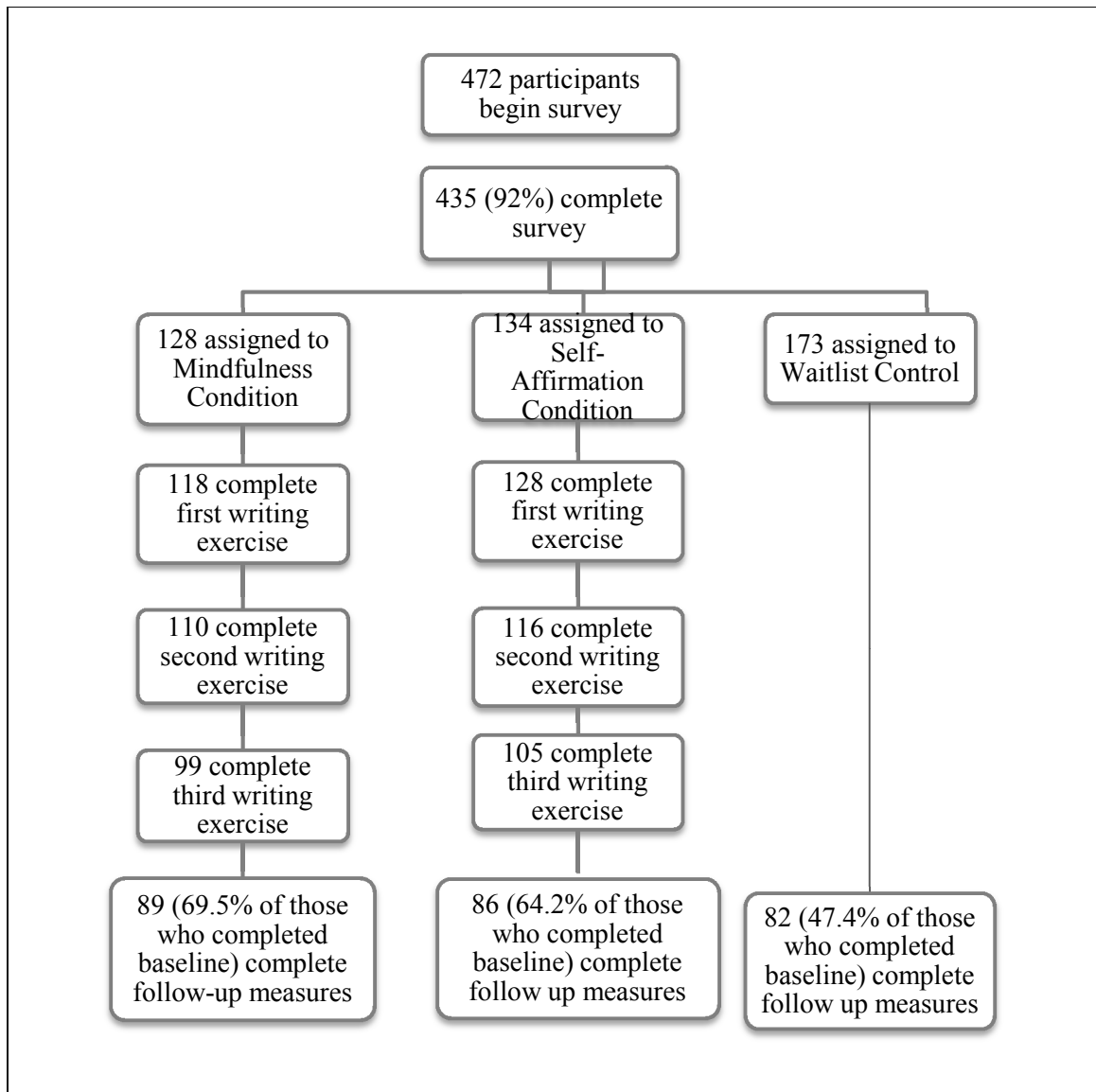


Figure 4. Number of participants at each stage of study

Table 1 Correlations Between all Variables of Interest

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. EXPECT ¹	1																				
2. POSWORDS ²	.33**	1																			
3. NEGWORDS ³	-.10	-.31**	1																		
4. PREPOSPAN ⁴	.31**	.65**	-.43**	1																	
5. POSTPOSPAN ⁵	.34**	.58**	-.39**	.84**	1																
6. PRENEGSPAN ⁶	.14	-.37**	.43**	.01	.14	1															
7. POSTNEGSPAN ⁷	-.12	-.29**	.41**	-.07	.00	.80**	1														
8. MANIP ⁸	-.19*	.29**	-.26**	.20**	.12	-.08	.03	1													
9. T1DEP ⁹	.07	-.18*	.10	-.02	.07	.44**	.36**	.09	1												
10. T2DEP ¹⁰	-.03	-.02	.12	.13	.16*	.47**	.50**	.35**	.66**	1											
11. T1WORRY ¹¹	.08	-.25**	.37**	-.06	-.17*	.42**	.52**	.09	.48**	.37**	1										
12. T2WORRY ¹²	-.03	-.34**	.42**	-.13	-.26**	.51**	.63**	-.03	.51**	.49**	.70**	1									
13. T1PHYS ¹³	.22**	.06	.13	.22**	.28**	.35**	.25**	-.23**	.03	-.07	.13*	.07	1								
14. T2PHYS ¹⁴	.22**	.03	.11	.21**	.30**	.34**	.20*	-.29**	.03	-.07	.02	.05	.95**	1							
15. T1MPHSUM ¹⁵	.24**	.02	.12	.09	.19*	.28**	.08	-.23**	-.06	-.07	-.05	-.02	.79**	.83**	1						
16. T2MPHSUM ¹⁶	.21**	.06	.07	.18*	.23**	.23*	.07	-.15	-.11*	-.16*	.03	-.01	.73**	.77**	.88**	1					
17. T1NONREACT ¹⁷	.16*	.15	-.30**	.09	.16*	-.28**	-.61**	-.24**	-.45**	-.47**	-.49**	-.53**	-.12	-.05	.15*	.16**	1				
18. T1NONJUDGE ¹⁸	.02	-.20**	-.05	-.03	.02	-.13	-.41**	-.50**	-.38**	-.47**	-.49**	-.42**	.09	.14*	.06	-.02	.36**	1			
19. T2NONREACT ¹⁹	.21**	.22**	-.31**	.21**	.38**	-.05	-.30**	-.26**	-.24**	-.31**	-.37**	-.37**	.08	.18**	.20**	.30*	.65**	.16*	1		
20. T2NONJUDGE ²⁰	.07	-.01	-.26**	.1	.23**	-.05	-.38**	-.36**	-.05	-.27**	-.42**	-.39**	.06	.15*	.08	.03	.21**	.64**	.49**	1	
21. T1MINDFUL ²¹	.06	-.14	-.16*	.03	.15*	-.15*	-.46**	-.54**	-.32**	-.37**	-.57**	-.53**	.12	.19**	.22**	.11	.65**	.79**	.36**	.49**	1
22. T2MINDFUL ²²	.30**	.08	-.22**	.26**	.42**	.13	-.21**	-.40**	-.08	-.22**	-.41**	-.32**	.20*	.31**	.28**	.24**	.47**	.48**	.74**	.80**	.63**

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

¹ Expectations of Improvement, ² Mean Percentage of Positive Words in Writing Sample, ³ Mean Percentage of Negative Words in Writing Sample, ⁴ Sum of Pre-Intervention PANAS Positive Affect ⁵ Sum of Post-Intervention PANAS Positive Affect, ⁶ Sum of Pre-Intervention PANAS Negative Affect ⁷ Sum of Post-Intervention Negative Affect, ⁸ Manipulation Check, ⁹ Time 1 Depression, ¹⁰ Time 2 Depression, ¹¹ Time 1 Worry, ¹² Time 2 Worry, ¹³ Time 1 Physical Health, ¹⁴ Time 2 Physical Health, ¹⁵ Time 1 General Postnatal Health, ¹⁶ Time 2 General Postnatal Health, ¹⁷ Time 1 FFMQ Nonreact scale, ¹⁸ Time 1 FFMQ Nonjudgement scale, ¹⁹ Time 2 FFMQ Nonreact Scale, ²⁰ Time 2 FFMQ Nonjudge, ²¹ Time 1 FFMQ Mindfulness Sum, ²² Time 2 FFMQ Mindfulness

Table 2. Means, Standard Deviations, Obtained and Possible Ranges and Reliability for all Variables of Interest

Variable	Mean	Standard Deviation	Obtained range	Possible range	Reliability
EXPECT ¹	17.99	5.51	4-28	4-36	0.91
POSWORDS ²	3.42	0.62	2.38-5.34	N/A	N/A
NEGWORDS ³	1.47	0.61	.52-2.91	N/A	N/A
PREPOSPAN ⁴	39.54	12.39	20-75	15-75	.85-.91
POSTPOSPAN ⁵	29.49	11.90	15-60		
PRENEGSPAN ⁶	21.09	7.62	15-45	15-75	.75-.92
POSTNEGSPAN ⁷	21.59	7.44	15-40		
MANIP ⁸	3.93	.82	2-5	0-5	N/A
T1DEP ⁹	7.40	3.29	2-19	0-30	.79-.87
T2DEP ¹⁰	7.30	2.92	3-13		
T1ANX ¹¹	47.56	10.32	24-66	16-80	.86-.90
T2ANX ¹²	48.03	12.74	26-71		
T1PHYS ¹³	28.31	11.14	0-47	0-100	0.69
T2PHYS ¹⁴	28.04	11.40	0-47	0-100	0.73
T1MPHSUM ¹⁵	144.46	46.29	45-223	0-700	.68-86
T2MPHSUM ¹⁶	163.59	44.99	70-270		
T1NONREACT ¹⁷	21.77	3.99	13-30	7-35	0.77
T1NONJUDGE ¹⁸	29.27	6.35	11-40	8-40	0.89
T2NONREACT ¹⁹	21.38	4.29	14-30	7-35	0.78
T2NONJUDGE ²⁰	29.20	6.73	17-40	8-40	0.89
T1MINDFUL ²¹	130.81	17.06	75-163	39-195	0.89
T2MINDFUL ²²	131.41	17.49	92-163	39-195	0.89

¹ Expectations of Improvement, ² Mean Percentage of Positive Words in Writing Sample, ³ Mean Percentage of Negative Words in Writing Sample, ⁴ Sum of Pre-Intervention PANAS Positive Affect ⁵ Sum of Post-Intervention PANAS Positive Affect, ⁶ Sum of Pre-Intervention PANAS Negative Affect ⁷ Sum of Post-Intervention Negative Affect, ⁸ Manipulation Check, ⁹ Time 1 Depression, ¹⁰ Time 2 Depression, ¹¹ Time 1 Anxiety, ¹² Time 2 Anxiety, ¹³ Time 1 Physical Health, ¹⁴ Time 2 Physical Health, ¹⁵ Time 1 General Postnatal Health, ¹⁶ Time 2 General Postnatal Health, ¹⁷ Time 1 FFMQ Nonreact scale, ¹⁸ Time 1 FFMQ Nonjudgement scale, ¹⁹ Time 2 FFMQ Nonreact Scale, ²⁰ Time 2 FFMQ Nonjudge, ²¹ Time 1 FFMQ Mindfulness Sum, ²² Time 2 FFMQ Mindfulness, Sum.

Table 3. Means and Standard Deviations by Condition for all Variables of Interest.

Variable	Condition					
	Mindfulness		Self-Affirmation		Waitlist	
	Mean	SD	Mean	SD	Mean	SD
EXPECT ¹	17.71	4.86	17.16	6.63	18.68	2.83
POSWORDS ²	3.49	0.73	3.26	0.42	N/A	N/A
NEGWORDS ³	1.89	0.65	1.13	0.32	N/A	N/A
PREPOSPAN ⁴	38.25	11.74	37.63	8.49	N/A	N/A
POSTPOSPAN ⁵	28.49	10.18	28.57	11.54	N/A	N/A
PRENEGSPAN ⁶	21.59	6.50	20.98	8.80	N/A	N/A
POSTNEGSPAN ⁷	21.48	7.61	22.13	7.49	N/A	N/A
MANIP ⁸	3.97	.91	3.94	.67	N/A	N/A
T1DEP ⁹	7.27	2.97	7.66	3.92	7.27	2.9
T2DEP ¹⁰	7.83	3.25	6.71	2.92	7.33	2.43
T1ANX ¹¹	47.96	10.38	46.45	11.07	48.29	9.42
T2ANX ¹²	49.93	13.49	4.00	16.10	45.38	5.61
T1PHYS ¹³	28.82	13.84	26.13	9.87	30.04	8.58
T2PHYS ¹⁴	28.40	14.22	26.49	10.99	29.26	7.75
T1MPHSUM ¹⁵	138.63	44.69	140.81	58.52	154.62	29.19
T2MPHSUM ¹⁶	158.20	36.83	162.84	62.72	170.22	26.86
T1NONREACT ¹⁷	21.72	4.01	22.56	4.64	21.00	3.03
T1NONJUDGE ¹⁸	31.44	3.68	28.57	8.66	27.66	5.06
T2NONREACT ¹⁹	21.39	4.07	23.53	4.44	19.09	3.04
T2NONJUDGE ²⁰	30.00	5.84	31.93	7.25	25.46	5.31
T1MINDFUL ²¹	131.97	12.36	130.46	24.5	129.9	11.04
T2MINDFUL ²²	132.61	15.87	138.72	21.11	122.44	9.23

¹ Expectations of Improvement, ² Mean Percentage of Positive Words in Writing Sample, ³ Mean Percentage of Negative Words in Writing Sample, ⁴ Sum of Pre-Intervention PANAS Positive Affect ⁵ Sum of Post-Intervention PANAS Positive Affect, ⁶ Sum of Pre-Intervention PANAS Negative Affect ⁷ Sum of Post-Intervention Negative Affect, ⁸ Manipulation Check, ⁹ Time 1 Depression, ¹⁰ Time 2 Depression, ¹¹ Time 1 Anxiety, ¹² Time 2 Anxiety, ¹³ Time 1 Physical Health, ¹⁴ Time 2 Physical Health, ¹⁵ Time 1 General Postnatal Health, ¹⁶ Time 2 General Postnatal Health, ¹⁷ Time 1 FFMQ Nonreact scale, ¹⁸ Time 1 FFMQ Nonjudgement scale, ¹⁹ Time 2 FFMQ Nonreact Scale, ²⁰ Time 2 FFMQ Nonjudge, ²¹ Time 1 FFMQ Mindfulness Sum, ²² Time 2 FFMQ Mindfulness Sum.

Manipulation Checks

Two types of manipulation checks were used in the study. Writing samples were independently coded and categorized by two trained coders by condition (self-affirmation or mindfulness) based on content. The coders agreed on 174 out of 175 writing samples, with one sample from the self-affirmation condition coded by one coder as being in the mindfulness condition. This level of agreement results in a Cohen's Kappa of ($k=.99$), surpassing the pre-established cutoff of .75, which has been suggested to indicate an excellent agreement beyond chance (Landis & Koch, 1977). The second check was the one-item scale completed by participants in both conditions. Results were similar in the two conditions, with those in the mindfulness condition reporting a mean of 3.96 ($SD=.91$), and those in the self-affirmation condition reporting a mean of 3.94 ($SD=.67$), indicating participants in both conditions reported attempting to abide by the writing instructions over half the time.

Tests of Hypotheses

Hypotheses 1. Hypotheses 1a and 1b relate to the percentage of positive and negative words participants used in their writing exercises. To confirm any group differences in mean negative or emotion words were not confounded by group differences in how many words participants wrote, an independent samples t-test was run and it was determined that the conditions did not differ significantly on this variable, ($t(173)=-.030, p>.05$).

Using the Linguistic Inquiry and Word Count (LIWC; Pennebaker et. al, 2001) the percentage of total words that describe positive and negative emotions within each writing sample was calculated, and this was averaged to create a mean

percentage of negative words and a mean percentage of positive words. An independent t-test was run to test the differences in the mean percentage of negative emotion words between the mindfulness and self-affirmation conditions. Participants in the mindfulness condition ($M=1.89$, $SD =.65$), had a significantly higher percentage of negative emotion words in their writing samples than participants in the Self-Affirmation condition ($M=1.13$, $SD =.32$). The results were statistically significant, supporting hypothesis 1a ($t(173)=8.68$, $p = .00$, $CI=.52-.82$) Using Cohen's 1988 conventions, this effect size for this difference ($d=1.4$), can be interpreted as large.

The results of another independent samples t-test revealed participants in the mindfulness condition ($M=3.56$, $SD =.73$), used significantly more positive emotion words in their writing samples than participants in the Self-Affirmation condition ($M=3.26$, $SD =.42$), and that this difference was statistically significant, supporting hypothesis 1b ($t(173)=3.43$, $p <.05$, $CI=.13-.49$,). Using Cohen's 1988 conventions, the effect size for this difference ($d=.52$) can be interpreted as medium. A review of the mean percentage of positive and negative emotion words in the individual writing sessions shows participants in the mindfulness condition used a higher percentage of negative words than those in the self-affirmation condition in all three writing sessions, and participants in the self-affirmation condition used a higher percentage of positive words than those in the mindfulness condition in the first writing session.

Hypothesis 2. Hypothesis 2 stated that participants in the experimental conditions will report: (2a) lower levels of outcome depression as measured by the Edinburgh Postnatal Depression Survey, (2b) lower levels of outcome anxiety as

measured by the Penn State Worry Questionnaire at follow up than those in the waitlist control condition and (2c) fewer complaints with regard to psychological and physical wellbeing as measured by the M-PHI at follow up than those in the waitlist control condition. ANOVAs were used to confirm that there was no significant difference between writing and waitlist on any of the baseline measures ($p < .05$). There is much debate in the literature about how to appropriately analyze pretest-posttest designs. Some experts have recommended ANCOVA over gain scores, noting that using gain scores can overcorrect the posttest score by the pretest score (Cohen, Cohen, West, & Aiken, 2003). Other authors have pointed out that gain scores are problematic for studies that are not randomized. In studies with randomly assigned groups the outcomes of the analyses should be substantively the same (Maxwell & Delaney, 1990). In their discussion of how to measure pretest-posttest data, Fitzmaurice, Laird, and Ware (2004) concluded that the only situation in which they would recommend ANCOVA over gain scores is with longitudinal data from a randomized trial. Since this describes the current study, ANCOVA was used to analyze both the main effects and the interactions. If the results of the ANCOVAs indicated the data did not meet the assumption of equality of slopes, in other words the association between the independent variable and the dependent variable varied depending on the covariate, regression analyses were used as recommended West, Aiken, and Krull (1996). To prepare for testing these hypotheses, condition was contrast coded as 1/3, 1/3, -2/3 to compare the mean of the treatment groups with the control group. These codes follow the guidelines for contrast codes outlined by Cohen, Cohen, West, and Aiken (2003).

2a. An ANCOVA was run for the outcome measure of depression with the centered pre-test score as the covariate and condition as the predictor. In order to ascertain whether the data met the assumption of equality of slopes, a second step containing an interaction term of the contrast code for writing vs. waitlist by time 1 depression score was entered. This term was not significant ($d > .05$). Since the term was not significant, the ANCOVA was run again without the interaction term. The covariate, pretest scores on depression, was significantly related to the follow-up depression score, $F(1, 254) = 196.037, p < .05$. The difference between the adjusted means of the treatment groups and the waitlist group was not significant, $F(1, 254) = .306, p > .05$. Thus, the results did not support the hypothesis.

2b. An ANCOVA was run for the outcome measure of anxiety with the centered pre-test score as the covariate and condition as the predictor. Again, a second step tested for an interaction between writing vs. waitlist and time 1 anxiety. This term was significant $F(1, 253) = 376.76, p < .05$. The significance of this interaction indicates that this data did not meet the assumption of equality of slopes. In order to obtain a more accurate picture of the data a regression was run with the baseline score on the PSWQ entered as a moderator. The contrast code was multiplied by the centered baseline anxiety score representing the interaction between the predictor (condition) and the moderator (baseline score on PSWQ). The squared semipartial correlations between the variables of interest were examined for each of the variables to ascertain the effect size. The effect of condition was statistically significant at $p < .01$, with a squared semipartial correlation of .023, though this was not in the expected direction. Thus, the results did not support the hypothesis.

Although the overall hypothesis was not supported, the interaction between condition and baseline score of anxiety was also significant, $\Delta R^2 = .29$, $F(3,256) = 352.45$, $p < .05$. Simple slopes analyses (Frazier, Tix, & Barron, 2004) were conducted to fully understand the data. The relationship between baseline anxiety and follow up anxiety differed depending on condition. There was a significant positive association for those in the writing condition ($B=1.24$, $p < .05$), but a significant negative association for those in the waitlist condition ($B=-.17$, $p < .05$).

In order to obtain a visual understanding of the practical significance of this result, predicted values for the scores on the follow-up PSWQ at one standard deviation above and below the mean worry score was plotted according to the suggestion of Cohen (2003) (see Figure 5). The mean baseline PSWQ score was 47.56, with a standard deviation of 10.32. A score of 45 has been reliably used as screening cutoff score for anxiety symptoms (Behar, Alcaine, Zuellig, & Borkovec, 2003), meaning that those one standard deviation above and below the mean would also be above and below this cutoff, respectively. Studies of similar populations of postpartum women have found similar means (e.g. Getch, 2011).

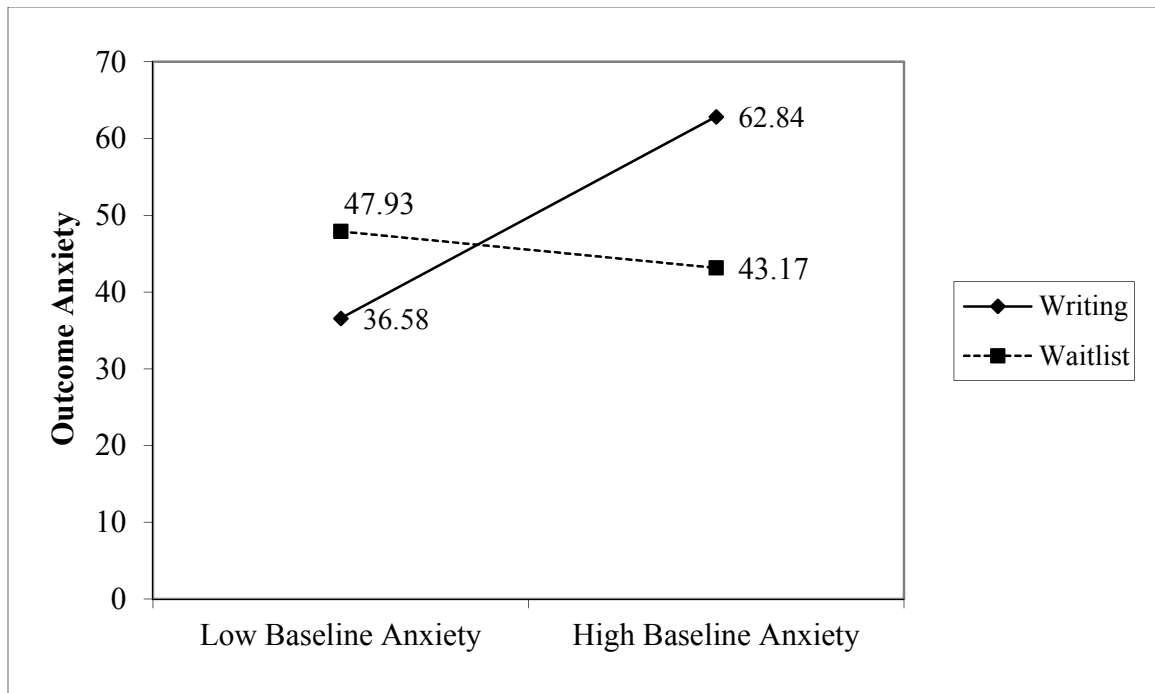


Figure 5. Interaction effect between baseline anxiety (measured by PSWQ) and condition on follow-up anxiety. Values used for low and high baseline anxiety were 37.18 and 57.94

2c. An ANCOVA was run for the outcome measure of postnatal health (the M-PHI) with the centered pre-test score as the covariate and condition as the predictor. In order to ascertain whether the data met the assumption of equality of slopes, a third step containing an interaction term of the contrast code for writing vs. waitlist by time 1 M-PHI score was entered. This term was not significant, $F(1,253) = .245, p > .05$. Since the term was not significant, the ANCOVA was run again without the interaction term. The difference between the mean of the treatment groups and the waitlist group was not significant, $F(1,254) = 1.081, p > .05$, and as expected pretest

scores on postnatal health were significantly related to the follow-up postnatal health score, $F(1, 254) = 839.24, p < .05$. Thus, the results did not support the hypothesis.

Hypothesis 3a.

The relationship between writing condition and follow-up depression will be moderated by baseline levels of nonreactivity to inner experiences such that, controlling for baseline depression scores, for those in the mindfulness condition the more reactive to their inner experiences they are (i.e. the lower their scores are on the nonreactivity to inner experience subscale of the FFMQ) the higher their outcome depression scores will be, whereas for those in the self-affirmation condition outcome depression scores will not differ as a function of baseline nonreactivity.

An ANCOVA was run for the outcome measure of depression with the centered pre-test score as the covariate and condition and time 1 nonreactivity as the predictors. The condition variable was contrast coded using the values .5, -5, and -0, according to Cohen, Cohen, Aiken, and West (2003) to compare the two treatment groups. The interaction terms were all statistically significant at $p < .05$, including nonreactivity and condition, $F(5,217) = 21.749, p < .05$, depression and condition, $F(2,217) = 4.532, p < .05$, depression and nonreactivity, $F(12,217) = 6.39, p < .05$, and the three-way interaction between nonreactivity, condition, and depression $F(5,217) = 4.18, p < .05$. The significance of the interaction between baseline depression, condition, and baseline nonreactivity indicated that this data did not meet the criteria for the assumption of homogeneity of slopes. In order to obtain a clearer picture of the data, a moderated regression was run (see Table 4).

As can be seen in the table, the interaction between type of writing condition and nonreactivity was not significant ($B = -.02$, $SEB = .09$, $p > .05$), thus the overall hypothesis was not supported. However, since all the other relationships were significant, simple slopes analyses (Frazier et al., 2004), were conducted to fully understand the data. The slopes were analyzed at low, medium, and high (for the sample) levels of depression and nonreactivity. For the low level of baseline depression, one standard deviation below the mean (4.11) was used. For the high level of depression, one standard deviation above the mean was used (10.69).

Results indicated that those who were more reactive to their inner experiences averaged higher follow-up depression scores in the mindfulness condition than the self-affirmation condition across all levels of baseline depression, though this was only statistically significant for those who started out at mean (for the study) levels of depression ($B = 1.14$, $SEB = .50$, $t(246) = 2.26$, $p < .05$.)

Those who were less reactive to their inner experiences also averaged higher follow-up depression scores in the mindfulness condition than the self-affirmation condition at low to mean (for the study) baseline levels of depression, though this was only statistically significant at low levels of depression ($B = 2.89$, $SEB = .48$, $t(246) = 3$, $p < .05$). This group also experienced a mean increase in depression levels in the mindfulness condition.

Those who were less reactive to their inner experiences but high in baseline depression scores averaged lower depression scores in the mindfulness condition than the self-affirmation condition at follow up, though this result was not statistically significant ($B = -.98$, $SEB = .89$, $t(246) = -1.11$, $p > .05$). This group also had a

decrease in depression levels from baseline to follow up in both writing conditions.

To obtain a visual understanding of the results, the predicted values at these high and low levels of baseline depression and nonreactivity were also plotted (See Figure 6).

Table 4. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Depression Scores from Baseline Depression, Baseline Nonreactivity, and Type of Writing Condition

Predictors		<i>B</i>	<i>SEB</i>	<i>Df</i>	ΔF	R^2	ΔR^2	<i>p</i>	sr^2
Step 1				253	85.44	.50	.50	.00	
	Time 1 Depression*	.47	.04					.00	.20
	Time 1 Nonreactivity*	-.17	.04					.00	.04
	Condition**	1.05	.34					.00	.02
Step 2				250	7.18	.54	.04	.00	
	ConditionXNonreactivity	-.02	.09					.79	
	DepressionXNonreactivity	-.03	.01					.00	.01
	ConditionXDepression	-.31	.10					.00	.02
Step 3				249	5.48	.55	.01	.00	
	ConditionXDepressionXNonreactivity	-.07	.03					.02	.01

Note. sr^2 = the squared semipartial correlations indicate the unique variance predicted by the independent variable

*Variable Centered before Analysis

**Condition Contrast Coded Using Values .5, -.5, 0 for Mindfulness vs. Self-Affirmation

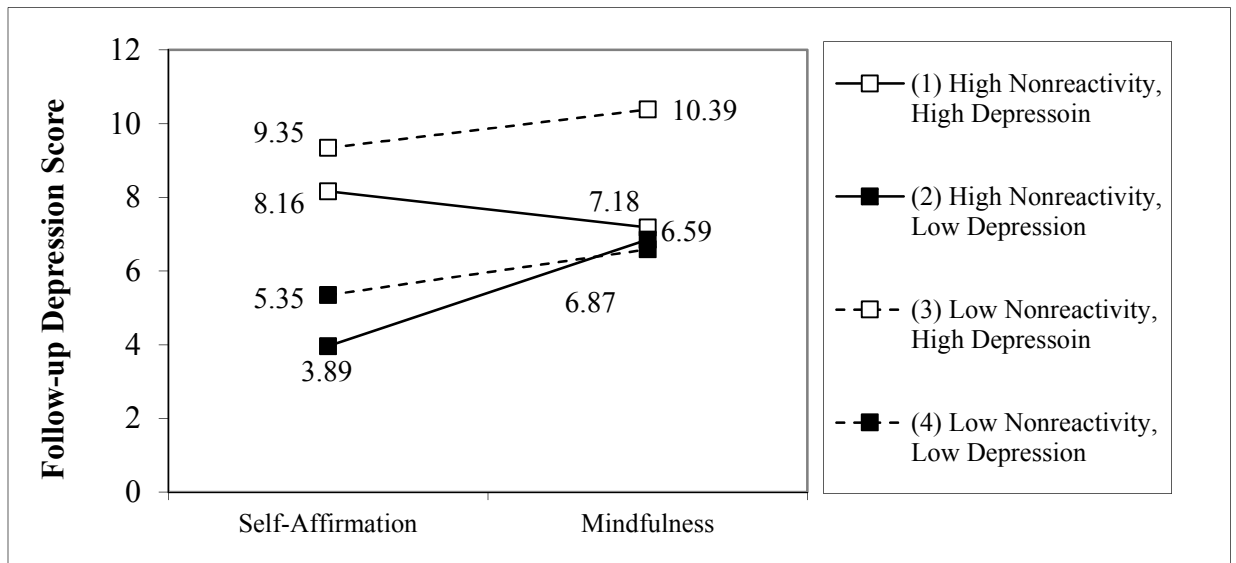


Figure 6. Interaction effect between baseline depression (measured by EPDS) and condition on follow-up depression score. Low depression = 4.11, High Depression = 10.6

Hypothesis 3b. The relationship between writing condition and follow-up anxiety will be moderated by baseline levels of nonreactivity to inner experiences such that, controlling for baseline levels of anxiety, for those in the mindfulness condition the more reactive to their inner experiences they are (i.e. the lower their scores are on the nonreactivity to inner experience subscale of the FFMQ) the higher their outcome anxiety scores will be, whereas for those in the self-affirmation condition outcome anxiety scores will not differ as a function of baseline nonreactivity.

An ANCOVA was run for the outcome measure of anxiety with the centered pre-test score as the covariate and contrast code for condition and time 1 nonreactivity as the predictors, as well as all possible interactions. The interaction terms containing the covariate were examined to see if the data met the criteria for the assumption of homogeneity of slopes. The interaction term for worry and condition was significant ($F(2, 217)=8.06, p<.005$). Thus, the data did not meet the criteria for this assumption. In order to further analyze the data, a moderated regression was run (See Table 5).

As can be seen in the table, the interaction between type of writing condition and nonreactivity was not significant ($B=.34, SEB=.38, p > .05$), not supporting the overall hypothesis. The three-way interaction between anxiety, nonreactivity, and condition, was significant ($B= .11, SEB = .04, p<.05$), and simple slopes analyses (Frazier et al., 2004), were conducted to fully understand the data. The slopes were analyzed at low, medium, and high (for the sample) levels of anxiety and nonreactivity. One standard deviation below and above the mean were used as low

and high values of anxiety. Results from the slopes test indicated that there was a significant difference for only one combination of baseline anxiety and nonreactivity, high anxiety/low nonreactivity ($B = -6.71$, $SEB = 2.47$, $t(246) = -2.71$, $p < .05$). Hence, those who were high in anxiety and more reactive to their inner experiences averaged lower scores of anxiety in the mindfulness condition than the self-affirmation condition. Follow-up scores for this group were similar to baseline scores, though there was a slight increase in the self-affirmation condition and a decrease in the mindfulness condition. Conversely, those who were *low* in anxiety and low in nonreactivity had higher anxiety scores in the mindfulness condition though this result did not meet statistical significance ($B = 7.01$, $SEB = 4.64$, $t(246) = 1.51$, $p > .05$). This group had mean increases in follow-up anxiety when compared to baseline in both conditions. To obtain a visual understanding of the results, the predicted values at these high and low levels of baseline anxiety and nonreactivity were also plotted (See Figure 7).

Table 5. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Anxiety Scores from Baseline Anxiety, Baseline Nonreactivity, and Type of Writing Condition

	Predictors	<i>B</i>	<i>SEB</i>	<i>df</i>	ΔF	R^2	ΔR^2	<i>p</i>	sr^{2b}
Step 1				253	96.38	.26	.53	.00	
	Time 1 Anxiety*	.67	.06					.00	.21
	Time 1 Nonreactivity*	-.68	.17					.00	.03
	Condition**	1.5	1.74					.39	
Step 2				250	2.24	.55	.01		
	ConditionXNonreactivity	.34	.38					.38	
	AnxietyXNonreactivity	.05	.02					.38	
	ConditionXAnxiety	-.23	.15					.15	
Step 3				249	6.36	.56	.01		
	ConditionXAnxietyXNonreactivity	.11	.04					.01	.01

Note. sr^2 = the squared semipartial correlations indicate the unique variance predicted by the independent variable

*Variable Centered before Analysis

**Condition Contrast Coded Using Values .5, -.5, 0 for Mindfulness vs. Self-Affirmation

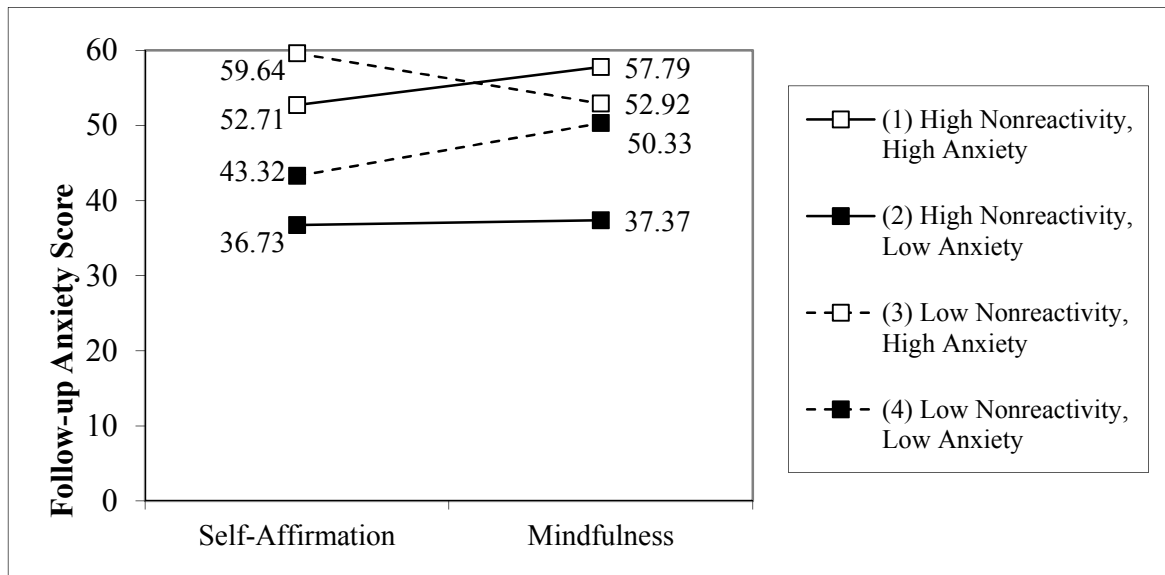


Figure 7. Interaction effect between baseline depression (measured by PSWQ) and condition on follow-up anxiety score. Low baseline anxiety = 37.18, high baseline anxiety = 57.94.

Hypothesis 3c. The relationship between writing condition and follow-up well-being will be moderated by baseline levels of nonreactivity to inner experiences such that, controlling for baseline levels of wellbeing, for those in the mindfulness condition the more reactive to their inner experiences they are (i.e. the lower their scores are on the nonreactivity to inner experience subscale of the FFMQ) the more complaints related to wellbeing they will report at outcome, whereas for those in the self-affirmation condition outcome complaints related to wellbeing will not differ as a function of baseline nonreactivity.

An ANCOVA was run for the outcome measure of postpartum wellbeing with the centered pre-test score as the covariate and contrast code for condition and time 1

nonreactivity as the predictors, as well as all possible interactions. The interaction terms containing the covariate were examined to see if the data met the criteria for the assumption of homogeneity of slopes. All interaction terms containing the covariate were significant ($p < .05$), meaning the data did not meet the criteria for this assumption. To further analyze the data, a moderated regression was run (See Table 6).

As can be seen in the table, the interaction between type of writing condition and nonreactivity was not significant, failing to support the overall hypothesis. However, the interaction between condition and wellbeing complaints ($B = -.32$, $SEB = .06$, $p < .05$ $sr^2 = .02$), wellbeing complaints and nonreactivity ($B = -.02$, $SEB = .01$, $p < .05$ $sr^2 = .004$), and type of writing condition, nonreactivity, and baseline wellbeing complaints ($B = .02$, $SEB = .02$, $p < .05$ $sr^2 = .001$) were significant. Simple slopes analyses (Frazier et al., 2004), were conducted to fully understand the data. The slopes were analyzed at the mean, as well as one standard deviation below and above the mean for levels of complaints related to wellbeing and nonreactivity.

Those with more baseline postpartum wellbeing complaints averaged more complaints at follow up in the self-affirmation condition than the mindfulness condition across all levels of nonreactivity (high: $B = -17.69$, $SEB = 5.76$, $t(246) = -3.07$, $p < .05$; low: $B = -27.78$, $SEB = 6.63$, $t(246) = -4.19$, $p < .05$). The same pattern existed at mean levels of postnatal wellbeing, though this only reached significance at mean levels of nonreactivity ($B = -7.83$, $SEB = 3.36$, $t(246) = -3.36$, $p < .05$.) Conversely, those with fewer postnatal wellbeing complaints averaged more complaints at follow-up in the mindfulness condition than the self-affirmation

condition though this only reached significance for those with low levels of nonreactivity (who were more reactive to their inner experience) ($B = 10.16$, $SEB = 4.86$, $t(246) = 2.09$, $p < .05$). At low levels of baseline postpartum wellbeing complaints, there was a mean increase at follow up in both conditions, whereas at high levels there was only an increase from baseline to follow-up in the self-affirmation condition. To obtain a visual understanding of the results, the predicted values at low and high levels of postpartum health and nonreactivity were also plotted (See Figure 8).

Table 6. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Postpartum Wellbeing Scores from Baseline Postpartum Wellbeing, Baseline Nonreactivity, and Type of Writing Condition

Predictors		<i>B</i>	<i>SEB</i>	<i>df</i>	ΔF	R^2	ΔR^2	<i>p</i>	sr^2
Step 1				253	283.74	.77	.77	.00	
	Time 1 Postpartum Wellbeing Complaints*	.82	.03					.00	.63
	Time 1 Nonreactivity* Condition**	-.382	.36					.29	
		-7.83	3.37					.02	.00
Step 2				250	11.24	.80	.03		
	ConditionXNonreactivity	.25	.79					.76	
	WellbeingXNonreactivity	-.02	.01					.03	.00
	ConditionXWellbeing	-.32	.06					.00	.02
Step 3				249	1.83	.80	.001		
	ConditionXWellbeingXNonreactivity	.02	.02					.12	.00

Note. sr^2 = the squared semipartial correlations indicate the unique variance predicted by the independent variable

*Variable Centered before Analysis

**Condition Contrast Coded Using Values .5, -.5, 0 for Mindfulness vs. Self-Affirmation

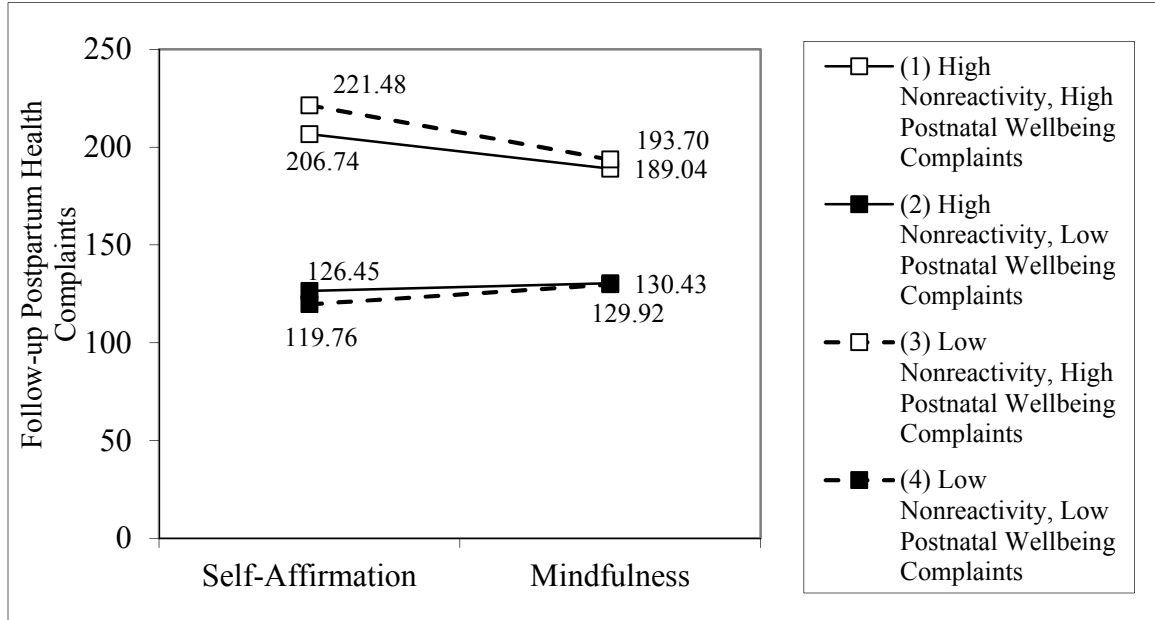


Figure 8. Interaction effect between baseline wellbeing, baseline nonreactivity, and condition on follow-up postpartum wellbeing. Low and high values of baseline MPH-I used were one standard deviation below and above the mean (98.18, 190.75). Lower scores on postpartum health complaints scale indicate higher postpartum wellbeing.

Hypothesis 3d. The relationship between writing condition and follow-up depression will be moderated by baseline levels of nonjudgment of inner experiences such that, controlling for baseline depression scores, for those in the mindfulness condition the more judgmental of their inner experiences they are (i.e. the lower their scores are on the nonjudgment of inner experience subscale of the FFMQ) the higher their outcome depression scores will be, whereas for those in the self-affirmation condition outcome depression scores will not differ as a function of baseline nonjudgment. An ANCOVA was run for the outcome measure of depression with the centered pre-test score as the covariate and baseline nonjudgment and contrast code

for condition as the predictors. The interaction terms containing the covariate were examined to see if the data met the criteria for the assumption of homogeneity of slopes. The three relevant interaction terms were all statistically significant at the $p < .05$ level. The significance of these terms indicated that the this data did not meet the criteria for the assumption of homogeneity of slopes, in other words the influence of nonjudgment and condition on outcome depression scores varies depending on the covariate (baseline depression). In order to obtain a clearer picture of the data, a moderated regression was run (see Table 7).

As can be seen in the table, the interaction between type of writing condition and nonjudgment was significant ($B = -.16$, $SEB = .06$, $p < .05$), supporting the overall hypothesis. Simple slopes analyses (Frazier et al., 2004), were conducted to fully understand the data. The slopes were analyzed at low, medium, and high (the mean and one standard deviation above and below the mean) levels of depression and nonreactivity.

Those with low levels of nonjudgment as measured by the FFMQ (those who were more judgmental of their inner experiences), averaged higher depression scores in the mindfulness condition than the self-affirmation condition at follow up for all levels of baseline depression (Low; $B = 2.61$, $SEB = .74$, $t(246) = 3.54$, $p < .05$, Medium; $B = 2.79$, $SEB = .53$, $t(246) = 5.28$, $p < .05$, High; $B = 2.96$, $SEB = .44$, $t(246) = 6.72$, $p < .05$.) This group also experienced an increase in depression from baseline in the mindfulness condition.

Those with high levels of nonjudgment as measured by the FFMQ, (those who were less judgmental of their inner experiences) also averaged higher depression

scores in the mindfulness condition than the self-affirmation condition at low levels of depression ($B = 3.51$, $SEB = .36$, $t(246) = 9.80$, $p < .05$), as well as an increase from baseline depression in the mindfulness group. At high levels of depression, those with high levels of nonjudgment experienced *lower* depression scores in the mindfulness condition than the self-affirmation condition ($B = -2.00$, $SEB = .71$, $t(246) = -2.81$, $p < .05$), though this represented a decrease in depression from baseline in both conditions. To obtain a visual understanding of the results, the predicted values at low and high levels of baseline nonjudgment and depression were also plotted (See Figure 9).

Table 7. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Depression Scores from Baseline Depression, Baseline Nonjudgment, and Type of Writing Condition

	Predictors	<i>B</i>	<i>SEB</i>	<i>df</i>	ΔF	R^2	ΔR^2	<i>P</i>	sr^2
Step 1				253	103.54	.55	.55	.00	
	Time 1 Depression*	.48	.04					.00	.23
	Time 1 Nonjudgment*	-.15	.03					.00	.05
	Condition**	1.78	.36					.00	.03
Step 2				250	16.06	.62	.07	.00	
	ConditionXNonjudgment	-.16	.06					.01	.01
	DepressionXNonjudgment	-.03	.01					.00	.01
	ConditionXDepression	-.36	.09					.00	.03
Step 3				249	8.66	.64	.01	.00	
	ConditionXDepressionXNonjudgment	-.06	.02					.00	.01

Note. sr^2 = the squared semipartial correlations indicate the unique variance predicted by the independent variable

*Variable Centered before Analysis

**Condition Contrast Coded Using Values .5, -.5, 0 for Mindfulness vs. Self-Affirmation

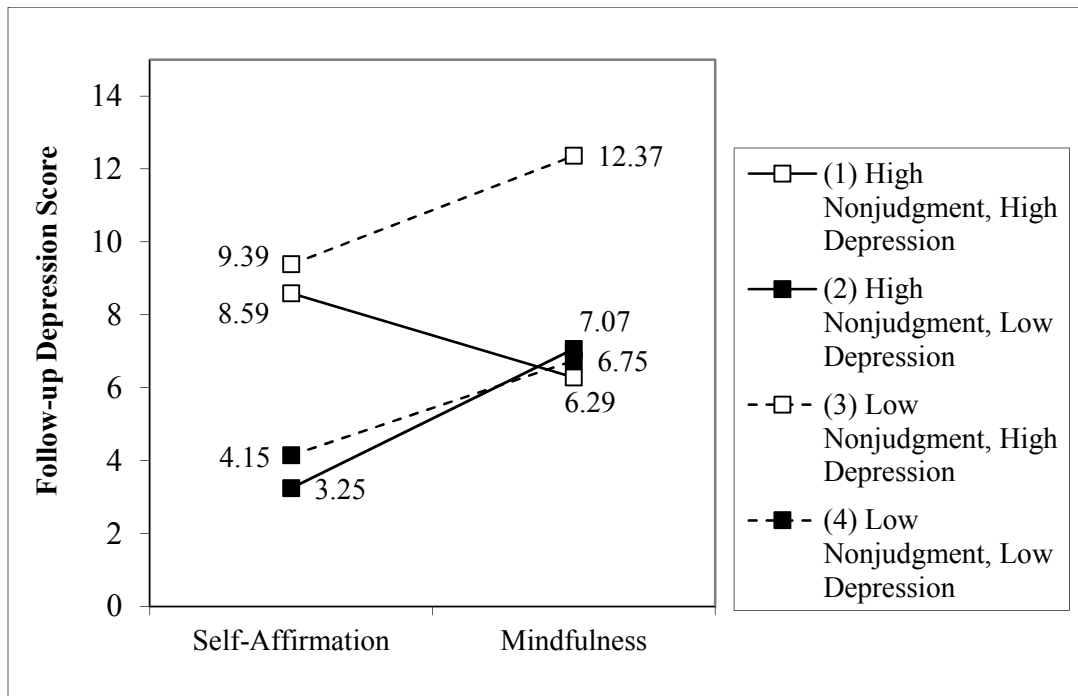


Figure 9. Interaction effect between baseline depression as measured by the EPDS, baseline nonjudgment, and type of writing condition on follow-up postpartum depression scores. Low depression = 4.11, High Depression = 10.69.

Hypothesis 3e. The relationship between writing condition and follow-up anxiety will be moderated by baseline levels of nonjudgment of inner experiences such that, controlling for baseline levels of anxiety, for those in the mindfulness condition the more judgmental of their inner experiences they are (i.e. the lower their scores are on the nonjudgment of inner experience subscale of the FFMQ) the higher their outcome anxiety scores will be, whereas for those in the self-affirmation condition outcome anxiety scores will not differ as a function of baseline

nonjudgment. An ANCOVA was run for the outcome measure of anxiety with the centered pre-test score as the covariate and baseline nonjudgment and contrast code for condition as the predictors. The interaction terms containing the covariate were examined to see if the data met the criteria for the assumption of homogeneity of slopes. None of the relevant interaction terms were statistically significant, indicating the data did meet the assumption for homogeneity of slopes. The interaction terms containing the covariate were then removed and the ANCOVA was run again (See Table 8). As can be seen in Table 8, there was a significant effect of both nonjudgment, $F(12, 236) = 623.87, p < .05$, and type of writing condition, $F(2, 236) = 628.63, p < .05$ on follow-up anxiety, controlling for initial level of anxiety. There was also a significant interaction of condition by nonjudgment, $F(5, 236) = 139.93$, on follow up anxiety, controlling for initial level anxiety. Follow-up pairwise comparisons revealed that those in the mindfulness condition averaged higher follow-up anxiety scores when their initial levels of nonjudgment were one standard deviation above the mean for the sample (when they were less prone to judging their inner experiences) ($M=54.30, SD=1.60$) compared to those whose initial levels of nonjudgment were one standard deviation below the mean (and thus less prone to judging their inner experiences) ($M=35.19, SD=3.14$) ($p<.05$).

Conversely, those in the self-affirmation condition averaged higher levels of outcome anxiety ($M=50.55, SD=1.85$) when initial levels of nonjudgment were low (e.g. when they were more prone to judging their inner experiences) compared to participants in the self-affirmation condition who were less prone judging their inner experiences ($M=44.21, SD=1.56$), $p<.05$.

Table 8. Summary of ANCOVA Predicting Outcome Anxiety Scores from Baseline Nonjudgment, and Type of Writing Condition, Controlling for the Effect of Baseline Anxiety.

Predictors	SS	Df	MS	F	P	$\eta^2_{partial}$
Time 1 Anxiety*	245.03	1	245.03	22.65	.00	.09
Time 1 Nonjudgment*	7486.41	12	623.87	57.68	.00	.75
Condition**	1257.27	2	628.63	58.12	.00	.33
ConditionXNonjudgment	7567.44	5	1513.49	139.93	.00	.75
Error	2552.56	236	10.82			

Note. $\eta^2_{partial}$ = the unique variance predicted by the independent variable

*Variable Centered before Analysis

**Condition Contrast Coded Using Values .5, -.5, 0 for Mindfulness vs. Self-Affirmation

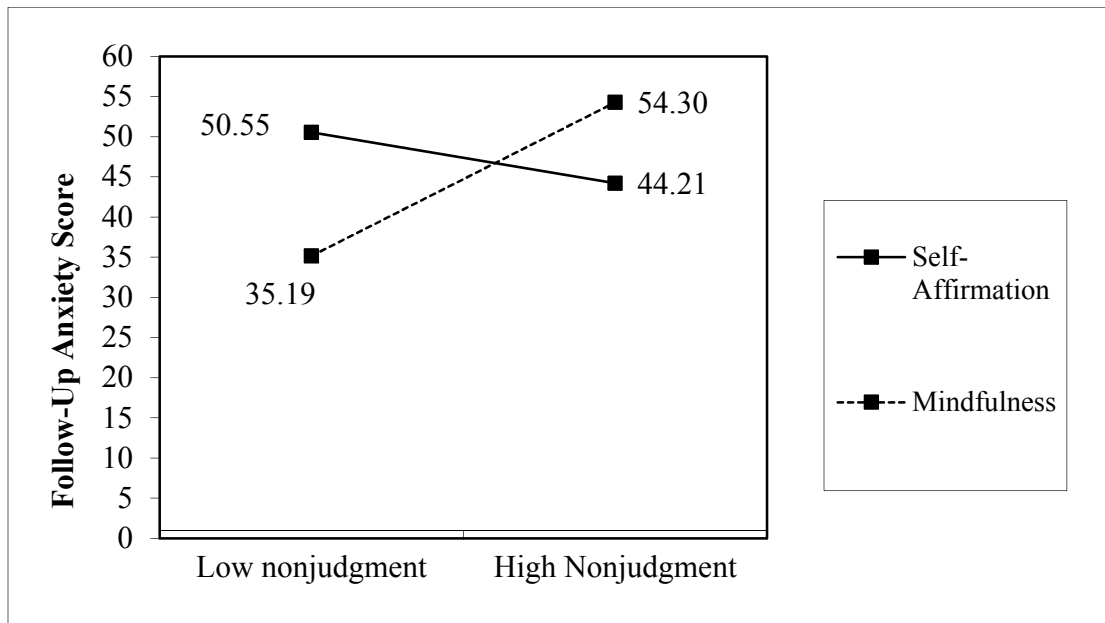


Figure 10. Estimated marginal means at low and high levels of baseline nonjudgment at mean (47.56) anxiety levels.

Hypothesis 3f. The relationship between writing condition and follow-up well-being will be moderated by baseline levels of nonjudgment of inner experiences such that, controlling for baseline levels of wellbeing, for those in the mindfulness condition the more judgmental of their inner experiences they are (i.e. the lower their scores are on the nonjudgment of inner experience subscale of the FFMQ) the more complaints related to wellbeing they will report at outcome, whereas for those in the self-affirmation condition outcome complaints related to wellbeing will not differ as a function of baseline nonjudgment. An ANCOVA was run for the outcome measure of wellbeing with the centered pre-test score as the covariate and condition and time 1 nonjudgment as the predictors. The condition variable was contrast coded using the

values .5, -.5, and -0, according to Cohen, Cohen, Aiken, and West (2003) to compare the two treatment groups. The interaction terms containing the covariate were examined to see if the data met the criteria for the assumption of homogeneity of slopes. Two of the three relevant interaction terms were statistically significant at the $p < .05$ level. The significance of these terms indicated that this data did not meet the criteria for the assumption of homogeneity of slopes, in other words the influence of nonjudgment and condition on outcome postnatal wellbeing complaints varies depending on the covariate (baseline postnatal wellbeing complaints). In order to obtain a clearer picture of the data, a moderated regression was run (see Table 9).

As can be seen in the table, the interaction between type of writing condition and nonjudgment was significant ($B=1.21$, $SEB = .70$, $p < .05$). However, this interaction was in the opposite of the expected direction, and accounted for a very small portion of unique variance ($sr^2 = .002$). Thus, the hypothesis was not supported. Simple slopes analyses (Frazier et al., 2004), were conducted to fully understand the data. The slopes were analyzed at low, medium, and high (for the sample) levels of postnatal wellbeing and nonjudgment.

Results indicated that those the mindfulness condition averaged more complaints related to postpartum wellbeing at follow-up than those in the self-affirmation condition across all levels of baseline nonjudgment and wellbeing (See Table 10.)Those in the mindfulness condition also experienced an average increase in complaints related to postpartum wellbeing from baseline to follow-up in the mindfulness condition and an average decrease in complaints in the self-affirmation condition, across all combinations of baseline nonjudgment and wellbeing. To obtain

a visual understanding of the results, the predicted values at low and high levels of baseline nonjudgment and wellbeing complaints were also plotted (See Figure 11).

Table 9. Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Postpartum Wellbeing Scores from Baseline Wellbeing Scores, Baseline Nonjudgment, and Type of Writing Condition

Predictors		<i>B</i>	<i>SEB</i>	<i>df</i>	ΔF	R^2	ΔR^2	<i>P</i>	sr^2
Step 1				253	289.74	.78	.78	.00	
	Time 1 Postpartum Wellbeing Complaints*	.84	.03					.00	.64
	Time 1 Nonjudgment* Condition**	-.62	.27					.00	.00
		80.28	29.27					.01	.01
Step 2				250	9.34	.80	.02	.00	
	ConditionXNonjudgment	1.21	.70					.01	.01
	WellbeingXNonjudgment	-.02	.01					.09	
	ConditionXWellbeing	-.60	.22					.02	.01
Step 3				249	.16	.80	.00	.01	
	ConditionXWellbeingXNonjudgment	-.01	.01					.69	

Note. sr^2 = the squared semipartial correlations indicate the unique variance predicted by the independent variable

*Variable Centered before Analysis

**Condition Contrast Coded Using Values .5, -.5, 0 for Mindfulness vs. Self-Affirmation

Table 10. *Summary of Slopes Analyses for Outcome MPH-I Score, Based on Low, Medium, and High Scores of Baseline Postnatal Wellbeing Complaints and Nonjudgment.*

<i>Low Nonjudgment</i>	Simple Slope (<i>B</i>)	<i>SE</i>	<i>t</i>	<i>df</i>	<i>p</i>
Low MPH	98.93	37.88	2.61	246	.01
Mean MPH	72.58	27.79	2.61	246	.01
High MPH	46.23	17.64	2.62	246	.01
<i>Mean Nonjudgment</i>					
Low MPH	108.10	39.26	2.75	246	.04
Mean MPH	80.28	29.27	2.74	249	.01
High MPH	52.46	19.32	2.72	249	.01
<i>High Nonjudgment</i>					
Low MPH	117.28	41.16	2.85	246	.00
Mean MPH	87.99	31.31	2.81	249	.01
High MPH	58.70	21.62	2.72	249	.01

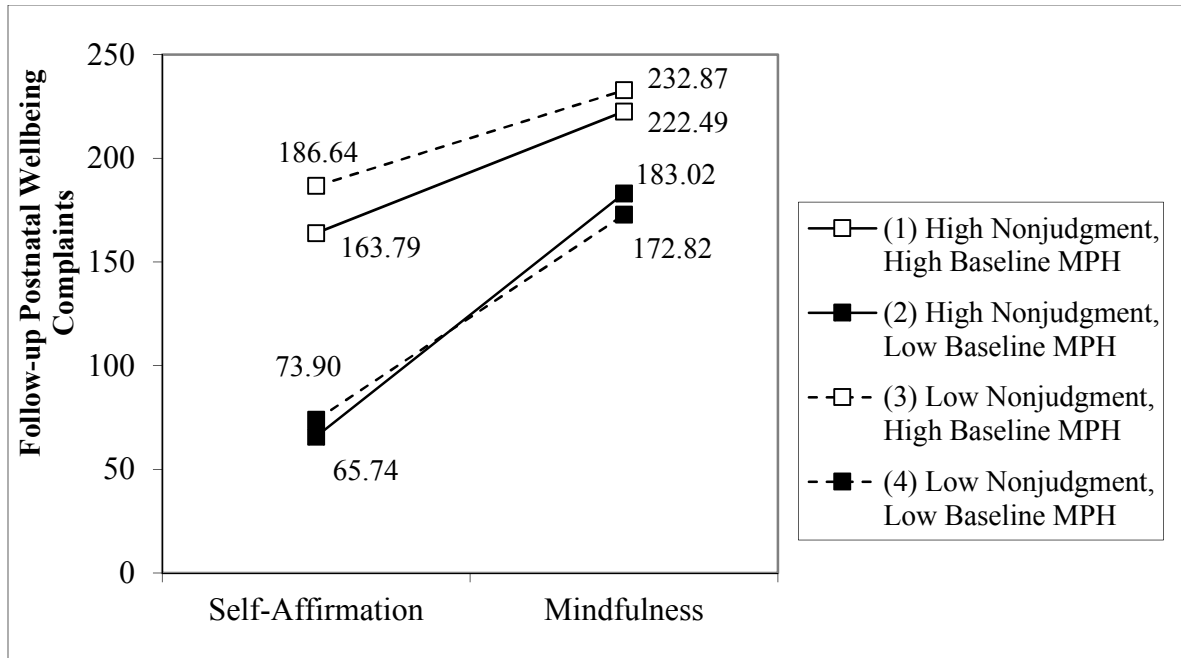


Figure 11. Interaction effect between baseline wellbeing as measured by the MPH-I, baseline nonjudgment, and type of writing condition on follow-up postpartum wellbeing scores. Low and high values of baseline MPH-I used were one standard deviation below and above the mean (98.18, 190.75). Lower scores on the MPH-I indicate better postpartum wellbeing.

Research Question 1: Will participants in the mindfulness condition report an increase in mindfulness at follow up? Previous studies of traditional expressive writing have not found increases in mindfulness (Moore et al., 2009; Poon & Danoff-Burg, 2011). However, the authors of that study note that they did not expect any change since there were no mindfulness-based instructions.

Since the research question is specifically related to whether or not mindfulness scores increased from baseline to follow-up, gain scores were used for

this analysis. Mindfulness gain scores (posttest - pretest) were analyzed in an analysis of variance with treatment group (mindfulness writing, self-affirmation writing, and waitlist) as the independent variable. There was a mean gain in mindfulness in both writing conditions, though the mean gain in mindfulness for those in the mindfulness writing condition ($M = .64, SE = 1.43$) was smaller than the mean gain for those in the self-affirmation condition ($M = 8.26, SE = 1.45$). The effect size of the difference between gain scores in the two writing conditions was large, $d = -3.17$, 95% CI [-3.55, -2.79]. In the waitlist condition, the mean change in scores was negative ($M = -7.46, SE = 1.49$), meaning mindfulness scores decreased somewhat. The effect size of the difference in gain scores between those in the mindfulness writing condition and those in the waitlist condition was large, $d = 4.01$, 95% CI [3.47, 4.56.], though not as large as the difference between self-affirmation and waitlist conditions, $d = 9.35$, 95% CI [8.29, 10.41]. To explore how level of baseline mindfulness might have influenced the differences between self-affirmation and mindfulness, a moderated regression was run with baseline mindfulness levels and a contrast code comparing the two types of writing condition as the predictors, and gain scores as the outcome variable (See Table 11).

As can be seen in the table, the effects of type of writing, baseline mindfulness, and the interaction between the two all had significant but very small effects on the changes in mindfulness from baseline to follow-up. The mean baseline mindfulness score of 131.09 was slightly higher than a study with a similar sample of postpartum women, though that sample required that the women be suffering from depressive symptoms (Buttner, 2013). Simple slopes analyses (Frazier et al., 2004),

were conducted to fully understand the data. The slopes were analyzed at one standard deviation below and above mean baseline levels of mindfulness. Results indicated that although there was an inverse relationship between baseline mindfulness as measured by the FFMQ and mindfulness gain score for both conditions, the slopes did not meet the criteria for significance for either the mindfulness condition ($B = -.152$, $SEB = 2.00$, $t(253) = -.07$, $p > .05$,) or self-affirmation ($B = -.412$, $SEB = 2.01$, $t(253) = -.20$, $p > .05$.) To obtain a visual understanding of the results, the predicted values at low and high levels of baseline trait mindfulness score on the FFMQ were plotted (See Figure 12).

Table 11. *Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Gain Scores from Baseline Mindfulness and Type of Writing Condition.*

Predictors	<i>B</i>	<i>SEB</i>	<i>Df</i>	ΔF	R^2	ΔR^2	<i>P</i>	sr^2
Step 1			254	32.24	.20	.20	.00	
Condition	-7.17	2.00					.00	.04
Baseline Mindfulness *	-.28	.06					.00	.07
Step 2			253	4.40	.22	.02	.00	
ConditionXBaseline Mindfulness	.26	.12					.04	.01

Note. sr^2 = the squared semipartial correlations indicate the unique variance predicted by the independent variable

*Variable Centered before Analysis **Condition Contrast Coded Using Values .5, -.5, 0 for Mindfulness vs. Self-Affirmation

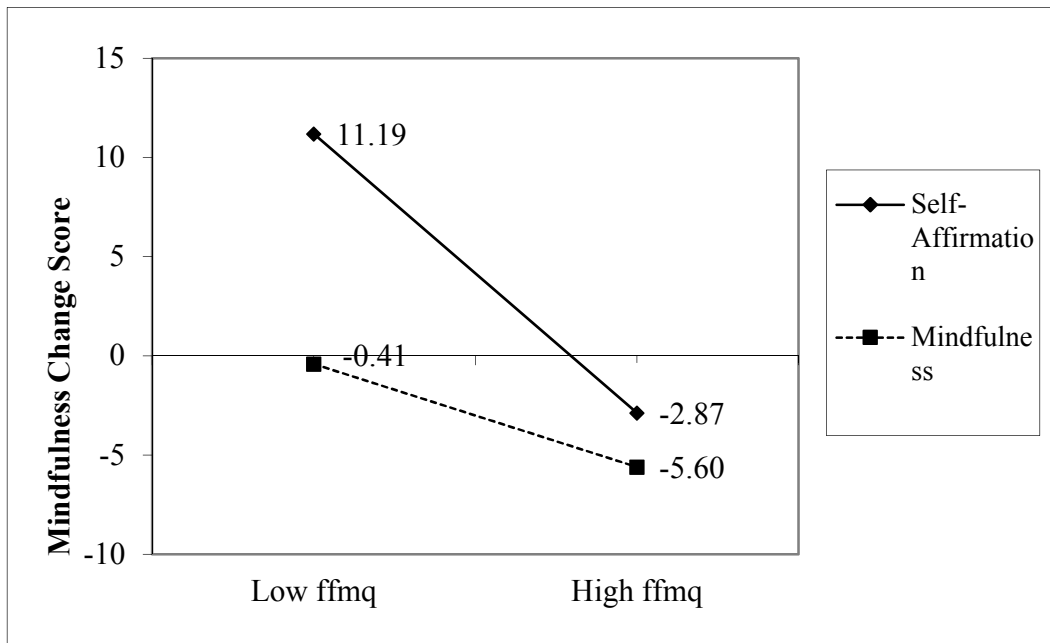


Figure 12. Interaction effect between baseline mindfulness as measured by the FFMQ and type of writing condition on mindfulness change scores between baseline and follow-up. Low and high values of baseline FFMQ used were one standard deviation below and above the mean (113.74, 147.87.)

Research Question 2: Will participants' reported levels of positive and negative affect change over the course of the writing sessions for the mindfulness and self-affirmation conditions? There is little research on the influence of positive writing interventions on positive and negative affect. Whereas some authors have found reductions in negative affect after expressive writing interventions (Leary, Tate, Adams, Allen, & Hancock, 2007), some have found no significant influence on mood at all (Zabelina & Robinson, 2010). As stated earlier, some postpartum women are vulnerable to mood disorders, and it is important to examine the impact interventions

have on positive and negative affect. Paired samples t-tests were used to examine the differences in positive and negative affect across the individual sessions (See Table 12).

Table 12. Means, Standard Deviations and Paired *t*-tests for Measures of Affect Before and After Individual Writing Sessions.

		Mean(SD) PANAS Before	Mean(SD) PANAS After	Paired <i>t</i> -test	Sig. (2-tailed)	<i>d</i>
Mindfulness	Negative Affect					
	Session 1	6.62(2.51)	6.57(1.75)	0.26	0.79	0.03
	Session 2	6.94(2.59)	7.90(4.03)	-4.93	.00*	-0.52
	Session 3	7.03(2.92)	6.70(2.54)	2.42	.02*	0.26
	Positive Affect					
	Session 1	13.31(3.76)	14.58(4.11)	-4.90	.00*	-0.52
	Session 2	13.64(4.13)	14.25(4.03)	-2.90	.01*	-0.31
	Session 3	13.17(3.98)	13.69(4.81)	-2.42	.02*	-0.26
Self-Affirmation	Negative Affect					
	Session 1	7.79(3.27)	8.00(3.15)	-0.58	0.56	-0.06
	Session 2	6.60(2.02)	6.72(3.02)	-0.72	0.48	-0.08
	Session 3	6.91(3.03)	7.00(2.16)	-0.36	0.72	-0.04
	Positive Affect					
	Session 1	13.16(3.32)	14.5(4.34)	-4.78	.00*	-0.52
	Session 2	12.58(3.95)	12.70(3.75)	-0.50	0.62	-0.05
	Session 3	13.03(3.16)	12.99(3.65)	0.12	0.90	0.01

Note. *d*=the Cohen's effect size *d*, calculated by dividing the mean difference by the standard deviation of the mean difference .
 *=significant at $p < .05$.

Negative Affect. As can be seen in Table 12, in the self-affirmation condition, there were no significant differences in negative affect before and after any of the writing sessions. In the mindfulness condition, there was no change before and after the first session, a medium increase in negative affect over the course of the second session, and a small decrease in negative affect over the course of the third session.

For the outcome variable of the change in negative affect across the six session for the two writing conditions based on the six timepoints (the PANAS completed before and after each writing session), a two-way 2 (condition: mindfulness or self-affirmation) X 6 (timepoints 1 through 6) mixed ANOVA was run. The six time points served as the repeated measures variable, and the two types of writing condition served as the between groups variable. Mauchly's sphericity test for the repeated measures variable was examined for significance. The main effect of timepoint was found to violate this test, $W = .174, \chi^2 = 298.83, p < .05$, so the Greenhouse-Geisser corrected degrees of freedom were used to assess the significance of the F values related to the repeated measures portion of the analyses (the six timepoints.)

There was a significant main effect of timepoint, $F(3.38, 584.93) = 2.68, p < .05$, meaning that ignoring the effect of condition, there were significant differences across some timepoints. Pairwise comparisons showed that the differences between time 1 and time 3, 2 and 3, 3 and 4, 2 and 6, and 4 and 6 were significant ($p < .05$), whereas the remaining pairs were not.

Levene's tests were then examined and it was confirmed that the results were nonsignificant, indicating the data met the assumption for homogeneity of variance.

The F test for the main effect of condition did not meet the criteria for significance, $F(1,173) = .386, p > .05$, meaning that ignoring the effect of timepoint there was not a significant difference between the two writing conditions.

There was a significant timepoint X condition interaction, $F(3.38, 584.93) = 2.68, p < .05$. Using the estimated marginal means, a chart was created to gain a visual understanding of the data (See Figure 13.)

Positive Affect. In the self-affirmation condition, there was a medium increase in mean positive affect after the first writing session, but there were no significant differences in positive affect as measured by the PANAS before and after the other two sessions. In the mindfulness condition, there was a significant and medium increase in mean positive affect over the first writing session, and a small increase in mean positive affect over the second and third sessions.

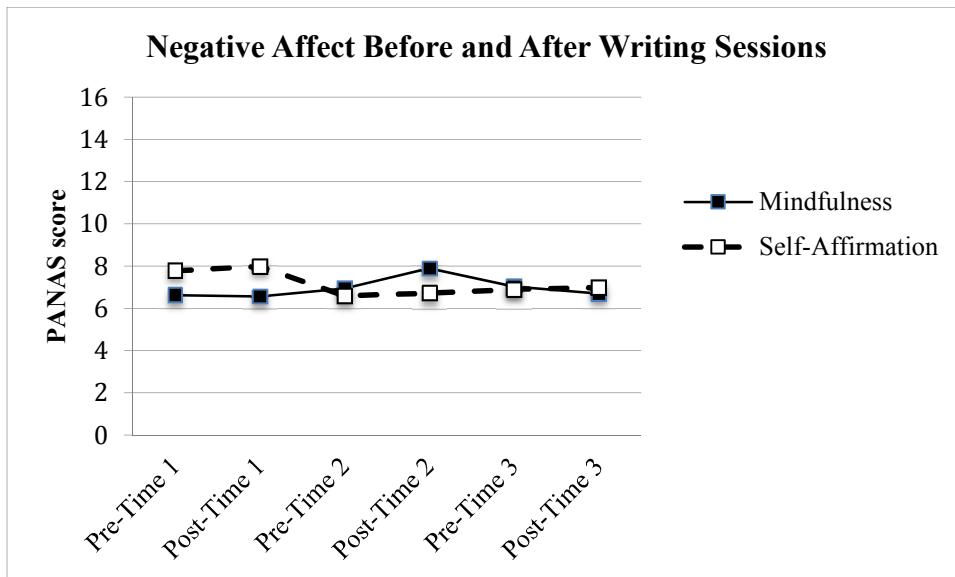


Figure 13. Interaction effect between timepoint and condition on level of negative affect.

For the outcome variable of the change in positive affect across the six sessions for the two writing conditions based on the PANAS completed before and after each writing session, another two-way 2 (condition: mindfulness or self-affirmation) X 6 (timepoints 1 through 6) mixed ANOVA was run. The six time points served as the repeated measures variable, and the two types of writing condition served as the between groups variable. Mauchly's sphericity test for the repeated measures variable was examined for significance. The main effect of timepoint was found to violate this test, $W = .542, \chi^2 = 104.80, p < .05$, so the Greenhouse-Geisser corrected degrees of freedom were used to assess the significance of the F values related to the repeated measures portion of the analyses (the six timepoints.)

There was a significant main effect of timepoint, $F(4.16, 719, 69) = 13.07, p < .05$, meaning that ignoring the effect of condition, there were significant differences across some timepoints. Pairwise comparisons showed that the differences between time 2 and all other timepoints were significantly higher than other timepoint, time 3 and time 4 were significantly different ($p < .05$), whereas the remaining pairs were not.

Levene's tests were then examined and it was confirmed that the results were nonsignificant, indicating the data met the assumption for homogeneity of variance. The F test for the main effect of condition did not meet the criteria for significance, $F(1, 173) = 1.34, p > .05$, meaning that ignoring the effect of timepoint there was not a significant difference between the two writing conditions.

There was a significant timepoint X condition interaction, $F(4.16, 719.69) = 13.067$, $p < .05$. Using the estimated marginal means, a chart was created to gain a visual understanding of the data (See Figure 14.)

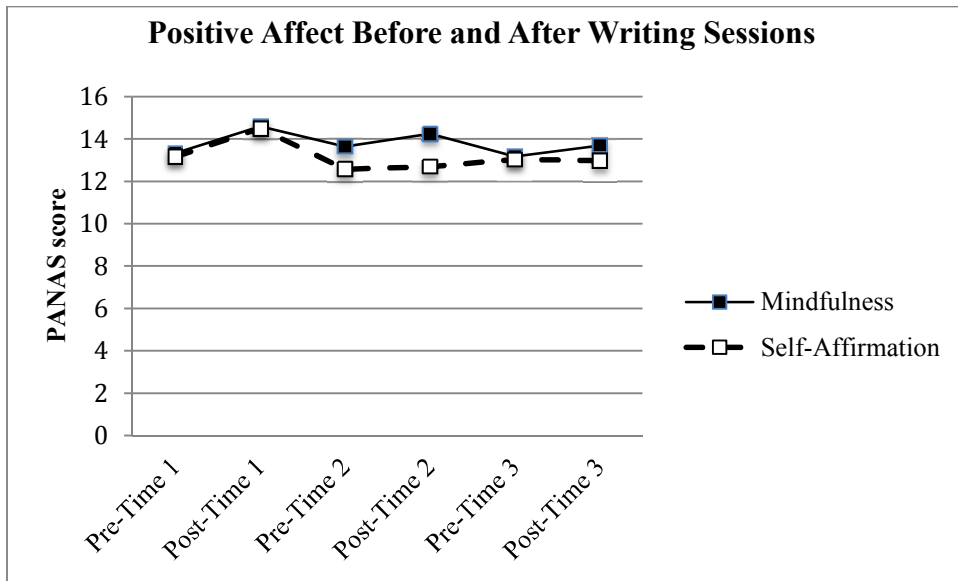


Figure 14. Interaction effect between timepoint and condition on level of positive affect.

Additional Analyses

Differences between Writing Conditions on Outcomes. The primary main effects hypotheses focused on differences between the writing and waitlist conditions. To elucidate further differences between the writing conditions that may have been obscured by combining the two writing conditions, three ANCOVAs were run to further understand differences in outcomes between self-affirmation and mindfulness, one each for depression, anxiety and postpartum wellbeing complaints.

Depression. An ANCOVA was run for the outcome measure of depression with the centered pre-test score as the covariate and condition as the predictor. In order to ascertain whether the data met the assumption of equality of slopes, a second step containing an interaction term of the contrast code for mindfulness vs. waitlist by time 1 depression score was entered. This term was significant ($d < .05$), and thus a regression was run with baseline depression entered as a moderator. The contrast code was multiplied by the centered baseline depression score representing the interaction between the predictor (condition) and the moderator (baseline depression). The squared semipartial correlations between the variables of interest were examined for each of the variables to ascertain the effect size. As depicted in Table 13 the relationship between baseline and outcome depression levels was stronger in the Self-Affirmation condition such that at one standard deviation below the mean baseline depression levels those in the self-affirmation condition scored lower at outcome than those in the mindfulness condition, but scores did not differ between conditions for those who started out at high levels of baseline depression. The tests of significance of simple slopes met the criteria for both the mindfulness condition ($B = .37$, $SEB = .07$, $p < .05$) and the self-affirmation condition ($B = .75$, $SEB = .06$, $p < .05$). To see if the proportion of participants who scored above the screening cutoff of ≥ 9 on the EPDS changed between time 1 and time 2, three McNemar's tests were run for the two time points for the two writing conditions and the waitlist condition. In the self-affirmation condition, there were more participants who met the screening cutoff for depression at time 1, (34.88%) than time 2 (25.58%), and this difference was significant at $p < .05$. In the mindfulness condition, more of the participants met the

cutoff at time 2 (55%) than at time 1 (32.58%) and this difference was also significant ($p < .05$). For those on the waitlist, 35.37% of the participants met the cutoff at time 1, and 40.25% met the cutoff at time 2, significant at $p < .05$.

Table 13. *Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Depression Scores from Baseline Depression and Type of Condition*

Predictors	<i>B</i>	<i>SEB</i>	<i>Df</i>	ΔF	R^2	ΔR^2	<i>P</i>	sr^2
Step 1			253	113.3	.47	.47	.00	
Condition**	1.36	.31					.00	.04
Time 1 Depression*	.56	.04					.00	.37
Step 2			250	17.18	.51	.03	.00	
ConditionXDepression	-.385	.09					.00	.03

Note. sr^2 = the squared semipartial correlations indicate the unique variance predicted by the independent variable

*Variable Centered before Analysis

**Condition Contrast Coded Using Values .5, -.5, 0 for Mindfulness vs. Self-Affirmation

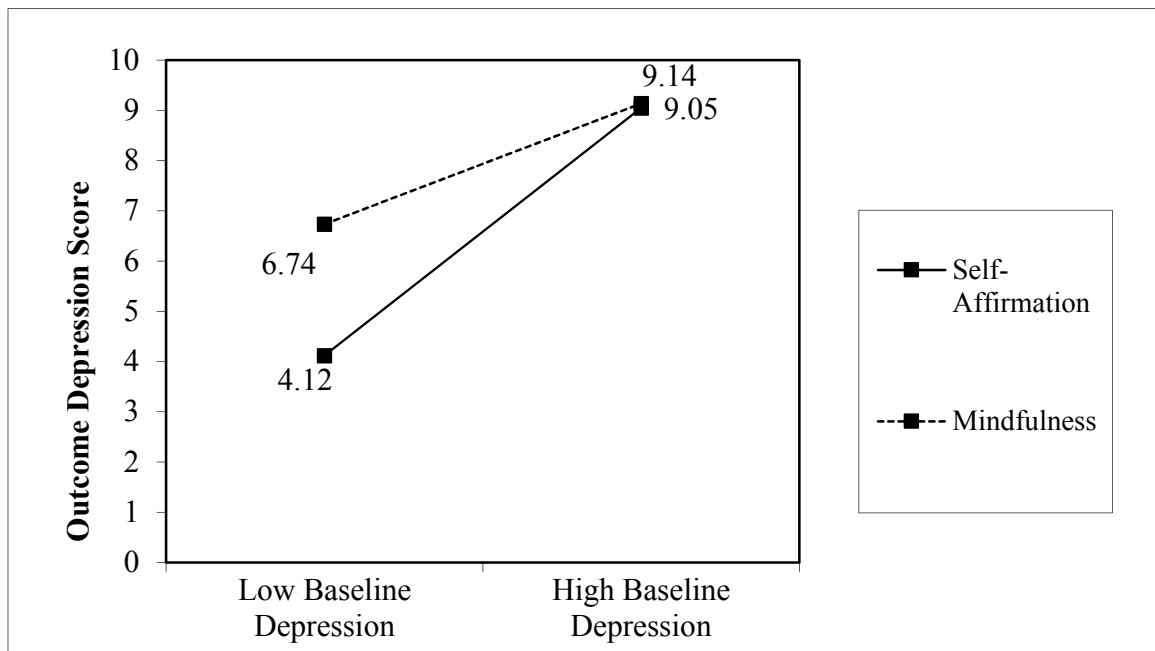


Figure 15. Interaction effect between baseline depression and writing condition on follow-up depression. Low and high values of depression used were one standard deviation below and above the mean (4.11, 10.69).

Anxiety. An ANCOVA was run for the outcome measure of anxiety with the centered pre-test score as the covariate and condition as the predictor. In order to ascertain whether the data met the assumption of equality of slopes, a third step containing an interaction term of the contrast code for mindfulness vs. Self-affirmation X baseline anxiety was entered. This term was not significant, $F(1,253) = -1.65, p > .05$. Since the term was not significant, the ANCOVA was run again without the interaction term. As can be seen in table 14, although the coefficients were both statistically significant, the effect of baseline anxiety far outweighed the effects of condition. Calculating the estimated marginal means for self-affirmation ($M=49.55, SE=.96$) and mindfulness ($M=49.49, SE=.94$) revealed no significant difference between the two conditions. Again, McNemar's tests were also run to examine the differences in the proportion of participants who scored above the screening cutoff (45) on the PSWQ at both timepoints. There were no statistically significant differences between time 1 and time 2 for any of the conditions ($p > .05$.)

Table 14. Summary of ANCOVA Predicting Outcome Anxiety Scores from Writing Condition, Controlling for the Effect of Baseline Anxiety.

Predictors	SS	Df	MS	F	P	$\eta^2_{partial}$
Time 1 Anxiety*	20650	1	20,650.86	261.69	.00	.26
Condition**	1299.36	2	649.68	8.23	.00	.003
Error	2552.56	253	10.82			

Note. $\eta^2_{partial}$ = the unique variance predicted by the independent variable

*Variable Centered before Analysis

**Condition Contrast Coded Using Values .5, -.5, 0 for Mindfulness vs. Self-Affirmation

Wellbeing. An ANCOVA was run for the outcome measure of wellbeing with the centered pre-test score as the covariate and condition as the predictor. In order to ascertain whether the data met the assumption of equality of slopes, a second step containing an interaction term of the contrast code for mindfulness vs. waitlist by time 1 depression score was entered. This term was significant ($d < .05$), and thus a regression was run with baseline complaints related to wellbeing entered as a moderator. The contrast code was multiplied by the centered baseline complaints to wellbeing score representing the interaction between the predictor (condition) and the moderator (baseline complaints to wellbeing). The squared semipartial correlations between the variables of interest were examined for each of the variables to ascertain the effect size. As depicted in Table 15 and Figure 16, both condition and complaints interacted to predict outcome postpartum health complaints. As depicted in Table 13 there was a strong relationship between baseline and outcome postpartum health complaints, and this association was larger in the Self-Affirmation condition. The tests of significance of simple slopes met the criteria for both the mindfulness condition ($B = .67, SEB = .04, p < .05$) and the self-affirmation condition ($B = .97, SEB = .04, p < .05$).

Table 15. *Summary of Hierarchical Moderated Multiple Regression Analysis Predicting Outcome Postpartum Health Complaints from Baseline Complaints and Condition*

Predictors	<i>B</i>	<i>SEB</i>	<i>Df</i>	ΔF	R^2	ΔR^2	<i>P</i>	sr^2
Step 1			253	424.44	.77	.77	.00	
Condition**	-4.24	3.16					.18	
Time 1 Wellbeing Complaints*	.82	.03					.00	.67
Step 2			250	23.09	.79	.02	.00	
Condition X Wellbeing Complaints	-.30	.06					.00	.02

Note. sr^2 = the squared semipartial correlations indicate the unique variance predicted by the independent variable

*Variable Centered before Analysis

**Condition Contrast Coded Using Values .5, -.5, 0 for Mindfulness vs. Self-Affirmation

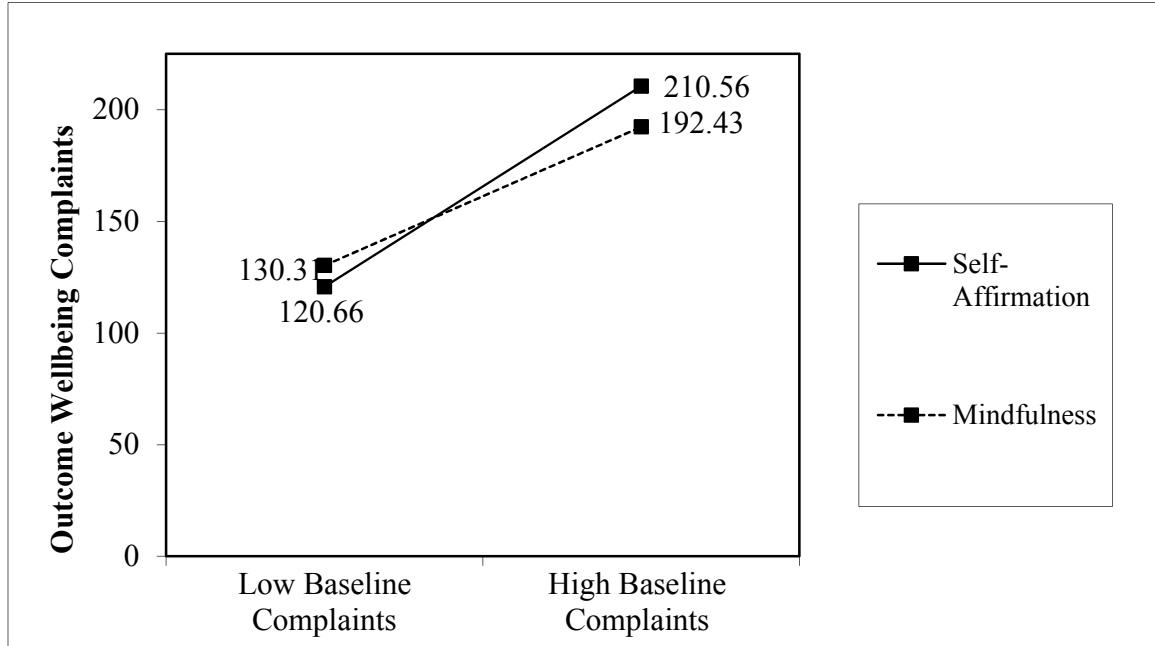


Figure 16. Interaction effect between baseline wellbeing and writing condition on follow-up wellbeing. Low and high values of baseline complaints related to postpartum wellbeing used were one standard deviation below and above the mean (98.18, 190.75). Lower scores on postpartum health complaints scale indicate higher postpartum wellbeing.

Affect as a Mediating Variable

The hypothesized moderation variables had extremely small effects, often not supporting the hypotheses. Considering that the mindfulness condition tended to increase affect based on the differences between before and after the writing session, the self-affirmation condition did not, post-hoc mediation analyses were conducted to test the significance of average post-session positive and negative affect (measured immediately after writing sessions) as possible mediators of the relationship between pre and post measures.

To test all of the following mediation effects, the significance of the indirect effects were tested using bootstrapping procedures with the Hayes Process Macro Model 4 for SPSS. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles.

Post-Writing Negative Affect and Anxiety. The relationship between baseline and follow-up anxiety was mediated by average post-writing negative affect (measured immediately after writing sessions) as measured by the PANAS. The standardized regression coefficients between baseline anxiety scores and mean post-writing negative affect, as well as between mean post-writing negative affect and outcome anxiety were significant at $p < .05$ (see Figure 17). The bootstrapped unstandardized indirect effect was .15, and the 95% confidence interval ranged from .11 to .19. Thus, the indirect effect was statistically significant. The mediator could account for approximately 12% of the total effect, $P_M = .12$

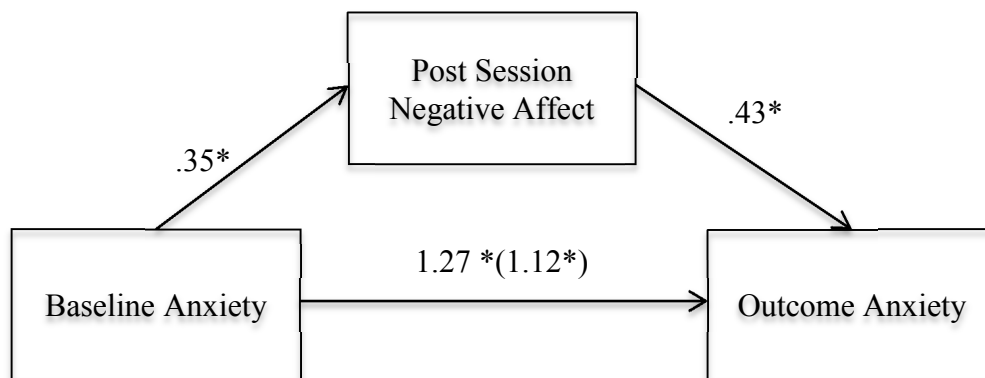


Figure 17. Standardized regression coefficients for the relationship between baseline and outcome anxiety as mediated by post-session negative affect. The standardized regression coefficient between baseline and outcome anxiety controlling for post-session negative affect is in parenthesis.

* $p < .05$

Post-Writing Negative Affect and Depression. The relationship between baseline and follow-up depression was mediated by average post-writing negative affect (measured immediately after writing sessions) as measured by the PANAS. The standardized regression coefficients between baseline depression scores and mean post-writing negative affect, as well as between mean post-writing negative affect and outcome depression were significant at $p < .05$ (see Figure 18). The bootstrapped unstandardized indirect effect was .11, and the 95% confidence interval ranged from

.07 to .17. Thus, the indirect effect was statistically significant. The mediator could account for approximately 22% of the total effect, $P_M=.22$.

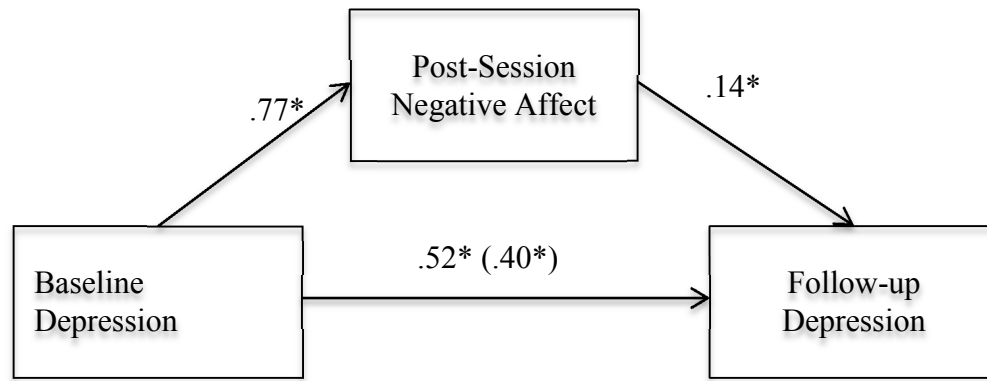


Figure 18. Standardized regression coefficients for the relationship between baseline and follow-up depression as mediated by post-session negative affect. The standardized regression coefficient between baseline and outcome anxiety controlling for post-session negative affect is in parenthesis.

* $p < .05$

Wellbeing and Post-Writing Negative Affect. Average post-writing negative affect (measured immediately after writing sessions) was not found to mediate the relationship between baseline and follow-up wellbeing scores. The bootstrapped indirect effect was $-.0005$, and the confidence interval ranged from $-.013$ to $.01$, thus the indirect effect was not statistically significant.

Post-Writing Positive Affect and Anxiety. Average post-writing positive affect (measured immediately after writing sessions) was not found to mediate the relationship between baseline and follow-up anxiety scores. The bootstrapped

indirect effect was .02, and the confidence interval ranged from -.003 to .04, thus the indirect effect was not statistically significant.

Depression and Post-Writing Positive Affect. Average post-writing positive affect (measured immediately after writing sessions) was not found to mediate the relationship between baseline and follow-up depression scores. The bootstrapped indirect effect was -.003, and the confidence interval ranged from -.02 to .01, thus the indirect effect was not statistically significant.

Wellbeing and Post-Writing Positive Affect. Average post-writing positive affect (measured immediately after writing sessions) was not found to mediate the relationship between baseline and follow-up complaints to wellbeing scores. The bootstrapped indirect effect was .02, and the confidence interval ranged from -.002 to .04, thus the indirect effect was not statistically significant.

Weeks postpartum and outcome measures. The associations between the baby's baseline age in weeks/mother's weeks postpartum with baseline maternal depression, anxiety, and wellbeing were examined for significance (see Table 16 for results). Complaints related to wellbeing were lower in women who were in the later postpartum stages, but this was not the case for depression or anxiety. Depression was relatively stable, though the women who were in the later postpartum stages had a slightly higher (less than one point) score on the depression scale than women in the earliest stages. Anxiety scores were also lowest in women in the earlier postpartum phases, and highest in women who were between 25 and 42 weeks postpartum. A one-way ANOVA was used to confirm that differences in the reported age of the baby did not differ between conditions ($p > .05$).

Table 16. Means and Standard Deviations for Anxiety, Depression, and Wellbeing at Varying Weeks after Childbirth

	<i>n</i>	PSWQ (Anxiety)	EPDS (Depression)	M-PHI (Postpartum Wellbeing)
9-16 Weeks	36	42.81(7.10)	7.38(2.59)	71.89(32.67)
17-24 Weeks	80	45.98(9.75)	6.12(2.62)	149.87(38.6)
25-32 Weeks	64	50.59(8.61)	7.11(2.85)	132.52(48.73)
33-42 Weeks	77	50.10(9.35)	8.13(3.17)	131.44(50.83)

Breastfeeding Status, Distress, and Wellbeing. Recent reviews of the literature have found associations between depression and breastfeeding during the postpartum period suggesting the possibility that breastfeeding may provide a protective effect (Dias & Figueiredo, 2015). To see if there were similar associations in this dataset, bivariate correlations between breastfeeding status and baseline measures of anxiety, depression, overall wellbeing, and the physical health subscale of the wellbeing measure. Supporting previous findings, small but significant negative associations were found between breastfeeding status and baseline physical health complaints ($r=-.13, p<.05$), and breastfeeding status and baseline depression ($r=-.23, p<.05$). No associations were found between overall time 1 breastfeeding status and overall wellbeing or anxiety.

Summary of Results

Differences between Treatment and Waitlist. Those in the writing conditions did not differ significantly from those in the waitlist conditions on overall outcomes of depression, anxiety, and wellbeing. There was a relationship found between baseline anxiety and condition (writing vs. waitlist) such that those with higher baseline anxiety scores had higher outcome anxiety scores in the writing conditions compared to the waitlist conditions, and those with lower baseline anxiety scores had higher outcome anxiety scores in the waitlist condition.

Differences between Mindfulness and Self-Affirmation. There were few reliable differences found in outcome measures between mindfulness and self-affirmation, though additional analyses revealed a tendency for those lower in depression to benefit more from the self-affirmation condition. Those low in baseline depression had lower outcome depression scores in the self-affirmation condition than the mindfulness condition, and there was a decrease in the proportion of participants who met the screening cutoff for depression in the self-affirmation condition and an increase in both the mindfulness condition and the waitlist condition.

Additionally, those in the mindfulness condition used more emotion words during their writing, and experienced more changes in negative and positive affect scales of the PANAS after completing the interventions, whereas in the self-affirmation condition there was little change.

When exploring the research questions it was found that those in the self-affirmation condition gained an average of 8.26 points on the mindfulness scale from

follow up to baseline, whereas there was little change in the mindfulness condition and a 7.46 point average loss in the waitlist condition.

Interaction Effects. The moderation hypotheses predicted baseline levels of nonjudgment and nonreactivity would moderate the relationship between condition and outcome measures such that those with higher levels of nonreactivity and nonjudgment (e.g., more reactive and more judgmental) would have more anxiety, depression, and postpartum health complaints in the mindfulness condition than the self-affirmation condition. Although some statistically significant interaction effects were found, these were often extremely small in terms of effect size, and did not support or contradict the hypotheses in consistent ways.

Mediation Analyses. Based on post-hoc analyses there is some evidence that negative affect could mediate the relationship between baseline and follow-up measures of depression and anxiety.

In the discussion section I will explore possible reasons for the inconsistent results related to proposed moderators, and the possibility that affect mediated the relationship between baseline and follow up measures of depression, affect, and wellbeing, as well as suggest possibilities for future researchers to clarify these findings.

Chapter 6: Discussion

Though important research has been done on the transition to motherhood, there are notable gaps in the literature. Despite the recognized barriers to seeking professional help faced by women during the transition to parenthood, including stigma and instrumental barriers (J. a Maloni et al., 2013), little research focuses on inexpensive, flexible interventions easily accessible for women during this period (Engle, 2009). Expressive writing has been looked at with a wide variety of populations, including pregnant women (Bucci, Donati, & Solano, 2004) but has yet to be tested with women in the postpartum period until now.

Previous research on interventions for postpartum women has predominantly focused on postpartum depression, and failed to account for the varying levels of wellbeing and disparate experiences of new mothers (Hoffenaar et al., 2010). To explore how individual differences may influence how first-time mothers respond to expressive writing interventions, and to answer the call to examine moderators in the fields of mindfulness (Sass et al., 2013), expressive writing (J. W. Pennebaker, 2004), and positive psychology (Sin & Lyubomirsky, 2009) the hypotheses of the current study tested two facets of mindfulness, nonreactivity to inner experience, and nonjudgment of inner experience, as potential moderators of the writing conditions. In addition, the current study explored post expressive writing affect as a possible mediator of the relationship between baseline and outcome measures.

Although attrition was relatively high from the point when participants began the survey to the final follow up measures (30.5% and 35.8% for the mindfulness and self-affirmation conditions, respectively, and 52.6% for the waitlist condition), for

clinical considerations it's also important to consider that the attrition rates for the end of completion of the exercises, rather than the completion of the follow-up measures. For those in the mindfulness condition, this attrition rate was from the completion of the initial survey to the completion of the third writing exercise was 22.6%, for those in the self-affirmation condition it was 21.6%.

Despite attempts to recruit a diverse sample, in some ways this sample was fairly homogenous and these aspects should be taken into account when interpreting the results. The sample was, on the whole, older, wealthier, more educated, and more likely to be married than the US averages (Martin, Joyce A, Hamilton, Brady E., Osterman, Michelle J.K., Curtin, Sally C., Mathews, 2015). This may be due to the fact that the majority of listservs and websites that agreed to post the survey were located in states in which the mean birth age was higher. For example, in Washington DC, Virginia, New York, and California, the majority of births are to mothers between the ages of 30 and 39 (Demographic Characteristics of Mother by State/County, 2013 National Vital Statistics System). The mean age for this sample (33.7) was markedly higher than the nationwide mean for the first time women give birth, which is 26 ("Births and Natality (Centers for Disease Control and Prevention, 2013)," but in line with the mean ages of births for women in many urban areas such as Washington, D.C. and NYC . Additionally, the majority of participants responded to posts on parent listservs, and there may be specific differences between mothers who do and do not join parenting listservs. Though attempts were made to post on listservs specifically targeting young mothers and unmarried mothers, the moderators of these listservs often did not agree to post the study. Though as described in the

previous chapter the descriptions of participants' ethnicity is likely incomplete due to technical problems preventing participants from selecting more than one ethnicity, the sample's ethnic distribution was somewhat heterogenous. The percentages of participants who were European-American, African-American, and Asian/Pacific Islander in the current study were similar to national averages (Demographic Characteristics of Mother by State/County, 2013 National Vital Statistics System).

This sample was more anxious than depressed, as the mean depression level was below the lowest recommended screening cutoff, and the range was fairly limited. In terms of anxiety, however, the sample showed a higher mean above the recommended screening cutoff, with a broader range of values. Though the mean level of anxiety was slightly higher than normative values for the general population (46.56 vs. 42.2; M. M. Gillis, Haaga, & Ford, 1995), it was similar to means in other studies of postpartum women (46.56 vs. 45.63) (Getch, 2011) though lower than the mean in a study of postpartum women who were actively seeking mental health treatment found a mean of 64.39, (Swanson, Pickett, Flynn, & Armitage, 2011) indicating the mean for the current study is not high for the population. Wellbeing is more challenging to compare to previous studies or the general population as this is a relatively new measure. Nonetheless, the means for the individual scales in this study are similar to the means obtained for the individual scales with the sample of new mothers used to create the measure (Jones et al., 2011), though the range is more limited (this sample had fewer people that were experiencing especially high levels of complaints related to wellbeing). Physical health issues mothers reported experiencing were similar to cited physical difficulties in other studies (Declercq et

al., 2009) and included having pain, having had to take antibiotics, having experienced urinary incontinence. The values obtained for the facets of mindfulness measured in the current study were similar to values obtained in studies containing similar samples. For example, in the present study, baseline and follow up levels of nonreactivity (21.72, 22.56) and nonjudgment (31.44, 28.57) were similar to the means obtained in a study of breastfeeding mothers (Nonreactivity, 19.77, 24.15; Nonjudgment, 27.62, 34.15) (Perez-Blasco, Viquer, Rodrigo, 2013), indicating that the current study was representative of similar populations in terms of mindfulness.

Study Findings

Examination of Hypotheses related to Differences between Mindfulness and Self-Affirmation. The combination of the two manipulation checks indicated that the participants did attempt to follow the instructions of their writing exercises. Coders were reliably able to tell with which condition the participants were in, though the coders reported that this was easiest in the first couple sentences of many of the writings, and became less clear as they read on. Participants' responses to the one-item manipulation checks indicated they attempted to follow the directions for their specific writing intervention at least half the time.

Negative and Positive Emotion. There was partial support for the first hypothesis, which held that participants in the mindfulness condition would use a higher percentage of negative emotion words during their writing, whereas those in the self-affirmation condition would use a higher percentage of positive words. Previous studies have found that those in an acceptance-enhanced writing condition, similar in theory and practice to the intervention in this study, used more negative

words than those in a traditional expressive writing paradigm (Baum & Rude, 2012). In line with these studies, those in the mindfulness condition had a significantly higher percentage of negative emotion words in their writing than those in the self-affirmation condition. This percentage was also slightly higher than the posted LIWC average for negative emotion words (1.89 vs. 1.83). The second half of the hypothesis was not supported, as those in the mindfulness condition versus the self-affirmation condition used a higher percentage of positive emotion words as well. The percentage used in the mindfulness condition was slightly lower than the LIWC average for positive emotion words (3.56 vs. 3.67). Though it was assumed that since participants in the self-affirmation condition would be focused on a positive aspect of themselves they would be using more positive emotion words, it may be that despite the positive focus this condition was somewhat restrictive in its focus whereas the mindfulness condition allowed for more discussion of any unrelated positive emotions that may have come to mind. For example, participants in the self-affirmation condition were instructed to think about the ways in which a specific value or characteristic they selected from a list of values and characteristics helped them cope during the transition to motherhood, whereas those in the mindfulness condition were essentially instructed to describe the feelings they had surrounding their experiences as a mother, whether good or bad. These differences in instructions may also have encouraged the participants in the self-affirmation condition to focus more on cognitions and the participants in the mindfulness condition to focus more on emotions.

It's also possible that the results from the LIWC analyses of these writings are somewhat misleading, as new mothers often report feeling significant pressure to

experience motherhood as a positive experience (Dennis & Chung-Lee, 2006; S J Lepore, Silver, Wortman, & Wayment, 1996) and report stigma related to negative feelings around motherhood (Dennis & Chung-Lee, 2006; J. A. Maloni et al., 2013). At times during the writing activities in this study, positive word usage was in the context of expressing these pressures, and/or describing aspects of the way their lives were before having a baby. For example, one mother wrote “I know I shouldn’t but I can’t stop thinking about how I was more relaxed and carefree before the baby came. I could spend quality time with my husband and go out to eat and do whatever I wanted. I didn’t appreciate the freedom then like I do now”, and another wrote “I do not like other new mothers I have met, I feel like they are all perfectly happy and content and have perfect lives and I can never admit anything is wrong with mine.” In these examples, words such as “relaxed” and “happy” did not represent current positive affect although they would be scored as such. Because the LIWC does not distinguish words used in these contexts from words that would portray positive affect, a more in depth analysis of the emotional intentions behind what was written may provide more accurate information.

Positive and negative affect was assessed immediately before and after the writing sessions using the PANAS, to see if participants’ reported levels of positive and negative affect would change over the course of the writing sessions for the mindfulness and self-affirmation conditions. There was not an overall change in positive or negative affect over the course of the study, but those in the mindfulness condition experienced a significant increase and then a decrease in negative affect over the 2nd and 3rd writing sessions, respectively, and a significant increase in

positive affect in all three writing sessions. In the self-affirmation condition there was only one significant difference in affect over the course of a writing session, an increase in positive affect during the first session. The findings for the mindfulness condition are not in line with some previous research that has found either a consistent reduction in negative affect after positive expressive writing interventions (Leary, Tate, Adams, Allen, & Hancock, 2007), or no significant effect at all (Zabelina & Robinson, 2010). It's possible that this is because previous studies were not focused on acceptance or mindfulness, which may be the unique quality that leads to a trend of increasing emotion over the course of the writing intervention.

Interactions between Nonreactivity, Nonjudgment and Condition. The third set of hypotheses focused on how individual differences in nonreactivity and nonjudgment may moderate the effectiveness of the different interventions. Contrary to hypotheses, nonjudgment and nonreactivity did not reliably moderate the relationship such that those in the mindfulness condition benefitted less from the interventions when low on these traits (i.e., more judgmental and reactive). Complicating these results was the finding that in all but one of the six interactions tested, baseline levels of the outcome measure interacted with either the condition or baseline levels of nonreactivity/nonjudgment or both to predict results.

Recent research has attempted to uncover the unique associations between depression, anxiety, and wellbeing with the individual facets of mindfulness, with both differing and overlapping results. For example, a recent study found that only nonreactivity (not nonjudgment) was inversely correlated with anxious arousal, whereas both nonreactivity and nonjudgment were inversely associated with

depressive symptoms. (Desrosiers, Vine, Klemanski, & Nolen-Hoeksema, 2013). Another study found *both* nonreactivity and nonjudgment predicted anxiety (Soysa & Wilcomb, 2013). This study also found that the nonjudgment facet of mindfulness was inversely associated with average wellbeing. In the current study, baseline levels of nonjudgment and nonreactivity were inversely correlated with both anxiety and depression (e.g., being more judgmental or reactive to inner experiences was associated with more symptoms of anxiety and depression), but not associated with overall wellbeing, though it's possible that the wellbeing measure was too diffuse to accurately capture this relationship. There was a wide range in inter-item reliability among the scales in this measure, with the lowest reliability in the "relationship with baby" scale. It's possible that reducing the number of subscales used or using a different measure of wellbeing would be more accurate. Again, these results are complicated, but what was clear was that baseline levels of distress and wellbeing interacted in intricate ways with these facets of mindfulness to predict outcomes.

In addition, I did not foresee the possibility that certain individual characteristics may lead clients to not only struggle in the mindfulness condition, but also the self-affirmation condition. For example, in the regression analyses examining baseline nonjudgment and condition as predictors in follow-up anxiety, for those in the self-affirmation condition there was a strong association between level of baseline nonjudgment and follow-up anxiety, such that as the tendency to judge inner experiences increased, follow-up anxiety scores also increased. Those in the mindfulness condition displayed the opposite pattern, with follow-up anxiety scores decreasing as judgment of inner experiences increased. It makes sense that someone

who is more judgmental of their inner experiences might have a difficult time with the requirements of the self-affirmation condition, which required thinking about their positive traits and how they have helped them as a mother.

Additional Analyses Comparing Mindfulness and Self-Affirmation. The question of which intervention is better is difficult to answer with these results, as it seems to be highly dependent on characteristics of the participants. Though there was an overall tendency for depression, anxiety, and postpartum health complaints to be higher at follow up in the mindfulness condition, individual characteristics of the participants including baseline levels of distress, wellbeing, nonreactivity, and nonjudgment, all influenced results in ways such that overall conclusions are difficult to make. Additional analyses comparing the two conditions without the moderators of nonreactivity and nonjudgment were conducted in an attempt to clarify differences in outcomes between conditions. Although participants in both conditions (as well as waitlist) had more complaints related to postpartum wellbeing at follow up than at baseline, regression analyses revealed the association between baseline complaints related to wellbeing and follow up complaints was stronger in the self-affirmation condition than the mindfulness condition. Examining the regression lines at low, mean, and high levels of complaints for the sample revealed that at low levels of baseline complaints there were more follow-up complaints in the mindfulness condition, but at high levels of baseline complaints there were more follow-up complaints in the self-affirmation condition. Another regression analysis revealed that baseline depression and condition interacted to predict outcome depression with a similar pattern, in that association between baseline and follow up depression was

larger in the self-affirmation condition. When baseline depression scores were one standard deviation below the obtained baseline mean for the sample, outcome depression was lower in the self-affirmation condition than the mindfulness condition, but there was no difference between depression outcomes between the two conditions at high levels of depression. Supporting the pattern that self-affirmation writing may be more beneficial than mindfulness writing at lower levels of depression, there was an increase in the percentage of participants who met the screening cutoff for depression in the mindfulness and waitlist conditions (from 33% to 55% and from 35% to 40%, respectively), but a decrease in the percentage for those in the self-affirmation condition (from 35% to 26%).

The mindfulness and self-affirmation conditions did not appear to differ for the outcome of anxiety. Condition had very little impact compared to baseline anxiety, and overall there was a slight increase in outcome anxiety for both conditions, with no significant difference between the two.

Differences between Treatment and Waitlist

Contrary to hypotheses, the writing conditions did not differ significantly from the waitlist conditions on overall outcomes of depression, anxiety, or wellbeing.

However, there was a significant positive association found between baseline and follow-up anxiety for those in the writing condition. There was a significant negative association found between baseline and follow-up anxiety in the waitlist condition.

The changes from baseline to follow-up anxiety were small in the writing condition (a decrease from an average of 37.18 to 36.58 at low baseline levels of anxiety and an increase from an average of 57.94 to 62.84 at high levels of baseline anxiety). These

changes were larger in the waitlist condition, as those who were low in baseline anxiety increased on average from 37.18 to 47.93 at follow up, and those who were high in baseline anxiety decreased on average from 57.94 to 43.17.

A relatively recent research study comparing expressive writing with a control condition on outcomes including depression, anxiety, and wellbeing, found similar results to this study, with no significant outcomes for writing conditions for anxiety, depression, or physical symptoms. However, this study found that emotional expressiveness moderated these results, in that participants low in expressiveness showed an increase in anxiety in the writing group (Niles, Haltom, Mulvenna, Lieberman, & Stanton, 2013).

Though measures of emotional expressiveness were not included in this study and thus cannot make such comparisons, considering the differences between conditions in affect expressed immediately after writing, and negative affect is common to both depression and anxiety symptoms (Moses & Barlow, 2006) which influenced the outcome variables, I conducted exploratory post-hoc mediation analyses to test affect as a possible mediator between the baseline and outcome measures. Mean negative affect measured immediately after writing sessions was found to mediate the relationship between baseline and follow-up anxiety and depression, thus higher post-session negative affect strengthened the positive association between baseline and follow-up measures of these variables. Expressive writing interventions may benefit participants more when participants experience lower levels of negative affect immediately after their writings. Although the current study did not find longer-term overall reductions in negative affect in either

condition, these results could nonetheless be useful in designing future interventions. The current study found significant increases in positive affect across each time point for the mindfulness condition, but positive affect was not found to mediate the relationships between baseline and follow-up for any of the outcome variables. Hence, a focus on reduction in negative affect may be particularly important focus for those designing positive expressive writing interventions.

The current study also tested whether participants in the mindfulness condition would report an increase in mindfulness at follow up. It was not expected that this would be the case, as previous research has not found increases in mindfulness (Moore et al., 2009; Poon & Danoff-Burg, 2011). It was found that there was a negligible mean gain in mindfulness scores for the mindfulness condition, a larger gain for the self-affirmation condition, and mean loss in scores for the waitlist condition. Once again, individual characteristics influenced these results, as there was a significant but very small interaction between baseline scores of mindfulness and condition, such that there was a larger negative association between baseline scores of mindfulness and mindfulness gain scores in the self-affirmation condition than the mindfulness condition, though neither of the slopes met the criteria for statistical significance. Regardless of condition, those with low baseline mindfulness had higher overall gain scores than those with high baseline mindfulness, with an increase in the self-affirmation condition and a negligible loss mindfulness condition. Those with high baseline mindfulness had a small mean loss in mindfulness score regardless of condition, with a greater loss in the mindfulness condition. The overall trend of gain for those with low baseline mindfulness and loss for those with high baseline

mindfulness might be explained by regression to the mean. However, differences between the conditions for those with low baseline levels of mindfulness are intriguing. It's also possible that perhaps there were aspects of the self-affirmation condition that involved unintentionally practicing some aspects of mindfulness without the task of sitting with uncomfortable emotions that comes with the mindfulness condition. For example, the remaining three facets in the five-facet mindfulness model, observing the present moment, describing present experiences and acting with awareness (Baer et al., 2006) would all be involved in the self-affirmation writing condition. When examining the differences in gains between the individual facets for mindfulness in this study, it was found that the largest gain in the self-affirmation condition was made in the "describing" facet, though the differences were not significant. There may be something about the self-affirmation writing that provides practice with describing inner experiences in ways that are superior to the mindfulness writing, at least for some participants or in short-term interventions. This may also be coincidental, and would need to be explored further before any conclusions could be drawn.

These results are difficult to summarize, as they seem to reflect participants' individual differences in complicated ways. It's clear that there is not an easy overall answer regarding which intervention was more helpful. It's also clear that nonreactivity and nonjudgment did seem to influence how participants experienced the interventions, as did baseline levels of distress and wellbeing. It is tempting to try to choose a superior or inferior writing exercise based on the results, but at this point this answer is dependent on too many individual characteristics to give a reliable

answer. One exception to this was the finding that the self-affirmation was the only condition in which a smaller rather than larger percentage of the participants met the cutoff for depression screening at follow-up compared to baseline measurements. Additionally, those in the self-affirmation condition had lower average depression outcomes than those in the mindfulness condition when baseline depression levels were low. These results indicate the possibility that self-affirmation may be better for outcome depression levels at least for those with lower levels of baseline depression.

In general, these results were not in line with previous research, which has found a range of small to medium effect sizes for expressive writing interventions on psychological health outcome variables (Frattaroli, 2006; Smyth, 1998) and physical health outcome variables such as infection, pain, urinary incontinence, and doctor visits (Frisina, Borod, & Lepore, 2004). It's possible that the lack of significant findings of improvement could be because of the population. Postpartum women seemed to fit into Solano's category of populations with whom expressive writing had the most promise, the category in which participants who had moderately stressful life events or disease but expected positive outcomes that tended to be within the participants control wrote about their situation. For example, these participants showed improvements like quicker recovery from surgery and fewer physical symptoms after successful breast cancer treatment (L. Solano et al., 2003; Stanton, 2002). Reading through the writings it became clear that for many of these women they did not feel as though they were in control of their situation, nor did they necessarily assume it was going to improve. In fact, many of them were mourning the loss of their previous lives and worrying about difficulties with their relationships and

career, even while describing the love and joy brought to them by their child. These results are somewhat similar to a 2013 study that explored how two different expressive writing conditions would compare to a control condition for participant recovering from marital separation (Sbarra, Boals, Mason, Larson, & Mehl, 2013). Participants had significantly higher scores on measures of depression and impact of the event in both expressive writing conditions compared to the control condition, in which participants were instructed to write detailed, accurate, and objective descriptions about how they spent their days. These results were predominantly driven by an interaction effect, in that participants who either rated highly on baseline scores of tendency to ruminate and whose writings were rated by coders as being high in search for meaning did significantly worse than those who were low in search for meaning in the expressive writing condition, and significant better than those who were low in search for meaning in the control condition. The authors proposed that perhaps the control writing allowed participants to re-engage in their daily routines more actively without focusing on their emotional pain, whereas expressive writing may increase an inward, ruminative response in those with these emotional patterns. Although these variables were not examined in the present study, this is interesting to consider in terms of women in the postpartum period, who have the difficult task of sorting out how to re-engage with the outside world when feeling isolated and incorporating all of the changes that come along with a new baby into their lives,.

Limitations and Future Directions

There were a number of limitations to this study that should be considered when considering the results. One of these is the use of only self-report measures,

which include only what the participant is aware of and willing to report although this is the norm in expressive writing studies. The pressure on new mothers to enjoy their experience and only report positive aspects of parenting (Dennis & Chung-Lee, 2006; S J Lepore, Silver, Wortman, & Wayment, 1996) could still influence anonymous measures. The ideal of being a good mother is likely not only to influence what people say to others, but what they say to themselves. Thus, measures of self-reported symptoms of depression, anxiety, or complaints related to wellbeing may be somewhat inaccurate in that they may depict more of what participants think they should be feeling or wish they were feeling than what they are actually experiencing. To more accurately describe the emotions portrayed in the writings, future studies could perform a more in depth analysis of the emotional intentions behind what was written in order to assess the context in which positive and negative emotion words are expressed.

Though the attrition in this study was not atypical for this type of study, it was still somewhat high. Future studies could do more individualized follow-ups with participants, and include more reminders via email about participating for those who may have forgotten. Additionally, there was attrition between the stages of completing the third writing exercise and the follow-up measures, meaning that some participant completed everything but the very last component of the study. It is possible that directions did not adequately convey that the writing portion of the study was complete. Future researchers may wish to administer outcome measures immediately after the third writing session, and then again at a later time to increase

the number of participants that had follow-up measures, even if the timing was not ideal.

Another limitation to this study is the relatively homogenous sample in terms of age, level of education, and financial status. Because this sample was relatively well educated, financially solvent, and established, they may have more opportunities to receive other means of support through parenting groups and pre-established communities. New mothers with less financial means and lower education status may lack access to these resources and benefit more from an intervention such as this one.

This was likely related to the recruitment method used, in that many of the respondents were recruited from listservs, which may have had a limited range in these categories. Additionally, the method through which individual participants were recruited was not tracked in any way. Because of this it is impossible to say with any certainty if most of the sample recruited has these demographics because it is more likely that women within these demographic categories would participate in an online writing intervention, or because these are the women who were reached based on the specific listservs they belonged to, limiting the chances of a more diverse sample. Future studies could address this by asking participants to fill in how they were recruited, and the state in which they live. Additionally, future studies could avoid private listservs as a means of recruitment, and use only public notices, or snowball sampling.

Methodological limitations in the present study also detract from the meaningfulness of the results of the analyses of interaction effects. Although power was considered during the design of this study, the tests of moderation suffered from

insufficient power and a large family-wise error rate. In addition, the results did not follow a pattern that could be supported theoretically, and the effect sizes were usually negligible.

There were also limitations in the way the directions were written. The directions for the writing conditions were fairly long, especially the mindfulness conditions. Though this may have had the positive effect of participants generally understanding and following the directions, participants also sometimes wrote of being irritated by the length of the directions, especially during the mindfulness condition. One way to address this issue would be to make the three different interventions differ from each other in a progressive matter, so that each time participants were adding a new element of mindfulness to focus on. The length of the instructions were intended to give as much information as possible to the participants regarding how to approach the task in a mindful manner, but this may have had the unintended effect of not only seeming repetitive, but also overwhelming and unattainable, especially for those who did not have previous experience practicing mindfulness. This irritation could have influenced the way this participant experienced the intervention, and thus prevented them from benefiting from it as much as they could have. Although in the current study volunteers were recruited to read the directions and participate in the writing interventions to see if they would understand and follow the directions, their emotional reactions or possible frustration with the directions was not addressed. Future studies could ask about this during pilot studies, and compare test participants who have had mindfulness experience with those who have not, and how they react to the interventions.

Future studies could also measure not only post-session affect but baseline measures of emotional expressivity, in order to test the idea proposed by another study (Niles et al., 2013) and supported by this one that the emotional expression required by some forms of expressive writing may be more helpful for some individuals than others, and also to test which forms of expressive writing lead to more emotional expression. This is another area in which future researchers could benefit from conducting more in depth analyses of the writing, in that it may reveal common factors in writing that were associated with decreases in negative affect.

Finally, future research attempting to explore how baseline levels of these facets of mindfulness influence the effectiveness of a mindfulness expressive writing condition may benefit from comparing a mindfulness or acceptance condition to one that does not require self-affirmation, as the process of self-affirmation may have been equally difficult for those who were high in judgment and reactivity as the mindfulness condition. Self-Affirmation may also have been difficult for new mothers in general, as during the first year mothers may be questioning their competence as parents and this may fluctuate during the baby's first year, and thus they may struggle with writing about how a certain value or characteristic has helped them during the transition to motherhood.

Conclusion

This study is the first to explore expressive writing as way of improving the emotional and physical health of mothers in the postpartum period, a time when mothers may face significant barriers to seeking help. The ways in which baseline measures of distress and wellbeing influenced outcomes in this study underlie the

importance of considering the varying levels of wellbeing and disparate experiences of new mothers, which previous research has often failed to account for (Hoffenaar et al., 2010). This study did not find nonjudgment and nonreactivity to inner experiences, the two facets of mindfulness examined, to moderate the effectiveness of a mindfulness based expressive writing intervention in reliable ways. It also did not find reliable overall differences in outcomes between those in the writing and waitlist conditions or between the two writing conditions.

It is possible that this current population is very different at its core from a number of the populations expressive writing has been found to be effective with in which participants are recovering from a distressing event or illness. In those populations, the experiences the participants had are finished, even if some emotional effects are still there. In this population, the immediate distress that may have been caused by childbirth, physical symptoms, and lack of sleep may fade over the first months of parenthood, but the full realization and recognition of how much life has changed may just be setting in. Also, as babies grow over the first year, some aspects of parenthood may get easier (e.g. sleep may improve), but there are always new challenges as the baby develops and life circumstances change. Infants may go through stages that make parenting more difficult over the first year such as teething, colic, and sleep difficulties. Additionally, life circumstances such as returning to work and finding childcare can bring new complications as the year progresses. In addition, before having a child expectant parents may focus predominantly on the positive changes having children will bring to their lives and thus the parts that may be more difficult, i.e., the restrictions to freedom, financial burdens, and possible changes to

romantic relationships may take longer to fully recognize and accept. In support of these ideas, the mean depression and anxiety scores for the sample in the current study did not decrease between 3-4 months postpartum and 9 and 10 months postpartum. In fact, they slightly increased. One promising finding from the current study is the contributing influence of post-session negative affect to outcome anxiety and depression. Future researchers considering this population may benefit from designing their interventions with the specific intention of reducing negative affect experienced immediately afterward their writing interventions.

Appendix A - Recruitment Notice

Online Study for New, First-time Mothers

Are you a new mother of a child between the ages of two weeks and ten months? Do you wish you had more opportunities to express the concerns or worries about your child, your relationship, or the changes in your life due to becoming a mother?

You may be eligible for an online study that explores how writing affects the way women experience the transition to first-time parenthood. Our hope is that this will provide valuable information on women's wellbeing during this transition, as well as ways to improve it.

This study is conducted online, and consists of two surveys and three writing exercises. If you choose to take part in the study, after completing the first survey you will complete three writing exercises over the course of ten days, and a very brief follow-up survey in approximately six weeks. In total, this study is anticipated to require between 1.5 and 2 hours of your time.

By completing the entire study you can be eligible to win one of five \$50 Amazon gift-certificates. This research is being conducted by Sara Ericson, M.S. and Mary Ann Hoffman, Ph.D, professor and co-director of the counseling psychology program at the University of Maryland, College Park.

If and when you would like to participate in this research, please cut and paste the link below into your browser. It will lead you to an initial survey that should take between 10 and 15 minutes to complete.

[Click here to take initial survey](#)

Thank you!

Sara K. Ericson, M.S.
Doctoral Candidate
Counseling Psychology
University of Maryland, College Park
sericson at umd.edu

Mary Ann Hoffman, Ph.D
Professor and Co-Director
Counseling Psychology
University of Maryland, College Park

Appendix B – Consent Form

Project Title	The Effects of Expressive Writing on Postpartum Wellbeing
Purpose of the Study	This research is being conducted by Sara Ericson and Mary Ann Hoffman at the University of Maryland, College Park. We are inviting you to participate in this research project because you are at least 18 years of age and have given birth between six weeks and ten months ago. The purpose of this research project is to explore the effects of writing about your experiences as mother.
Procedures	<p>This is an online study. You will be randomly assigned to one of two writing conditions or a waitlist control condition. In all conditions, you will be asked to complete measures about your physical health, emotional health, and your wellbeing twice; once in the beginning of the study and again approximately six weeks later. Examples of questions/statements you may be asked are “It is really interesting to watch my baby develop” and “I have been anxious or worried for no good reason.”</p> <p>If you are assigned to a writing condition, in approximately one week you will be asked to write about your experiences, thoughts, and feelings related to being a mother for 15 minutes, three times over the course of a ten-day period. You will also be asked to complete a short survey directly before and after each writing session.</p> <p>If you are assigned to the waitlist control condition you will be given the opportunity to participate in the writing activities in approximately six weeks, but this is not required.</p> <p>In total, this study is anticipated to require between 1.5-2 hours of your time.</p>
Potential Risks	There may be some risks from participating in this

<p>and Discomforts</p>	<p>research study. You may have both positive and negative feelings about your experiences as a mother, and writing about negative feelings may induce feelings of discomfort or sadness. There is also the risk of accidental disclosure if you do not complete the intervention in a private location and someone overhears your responses. There will be no one monitoring your writing on a regular basis and there will be no one giving you feedback on your writing. If for any reason you feel you need to contact the researchers, you can do so at sericson at umd.edu If you feel distress at any point during the study and require immediate assistance you can contact the National Suicide Prevention Lifeline at 1800-273-8255 or http://www.suicidepreventionlifeline.org. Additionally, the American Psychological Association's Psychologist Locator at locator.apa.org can help you find a trained and practicing psychologist in your area.</p>
<p>Potential Benefits</p>	<p>There are no direct benefits to participating in this study. However, you may better understand your feelings and thoughts about being a mother after writing about your experiences. We hope that, in the future, other people might benefit from this study through improved understanding of what can be helpful for women in the postpartum period.</p>
<p>Confidentiality</p>	<p>The research team will minimize any potential loss of confidentiality by storing data in a locked office and password protected computer. Moreover, your identifying information will not be linked to your survey or written responses. Only members of the research team will have access to your responses. If we write a report or article about this research project, your identity will be protected to the maximum extent possible. Your information may be shared with representatives of the University of Maryland, College Park or governmental authorities if you or someone else is in danger or if we are required to do so by law.</p>

Compensation	At the end of the study, you will be entered into a raffle to win one of five \$50 Amazon gift cards. If you win, your gift card will be sent to the email address you provided during the study. You will be responsible for any taxes assessed on the compensation.
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Check here if you expect to earn \$600 or more as a research participant in UMCP studies in this calendar year. You must provide your name, address and SSN to receive compensation.

Check here if you do not expect to earn \$600 or more as a research participant in UMCP studies in this calendar year. Your name, address, and SSN will not be collected to receive compensation.

Crisis Contact Information	If you are now or ever in crisis, you can contact the National Suicide Prevention Hotline 24 hours a day, 7 days a week, by online chat at http://www.suicidepreventionlifeline.org/ or by phone at 1-800-273-8255(TALK) .
Right to Withdraw and Questions	<p>Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. However, your name will be entered into the drawing only at the completion of the study. If you are assigned to the waitlist control group, you will be entered into the drawing regardless of whether you participate in the writing activities after the study.</p> <p>If you decide to stop taking part in the study, if you have questions, concerns, or complaints, please contact the investigator, Sara Ericson, at 2147H, Biology-Psychology Building, University of Maryland, College Park, MD 20742, sericson at umd.edu.</p>
Participant Rights	<p>If you have questions about your rights as a research participant or wish to report a research-related injury, please contact:</p> <p style="text-align: center;">University of Maryland College Park Institutional Review Board Office</p>

	<p>1204 Marie Mount College Park, Maryland, 20742 E-mail: irb@umd.edu Telephone: 301-405-0678</p>
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This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.

Appendix C - Eligibility Criteria

(*=does not meet eligibility)

1. Are you a woman at least 18 years old? Yes ___ No* ___
2. Are you able to read and write in English? Yes ___ No* ___
3. Did you give birth between six weeks and ten months ago? Yes ___ No* ___
4. Is this your first child? Yes ___ No* ___
5. Have you experienced suicidal thoughts since giving birth? Yes* ___ No ___

If participants are ineligible

Thank you for your interest in this study. In order to participate in this study, it is important to meet specific inclusion criteria. Due to these conditions, we regret to inform you that we cannot take you as a participant at this time. If for any reason you feel you need to contact the researchers, you can contact the investigator, Sara Ericson at sericson at umd.edu. If you are in crisis and need immediate assistance, you can contact the National Suicide Prevention Lifeline at 1800-273-8255 or <http://www.suicidepreventionlifeline.org>. If you would like to seek outside counseling, you can contact locator.apa.org to find a trained and practicing psychologist in your area.

Appendix D - Demographics

1. Please enter the email address you would prefer us to use when contacting you for this study. _____
2. Are you a resident of the United States? _____
 - a. If no, please write your country of residency _____.
3. What is your age? _____
4. What was your child's date of birth? _____
5. With which ethnic background(s) do you identify most strongly? (Mark all that apply)

_____ African-American	_____ Native American/Native
_____ Asian-American/Pacific Islander	_____ Alaskan
_____ Indian	_____ European American
_____ Latin American	_____ Other (please specify):
_____ Middle Eastern	_____
6. What is your highest level of education completed?

_____ Grade school/Junior	_____ Associate's Degree
High	_____ Bachelor's Degree
_____ High School	_____ Graduate Degree
_____ Some College	
7. What is your employment status? (check **all** that apply)

Not employed (unrelated to pregnancy/giving birth) _____

Full-time employee or student _____

Part-time employee or student _____

No longer employed since giving birth _____

Working at home _____

Working outside of the home _____

On paid family leave _____

On unpaid family leave _____
8. What is your annual household income (before taxes?)

_____ Under \$20,000
_____ Between \$20,001 and \$40,000
_____ Between \$40,001 and \$60,000
_____ Between \$60,001 and 100,000
_____ Above 100,000

What is your relationship status?

- _____ Married/Civil Union/Domestic Partnership (___years ___months)
- _____ In a long term relationship (___years ___months)
- _____ Divorced
- _____ Widowed
- _____ Single

9. If you are married or have a live-in partner, what is your partner's employment status? (check **all** that apply)

- Not employed (unrelated to pregnancy/birth of child) _____
- Full-time employee or student _____
- Part-time employee or student _____
- No longer employed since birth of child _____
- Working at home _____
- Working outside of the home _____
- On paid family leave _____
- On unpaid family leave _____

10. Are you currently seeing a mental health professional for counseling or therapy?

- Yes ___ No ___
- a. If yes, for how long? _____
- b. What type of therapy? _____

11. Are you currently taking prescription medication to address a psychological or mood disorder?

- Yes ___ No ___
- a. If yes, which medication(s)? _____
- b. For how long? _____

If you are in crisis and need immediate assistance or a referral to therapists in your area, you can contact the National Suicide Prevention Lifeline at 1-800-273-8255 or <http://www.suicidepreventionlifeline.org>.

Appendix E - Mother's Postnatal Health Instrument

Please select the option that most accurately describes your experiences since giving birth.

		Never	Rarely	Sometimes	Often	Always
1	I really love being a mother	0	1	2	3	4
2	It is really interesting to watch my baby develop	0	1	2	3	4
3	I am having fun with my baby	0	1	2	3	4
4	I have developed a close bond with my baby	0	1	2	3	4
5	Spending time with other moms and babies makes me happy	0	1	2	3	4
6	Going out and seeing other people makes me feel happy	0	1	2	3	4
7	I have received good support from my circle of friends	0	1	2	3	4
8	I get support from other mothers with babies	0	1	2	3	4
9	I have become closer to my friends	0	1	2	3	4
10	I am developing new friendships	0	1	2	3	4
11	Looking after my baby has been hard work and no pleasure	0	1	2	3	4
12	I am trapped because getting out of the house is such a hassle	0	1	2	3	4
13	I am not in control because my baby's needs take over	0	1	2	3	4
14	I am frustrated because what I do now is structured around my baby	0	1	2	3	4

15	My life before my baby was born has been taken away from me	0	1	2	3	4
16	I am on a roller coaster ride as my moods have been up and down	0	1	2	3	4
17	I am angry	0	1	2	3	4
18	I am irritable	0	1	2	3	4
19	I am downhearted and low	0	1	2	3	4
20	I am weepy and tearful	0	1	2	3	4
21	I am unhappy about myself	0	1	2	3	4
22	Getting to know my baby has been difficult	0	1	2	3	4
23	I am unsure of who I am	0	1	2	3	4
24	I am worthless	0	1	2	3	4
25	I am daunted by the future	0	1	2	3	4
26	I am numb towards my baby	0	1	2	3	4
27	I am tired because I am not getting enough sleep	0	1	2	3	4
28	I cannot cope with the tiredness	0	1	2	3	4
29	I am drained of energy	0	1	2	3	4
A1	I have felt closer to my parents	0	1	2	3	4
A2	I have felt that I get the support I need from my parents	0	1	2	3	4
A3	I have felt that I see our family more often now	0	1	2	3	4
A4	I have felt that my family is supportive	0	1	2	3	4
B1	I have felt frustrated because breastfeeding prevents me going out as much as I would like	0	1	2	3	4

B2	I have felt that because of breastfeeding my body has not felt like my own	0	1	2	3	4
B3	I have felt that breastfeeding make my partner see me as nothing other than a mom	0	1	2	3	4
B4	I have had cracked and painful nipples and dreaded every single feed	0	1	2	3	4
C1	I have experienced pain	0	1	2	3	4
C2	I have had problems with incontinence (urinary)	0	1	2	3	4
C3	I have had problems with incontinence of bowel movements	0	1	2	3	4
C4	I have had an infection	0	1	2	3	4
C5	I have had to take antibiotics	0	1	2	3	4
C6	I have had to seek medical advice about my health	0	1	2	3	4
D1	The relationship has suffered because my partner has struggled to adapt to the life change	0	1	2	3	4
D2	My partner and I argue	0	1	2	3	4
D3	The different views my partner and I have about our baby has caused problems between us	0	1	2	3	4
D4	I have wanted to push my partner away	0	1	2	3	4
E1	I would like to have sex but I am too tired	0	1	2	3	4

E2	I am not having sex because I do not feel attractive	0	1	2	3	4
E3	I am worried that my sex life will not return to how it was before the baby was born	0	1	2	3	4

Appendix F - Penn State Worry Questionnaire

(Meyer, Miller, Metzger, & Borkovec, 1990)

Instructions: Rate each of the following statements based on how you have been feeling **over the last two weeks** on a scale of 1 (“not at all typical of me”) to 5 (“very typical of me”). Please do not leave any items blank.

	Not at all typical		Somewh at Typical		Very Typical
1. If I do not have enough time to do everything I do not worry about it	1	2	3	4	5
2. My worries overwhelm me	1	2	3	4	5
3. I do not tend to worry about things	1	2	3	4	5
4. Many situations make me worry	1	2	3	4	5
5. I know I should not worry about things but I just cannot help it.	1	2	3	4	5
6. When I am under pressure I worry a lot.	1	2	3	4	5
7. I am always worrying about something.	1	2	3	4	5
8. I find it easy to dismiss worrisome thoughts.	1	2	3	4	5
9. As soon as I finish one task, I start to worry about everything else I have to do.	1	2	3	4	5
10. I never worry about anything.	1	2	3	4	5
11. When there is nothing more I can do about a concern, I do not worry about it anymore.	1	2	3	4	5

12. I have been more worried this past week.	1	2	3	4	5
13. I notice that I have been worrying about things.	1	2	3	4	5
14. Once I start worrying, I cannot stop.	1	2	3	4	5
15. I worry all the time.	1	2	3	4	5
16. I worry about projects until they are done.	1	2	3	4	5

Appendix G - Five-Facet Mindfulness Questionnaire

(Baer et al., 2006)

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you

		Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true
1	When I'm walking, I deliberately notice the sensations of my body moving.	1	2	3	4	5
2	I'm good at finding words to describe my feelings.	1	2	3	4	5
3*	I criticize myself for having irrational or inappropriate emotions.	1	2	3	4	5
4	I perceive my feelings and emotions without having to react to them.	1	2	3	4	5
5*	When I do things, my mind wanders off and I'm easily distracted.	1	2	3	4	5
6	When I take a shower or bath, I stay alert to the sensations of water on my body.	1	2	3	4	5
7	I can easily put my beliefs, opinions, and expectations into words.	1	2	3	4	5

8*	I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.	1	2	3	4	5
9	I watch my feelings without getting lost in them.	1	2	3	4	5
10*	I tell myself I shouldn't be feeling the way I'm feeling.	1	2	3	4	5
11	I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.	1	2	3	4	5
12*	It's hard for me to find the words to describe what I'm thinking.	1	2	3	4	5
13*	I am easily distracted.	1	2	3	4	5
14*	I believe some of my thoughts are abnormal or bad and I shouldn't think that way.	1	2	3	4	5
15	I pay attention to sensations, such as the wind in my hair or sun on my face.	1	2	3	4	5
16*	I have trouble thinking of the right words to express how I feel about things.	1	2	3	4	5
17*	I make judgments about whether my thoughts are good or bad.	1	2	3	4	5

18*	I find it difficult to stay focused on what's happening in the present	1	2	3	4	5
19	When I have distressing thoughts or images, I 'step back' and am aware of the thought or image without getting taken over by it.	1	2	3	4	5
20	I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.	1	2	3	4	5
21	In difficult situations, I can pause without immediately reacting.	1	2	3	4	5
22*	When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.	1	2	3	4	5
23*	It seems I am 'running on automatic' without much awareness of what I'm doing.	1	2	3	4	5
24	When I have distressing thoughts or images, I feel calm soon after.	1	2	3	4	5
25*	I tell myself that I shouldn't be thinking the way I'm thinking.	1	2	3	4	5

26	I notice the smells and aromas of things.	1	2	3	4	5
27	Even when I'm feeling terribly upset, I can find a way to put it into words.	1	2	3	4	5
28*	I rush through activities without being really attentive to them.	1	2	3	4	5
29	When I have distressing thoughts or images I am able just to notice them without reacting.	1	2	3	4	5
30	I think some of my emotions are bad or inappropriate and I shouldn't feel them.	1	2	3	4	5
31	I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.	1	2	3	4	5
32	My natural tendency is to put my experiences into words.	1	2	3	4	5
33	When I have distressing thoughts or images, I just notice them and let them go.	1	2	3	4	5
34	I do jobs or tasks automatically without being aware of what I'm doing.	1	2	3	4	5

35*	When I have distressing thoughts or images, I judge myself as good or bad, depending on what the thought/image is about.	1	2	3	4	5
36	I pay attention to how my emotions affect my thoughts and behavior.	1	2	3	4	5
37	I can usually describe how I feel at the moment in considerable detail.	1	2	3	4	5
38*	I find myself doing things without paying attention.	1	2	3	4	5
39*	I disapprove of myself when I have irrational ideas.	1	2	3	4	5

*=reverse scored

Appendix H - Edinburgh Postnatal Depression Scale

Please answer the following questions in relation to how you have been feeling during the past **7 days**:

1. I have been able to laugh and see the funny side of things

- As much as I always could
- Not quite so much now
- Definitely not so much now
- Not at all

2. I have looked forward with enjoyment to things

- As much as I ever did
- Rather less than I used to
- Definitely less than I used to
- Hardly at all

*3. I have blamed myself unnecessarily when things went wrong

- Yes, most of the time
- Yes, some of the time
- Not very often
- No, never

4. I have been anxious or worried for no good reason

- No, not at all
- Hardly ever
- Yes, sometimes
- Yes, very often

*5. I have felt scared or panicky for no very good reason

- Yes, quite a lot
- Yes, sometimes
- No, not much
- No, not at all

*6. Things have been getting on top of me

- Yes, most of the time I haven't been able to cope at all
- Yes, sometimes I haven't been coping as well as usual
- No, most of the time I have coped quite well
- No, I have been coping as well as ever

*7. I have been so unhappy that I have had difficulty sleeping

- Yes, most of the time
- Yes, sometimes
- Not very often
- No, not at all

*8. I have felt sad or miserable

- Yes, most of the time
- Yes, quite often
- Not very often
- No, not at all

*9. I have been so unhappy that I have been crying

- Yes, most of the time
- Yes, quite often
- Only occasionally
- No, never

*10. The thought of harming myself has occurred to me

- Yes, quite often
- Sometimes
- Hardly ever
- Never

Appendix I - Initial Email for Writing Conditions

Hello!

Thank you again for your willingness to participate in my study on new motherhood. We recognize how busy new moms are and appreciate both your time and effort. You have been randomly assigned to one of two types of writing exercises. Near the bottom of this page you will see three links, (Day 1, Day 2, and Day 3). Each one will take you to some survey questions and a writing exercise. The writing exercises take fifteen minutes and the surveys take between one and three minutes.

Traditionally, these exercises are done completed at least one day apart. We understand that life as a parent can limit available time, and ask that you complete them at your convenience within the next ten days, making sure each one is completed at least one day apart. You will be sent email reminders to complete the interventions.

Your writing and survey responses will be separated from your email address and kept in a locked office in a password-protected folder. Please note that no one on the research team will be reading your writing on a regular basis, and that your writing will not be stored in connection with your contact information. If for any reason you feel you need to contact the researchers, please do so at sara dot ericson at umd.edu.

To begin, click on the link titled “Day 1” below. When you are ready to complete the second exercise, please return to this email and click on “Day 2”, and for the third, “Day 3”.

Thank you again,
Sara Ericson and Mary Ann Hoffman

Day 1 Link

Day 2 Link

Day 3 Link

Appendix J - Initial Email for Waitlist Condition

Part 2: Research Study on Writing and Wellness for New Moms

Hello!

Thank you again for your willingness to participate in my study on new motherhood. I recognize how busy new moms are and appreciate both your time and effort. You have been randomly assigned to a waitlist control condition.

In approximately five weeks, you will be asked to fill out another survey. Over the next five weeks you will receive weekly check-in emails as a reminder of this upcoming survey. Once you participate in the survey you will be eligible for the drawing. You will then be given the opportunity to participate in one of the writing exercises. Your participation in these exercises is completely optional and will not impact your eligibility for the drawing.

Please cut and paste the link below to complete a very brief four-item survey, which should take you less than two minutes to complete. Again, we will contact you each week for the next five weeks. Please contact sara dot ericson at umd.edu if you have any questions or trouble with the survey.

Appendix K - Expectation of Improvement for Treatment Conditions

Based on the Credibility and Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000)

We would like you to indicate below how much you believe, right now, that the exercises in which you will participate as part of this experiment will improve your wellbeing. Belief usually has two aspects to it: (1) what one thinks will happen and (2) what one feels will happen. Sometimes these are similar; sometimes they are different. Please answer the questions below. For the first two questions, answer in terms of what you think. In the second set answer in terms of what you really and truly feel.

	Not at all successful				Somewhat successful				Very successful
How successful do you think this exercise will be at improving your wellbeing?	1	2	3	4	5	6	7	8	9
	Not at all better				Somewhat better				Extremely better
At the end of this exercise, how much better do you think you will feel?	1	2	3	4	5	6	7	8	9

Now close your eyes for a moment and try to access how you really feel at this moment before answering the following questions.

	Not at all successful				Somewhat successful				Very successful
At this point, how successful do you <i>feel</i> this exercise will be at improving your wellbeing?	1	2	3	4	5	6	7	8	9
	Not at all better				Somewhat better				Extremely better
At the end of this exercise, how much better do you <i>feel</i> you will be?	1	2	3	4	5	6	7	8	9

Appendix L - Expectation of Improvement for Waitlist Control Condition

Based on the Credibility and Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000)

We would like you to indicate below how much you believe, right now, that the passage of time over approximately the next month will improve your wellbeing. Belief usually has two aspects to it: (1) what one thinks will happen and (2) what one feels will happen. Sometimes these are similar; sometimes they are different. Please answer the questions below. For the first two questions, answer in terms of what you think. In the second set answer in terms of what you really and truly feel.

	Not at all successful				Somewhat successful				Very successful
At this point, how successful do you think the passage of time will be at improving your wellbeing over the next five weeks?	1	2	3	4	5	6	7	8	9
	Not at all better				Somewhat better				Extremely better
In approximately five weeks, how much better do you think you will feel?	1	2	3	4	5	6	7	8	9

Now close your eyes for a moment and try to access how you really feel at this moment before answering the following questions.

	Not at all successful				Somewhat successful				Very successful
At this point, how successful do you <i>feel</i> the passage of time will be at improving your wellbeing over the next five weeks?	1	2	3	4	5	6	7	8	9
	Not at all better				Somewhat better				Extremely better
Approximately	1	2	3	4	5	6	7	8	9

five weeks from now, how much better do you <i>feel</i> you will be?									
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Appendix M Positive and Negative Affect Schedule – Short Form

(administered before and after each writing intervention) (Short PANAS; Kercher, 1992)

Directions: This scale consists of a number of words that describe different feelings and emotions. Read each item and then choose the appropriate answer next to that word. Indicate to what extent you feel this way right now.

	Very slightl y or not at all	A little	Moderate ly	Quite a bit	Extremel y
1. Inspired	1	2	3	4	5
2. Afraid	1	2	3	4	5
3. Alert	1	2	3	4	5
4. Upset	1	2	3	4	5
5. Excited	1	2	3	4	5
6. Nervous	1	2	3	4	5
7. Enthusiastic	1	2	3	4	5
8. Scared	1	2	3	4	5
9. Determined	1	2	3	4	5
10. Distressed	1	2	3	4	5

Appendix N - Mindfulness Interventions - Day 1

Before you begin this exercise, please do your best to be sure you will likely have the next fifteen minutes to yourself. If possible, complete this exercise when you have help or outside care for your child, or when your child is asleep. It is best if you are able to complete this writing session from start to finish uninterrupted. It may help to use some sort of timer such as <http://www.online-stopwatch.com/> so that you do not need to be concerned about the time as you write.

We are often lost in thought, fantasizing about possible good outcomes, worrying about whether or not we will be able to handle something, obsessing about mistakes we have made or things we wish we would have said. Additionally, we often judge ourselves harshly and label thoughts and feelings as “bad” or “good”. When we experience life changes, such as the transition to parenthood, these tendencies can become worse. For example, new mothers often report feeling anxious or experiencing worries about their child or themselves.

The point of this exercise is to take a step back from becoming caught up in all of the worries and fantasies about the past and the future, and experience the present moment. Please recognize that the point of this is NOT to rid your mind of thoughts, but to become aware of them without becoming caught up in them. It may be helpful to imagine your thoughts as clouds that you are watching float by, observing them but not judging them as good or bad.

Before you begin writing, take a few slow and deep breaths. When you begin writing, please start by describing the feelings you have surrounding your experiences as a mother, whether they are good or bad. This could include pregnancy and giving birth, your relationship with your child, or how this transition has impacted you, your career, or your relationships with loved ones. As you continue to write, try to remain aware and accepting of how you are feeling, both physically and emotionally.

It may help to focus on your breathing, or the sounds and physical sensations you’re experiencing. The same thought or feeling “cloud” is likely to return repeatedly. When this happens, take note of this and allow it to pass again. If you notice you are feeling anxious, allow yourself to experience the feeling and allow it to pass. The point is not to attempt to suppress any thoughts or feelings, but to observe and label them and let them go.

As you write, do not worry about grammar, spelling, or style. Don’t worry about deleting. The only rule is that once you begin writing, please continue to write until the 15 minutes has passed. If you run out of things to say, just repeat what you have already written. Finally, recognize that avoiding becoming caught up in and judgmental of our thoughts and feelings is difficult, and the value of this process is in the attempt, not the outcome.

Mindfulness Intervention – Day 2

Today you will be continuing to write in the same way you wrote in your last session. You may write about the same specific topics, or you may write about new

topics pertaining to your feelings about becoming a mother. Again, before you begin writing please do your best to be sure you will likely have the next fifteen minutes to yourself. Again, it may help to use some sort of timer such as <http://www.online-stopwatch.com/> so that you do not need to be concerned about the time as you write. Please see below for a reminder of the instructions.

The point of this exercise is to take a step back from becoming caught up in all of the worries and fantasies about the past and the future, and experience the present moment. Please recognize that the point of this is NOT to rid your mind of thoughts, but to become aware of them without becoming caught up in them. It may be helpful to imagine your thoughts as clouds that you are watching float by, observing them but not judging them as good or bad.

Before you begin writing, take a few slow and deep breaths. When you begin writing, please start by describing the feelings you have surrounding your experiences as a mother, whether they are good or bad. This could include pregnancy and giving birth, your relationship with your child, or how this transition has impacted you, your career, or your relationships with loved ones. As you continue to write, try to remain aware and accepting of how you are feeling, both physically and emotionally.

It may help to focus on your breathing, or the sounds and physical sensations you're experiencing. The same thought or feeling "cloud" is likely to return repeatedly. When this happens, take note of this and allow it to pass again. If you notice you are feeling anxious, allow yourself to experience the feeling and allow it to pass. The point is not to attempt to suppress any thoughts or feelings, but to observe and label them and let them go.

As you write, do not worry about grammar, spelling, or style. Don't worry about deleting. The only rule is that once you begin writing, please continue to write until the 15 minutes has passed. If you run out of things to say, just repeat what you have already written. Finally, recognize that avoiding becoming caught up in and judgmental of our thoughts and feelings is difficult, and the value of this process is in the attempt, not the outcome.

Mindfulness Intervention – Day 3

This is your final writing session. Again you may continue to write about the same specific topics or you may write about new topics pertaining to your feelings about becoming a mother. Again, before you begin writing please do your best to be sure you will likely have the next fifteen minutes to yourself. Again, it may help to use some sort of timer such as <http://www.online-stopwatch.com/> so that you do not need to be concerned about the time as you write. Please review the instructions below.

The point of this exercise is to take a step back from becoming caught up in all of the worries and fantasies about the past and the future, and experience the present moment. Please recognize that the point of this is NOT to rid your mind of thoughts, but to become aware of them without becoming caught up in them. It may

be helpful to imagine your thoughts as clouds that you are watching float by, observing them but not judging them as good or bad.

Before you begin writing, take a few slow and deep breaths. When you begin writing, please start by describing the feelings you have surrounding your experiences as a mother, whether they are good or bad. This could include pregnancy and giving birth, your relationship with your child, or how this transition has impacted you, your career, or your relationships with loved ones. As you continue to write, try to remain aware and accepting of how you are feeling, both physically and emotionally.

It may help to focus on your breathing, or the sounds and physical sensations you're experiencing. The same thought or feeling "cloud" is likely to return repeatedly. When this happens, take note of this and allow it to pass again. If you notice you are feeling anxious, allow yourself to experience the feeling and allow it to pass. The point is not to attempt to suppress any thoughts or feelings, but to observe and label them and let them go.

As you write, do not worry about grammar, spelling, or style. Don't worry about deleting. The only rule is that once you begin writing, please continue to write until the 15 minutes has passed. If you run out of things to say, just repeat what you have already written. Finally, recognize that avoiding becoming caught up in and judgmental of our thoughts and feelings is difficult, and the value of this process is in the attempt, not the outcome.

Appendix O - Manipulation Check – Mindfulness Condition

	Not at all accepting		Slightly accepting		Somewhat accepting		Pretty accepting		Very accepting
During your writing today, how accepting did you feel about the thoughts and feelings that occurred as you were writing?	1	2	3	4	5	6	7	8	9

Appendix P - Self-Affirmation Writing Condition and Sources of Validation Scale

Self-Affirmation Condition – Day 1

Before you begin this exercise, please do your best to be sure you will likely have the next fifteen minutes to yourself. If possible, complete this exercise when you have help or outside care for your child, or when your child is asleep. It is best if you are able to complete this writing session from start to finish uninterrupted. On the next page you will fill out a very short questionnaire asking you to rank a list of values. Following this, you will write for fifteen minutes. It may help to use some sort of timer such as <http://www.online-stopwatch.com/> so that you do not need to be concerned about the time as you write.

Below is a list of characteristics and values, some of which may be important to you, some of which may be unimportant. Please rank these values and qualities in order of their importance to you, from 1 to 13 (1 = most important item, 13 = least important item). Use each number only once.

- ||| Artistic skills/aesthetic appreciation
- ||| Sense of humor
- ||| Relations with friends/family
- ||| Spontaneity/living life in the moment
- ||| Social skills
- ||| Athletics
- ||| Musical ability/appreciation
- ||| Physical attractiveness
- ||| Creativity
- ||| Business/managerial skills
- ||| Romantic values
- ||| Religion

Appendix Q - Manipulation Check – Self-Affirmation
Condition

	I was not able to focus on the value or characteristic at all.	Less than half of the time	About half of the time	More than half of the time	I focused on this value or characteristic the entire time
During the previous 15 minutes of writing, how much were you able to focus on the value you chose to write about?	1	3	5	7	9

Appendix R - Reminder Check-in Email

Subject (Reminder to Complete Writing Exercise)

Hello!

This email is just to remind you to complete your three writing exercises within ten days. Please contact sara dot ericson @ umd.edu with any questions or difficulties. If you've already completed your exercises please ignore this email!

Thank you again,
Sara Ericson and Mary Ann Hoffman

If you are now or ever in crisis, you can contact the National Suicide Prevention Hotline 24 hours a day, 7 days a week, by online chat at [http : //www.suicide preventionlifeline.org/](http://www.suicidpreventionlifeline.org/) or by phone at **1-800-273-8255(TALK)**.

Appendix S - Final Reminder Email

Subject: Final reminder for writing exercises

Hello!

This email is to remind you that you have three days left to complete three writing sessions. We know you are very busy and really appreciate your time.

Thank you again,
Sara Ericson and Mary Ann Hoffman

If you are now or ever in crisis, you can contact the National Suicide Prevention Hotline 24 hours a day, 7 days a week, by online chat at : [//www.suicidepreventionlifeline.org/](http://www.suicidepreventionlifeline.org/) or by phone at **1-800-273-8255(TALK)**.

Appendix T - Weekly Check-in Email – writing conditions

Subject: Weekly Check-in

Hello!

This email is to make sure you don't forget about us! You are almost done with the study. Approximately one month after you finished your last writing exercise you will be asked to fill out another online survey, after which you will be eligible for the drawing.

You of course may stop participating at any time, but will not be eligible for the drawing until you complete the final online survey, which takes between 10 and 15 minutes.

Thank you again,
Sara Ericson and Mary Ann Hoffman

If you are now or ever in crisis, you can contact the National Suicide Prevention Hotline 24 hours a day, 7 days a week, by online chat at : [//www.suicidepreventionlifeline.org/](http://www.suicidpreventionlifeline.org/) or by phone at **1-800-273-8255(TALK)**.

Appendix U - Weekly Check-in Email – waitlist

Subject: Weekly Check-in

Hello!

This email is to make sure you don't forget about us! Approximately six weeks after you filled out the initial survey you will be asked to fill out some follow-up measures. You of course may stop participating at any time, but will not be eligible for the drawing until you complete the final online survey, which takes between 10 and 15 minutes.

After the survey you will have the opportunity to participate in one of the writing interventions. You are not required to participate in the writing interventions and will be entered into the drawing either way.

Thank you again,
Sara Ericson and Mary Ann Hoffman

Appendix V - Email for Follow-up Survey – Writing Conditions

Subject: Time for Follow-up Survey

Hello!

It is time for the final survey. As soon as possible please follow the link below to fill out a survey that should take you between 5 and 10 minutes. We appreciate the effort you have put in so far. This survey is an especially important step of the study, and as soon as you complete this survey you will be entered into the drawing for one of five \$50 Amazon gift certificates, which will take place upon completion of the study.

You of course may stop participating at any time, but will not be eligible for the drawing until you complete the final online survey. The gift certificate will be sent to your email if your number is selected for the drawing.

Thank you again so much for your willingness to participate in this research.

(LINK TO FINAL SURVEY)

Best,
Sara Ericson and Mary Ann Hoffman

If you are now or ever in crisis, you can contact the National Suicide Prevention Hotline 24 hours a day, 7 days a week, by online chat at : [//www.suicidepreventionlifeline.org/](http://www.suicidepreventionlifeline.org/) or by phone at **1-800-273-8255(TALK)**.

Appendix W - Email for Follow-up Survey – Waitlist Condition

Subject: Time for Follow-up Survey

Hello!

It is time for the final survey. As soon as possible please follow the link below to fill out a survey that should take you between five and ten minutes. We appreciate the effort you have put in so far. This survey is an especially important step of the study, and as soon as you complete this survey you will be entered into the drawing for one of five \$50 Amazon gift certificates, which will take place within the next 60 days. You of course may stop participating at any time, but will not be eligible for the drawing until you complete the final online survey.

The gift certificate will be sent to your email if your number is selected for the drawing. After the survey you will have the opportunity to participate in one of the writing interventions. You are not required to participate in the writing interventions and will be entered into the drawing either way.

Thank you again so much for your willingness to participate in this research.

(LINK TO FINAL SURVEY)

Best,
Sara Ericson

If you are now or ever in crisis, you can contact the National Suicide Prevention Hotline 24 hours a day, 7 days a week, by online chat at : [//www.suicidepreventionlifeline.org/](http://www.suicidepreventionlifeline.org/) or by phone at **1-800-273-8255(TALK)**.

Appendix X - Survey of professional assistance you received

Please select any of the following mental or physical health treatments you received while participating in the study. Please check all that apply.

- Pediatric check-ups
- OB/GYN checkups
- Psychotherapy or counseling
- Medication (e.g. antidepressants)
- Medical appointments for other reasons
- Other
- If other, please describe _____

Appendix Y - Option to Participate for Waitlist Control

Hello!

Thank you again for your participation in our study on new motherhood. We recognize how busy new parents are and appreciate both your time and effort. You have now completed the required portions of the study, and will be entered into the drawing for one of five \$50 Amazon gift certificates. These

You now have the opportunity to participate in the writing sessions, which will involve three separate short surveys and writing exercises, each of which should take you a little over 15 minutes to complete, to be completed on three separate days.

If you do not wish to participate in the writing sessions, you may be finished with the study now and read details about the interventions including hypotheses and general information about the study. If you choose to take part in an intervention now, you will be presented with this information once you are finished with the writing sessions.

Thank you again,
Sara Ericson and Mary Ann Hoffman

I would like to participate in a writing intervention. Please take me to directions and links to the interventions.

I do not wish to participate in a writing intervention. Please take me to information about the study.

If you are now or ever in crisis, you can contact the National Suicide Prevention Hotline 24 hours a day, 7 days a week, by online chat at <http://www.suicidepreventionlifeline.org/> or by phone at 1-800-273-8255(TALK).

Appendix Z - Debriefing Form

General Aim and Purpose

Thank you for participating in this study. Brief writing interventions have been shown to help people understand difficult experiences. The purpose of this study was to look at the impact of two writing interventions that may change the ways in which women view and feel about their transition to motherhood, and compare these two writing interventions with a waitlist control condition.

Writing Interventions

Participants were randomly assigned to one of three writing interventions: a self-affirmation condition, a mindfulness condition, and a waitlist control condition. The self-affirmation condition asked participants to write about the ways in which their values and identity influenced their transition to motherhood. The mindfulness condition asked participants to write about and consider their thoughts and feelings surrounding the transition to motherhood in a mindful way. This involves acceptance of thoughts and feelings without judgment, and observance and description of the ways in which one is thinking and feeling.

Main Hypotheses

We think that those in both the self-affirmation condition and the mindfulness condition will have greater reductions in measures of psychological and physical distress a month after completing the interventions than the waitlist control condition. We also think that those who are lower in some aspects of mindfulness, specifically the ability to refrain from judging or responding to one's own thoughts and feelings, will benefit more from the self-affirmation condition than the mindfulness condition.

Deception

No deception was used in this study.

Opportunity to take the other condition

If you would like to take the condition you did not take, the links below will lead to the interventions

Mindfulness

Day 1

Day 2

Day 3

Self Affirmation

Day 1

Day 2

Day 3

Contact Information and Therapy Services

Thank you again for your participation in this study. If you are ever concerned about personal issues, the American Psychological Association's Psychologist Locator at locator.apa.org can help you find a trained and practicing psychologist in your area

If you are now or ever in crisis, you can contact the National Suicide Prevention Hotline 24 hours a day, 7 days a week, by online chat at : [//www.suicidepreventionlifeline.org/](http://www.suicidepreventionlifeline.org/) or by phone at **1-800-273-8255(TALK)**.

In addition, if you are interested in finding out more information about writing exercises, you can find more information at:
<http://homepage.psy.utexas.edu/homepage/faculty/pennebaker/pennebaker.html>

If you have any questions about this research, please feel free to contact Sara Ericson at [sara dot ericson @ umd.edu](mailto:sara_dot_ericson@umd.edu)

Appendix A1 - Directions and Links for Waitlist Control

You now have the opportunity to participate in the writing exercises. Remember that this is optional and you are already being entered into the drawing.

You have been randomly assigned to one of two types of writing exercises. Traditionally, these exercises are done completed at least one day apart. We understand that life as a parent can limit available time, and ask that you complete them at your convenience within the next ten days, making sure each one is completed at least one day apart.

Your writing will be kept in a locked office in a password-protected folder, and not linked to your contact information. Please note that no one on the research team will be reading your writing on a regular basis, and that your writing will not be stored in connection with your contact information. If for any reason you feel you need to contact the researchers, please do so at sara dot ericson @ umd.edu

Below are three links, each one to a writing intervention. We suggest you save a copy of this page, or copy the text below so that you will continue to have easy access to these links. To begin, click on the link titled “Day 1” below. When you are ready to complete the second exercise, please return to this email and click on “Day 2”, and for the third, “Day 3”. We suggest you save a copy of this page, or copy the text below so that you will continue to have easy access to these links.

Thank you again,
Sara Ericson and Mary Ann Hoffman

Day 1

Day 2

Day 3

If you are now or ever in crisis, you can contact the National Suicide Prevention Hotline 24 hours a day, 7 days a week, by online chat at <http://www.suicidepreventionlifeline.org/> or by phone at 1-800-273-8255(TALK).

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