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The Role of Personality and Self-Control within Perinatal Mental Health Difficulties

By

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ABSTRACT

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THE ROLE OF PERSONALITY AND SELF-CONTROL WITHIN PERINATAL MENTAL HEALTH DIFFICULTIES

Hannah F Tinton

This thesis submission is composed of two chapters. The first is a systematic review exploring the role of personality in the development of perinatal depression and anxiety. This review aimed to deepen the understanding of the personality traits associated with the development of perinatal anxiety and depression, and to explore whether certain patterns of personality traits were predictive of perinatal mental health difficulties. A total of 26 papers met the elibigilibty criteria and were subject to a quality assessment and review. Specific personality traits were identified as predictors of perinatal depression and anxiety, namely high scores on scales of neuroticism, perfectionism, and introversion. In addition to these vulnerability factors, protective personality factors were identified, these included higher scores on scales of openness to experience, extraversion, agreeableness, and conscientiousness. This body of research is in its infancy, further prospective research is required with more consistent methdological approaches.

The second chapter sought to explore the applicability of the self-control model, proposed by Lynch, Hempel and Clark (2015), within perinatal mental health difficulties. A cross-sectional design was implemented to explore whether an overcontrolled coping style was predictive of mental health difficulties. 253 women within the perinatal period were recruited through NHS and non-NHS sites. The prevalence of mental health difficulties within the study sample was 31%. The hypothesis that women with mental health difficulties would have higher scores of overcontrol was not supported. There were, significant differences between clinical and non-clinical participants on several subscales of self-control indicating that participants within the clinical group had higher scores of detachment and lower scores of inhibition. When entered into a logistic regression analysis, these findings were confirmed: the total score of self-control was not predictive of membership to the clinical group; however, higher scores of detachment and lower scores of inhibition were predictive of mental health difficulties. These findings remained significant when controlling for previously identified risk factors such as age, income, and perfectionism. Clinical implications and directions for future research are discussed.

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DECLARATION OF AUTHORSHIP

I, Hannah Tinton, declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

The Role of Personality and Self-Control within Perinatal Mental Health Difficulties.

I confirm that:

This work was done wholly or mainly while in candidature for a research degree at this University;

Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;

Where I have consulted the published work of others, this is always clearly attributed;

Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;

I have acknowledged all main sources of help;

Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;

None of this work has been published before submission.

Signed: .....

Date: .....

Acknowledgements

"Rigid plans work best if you're building a skyscrapper; with something as mysteriously human as giving birth, it's best, both literally and figuratively, to keep your knees bent."
Mark Sloan

Firstly, I would like to take this opportunity to thank my supervisors, Dr Roelie Hempel and Dr Hannah Wilson for their advice, expertise and continued support throughout this project.

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Definitions and Abbreviations

Antenatal	Period during pregnancy
APA	American Psychological Association
APS-R	Almost Perfect Scale -Revised
BDI	Beck Depression Inventory
BDI-V	Simplified Beck Depression Inventory
BFI	Big Five Inventory
BFPI	Big-Five Personality Inventory
BPS	British Psychological Society
CBT	Cognitive Behaviour Therapy
CIDI-SF	Composite International Diagnostic Interview Short Form
CINAHL	Cumulative Index of Nursing Allied Health Literature
DBT	Dialectical Behaviour Therapy
DEQ	Depressive Experiences Questionnaire
DIGS	Diagnostic Interview for Genetic Studies
DPQ	Dutch Personality Questionnaire
DSRS	Depression Self-Rating Scale
EPDS	Edinburgh Postnatal Depression Scale
EPI	Eysenck Personality Inventory
EPQ	Eysenck Personality Questionnaire
EPQ-A	Eysenck Personality Questionnaire-Adult Version
EPQ-RS	Eysenck Personality Questionnaire-Revised Short Scale
FMPS	Frost Multidimensional Perfectionism Scale
FMPS-MEC	Frost Multidimensional Perfectionism Scale - Maladaptive Evaluative Concerns
GAD-7	Generalised Anxiety Disorder-7
Gestational age	Progression during pregnancy
GHQ	General Health Questionnaire
GHQ-28	General Health Questionnaire-28
HADS-D	Hospital Anxiety and Depression Scale - Depression
HADS-A	Hospital Anxiety and Depression Scale - Anxiety
HF-MPS	Hewitt-Flett Multidimensional Perfectionism Scale
IPSM	Interpersonal Sensitivity Measure
LDAS	Leeds Scale Depression & Anxiety
MAS	Montgomery & Asberg Scale

MDQ	Mood Disorder Questionnaire
Multipara	More than one child
NEO-FFI	NEO-Five Factor Inventory
NEO-PI	NEO- Personality Inventory
NHS	National Health Service
NICE	National Institute of Health and Care Excellence
OC	Overcontrolled
OOP	Other-oriented Perfectionism
OPCRIT	Operational Criteria Checklist for Psychotic Illness
OUT'M	Over- and Under-control Trait Measure
PAI-BOR	Personality Assessment Inventory – Borderline features scale
PD	Puerperal Depression
PDSQ	Psychiatric Disorder Screening Questionnaire
PHQ-9	Patient Health Questionnaire-9
POMS	Profile of Mood States
Postnatal	Period following birth
PNA	Postnatal Anxiety
PND	Postnatal Depression
PPA	Postpartum Anxiety
PPD	Postpartum Depression
Primigravida	Women pregnant for the first time
Primipara	First time mother
Primiparous	First time mothers
PSE	Present State Examination
QATQS	Quality Assessment Tool for Quantitative Studies
RCOG	Royal College of Obstetricians and Gynaecologists
RDC	Research Diagnostic Criteria
RO-DBT	Radically-Open Dialectical Behaviour Therapy
SCAN	Schedules for Clinical Assessment in Neuropsychiatry
SCID	Structured Clinical Interview
SCID-IP	Structured Clinical Interview for DSM-IV: Depression Module
SCID-NP	Structured Clinical Interview for DSM-III-R
SCL-R-90	Symptom Checklist 90-Revised
SOP	Self-oriented Perfectionism

SPP	Socially Prescribed Perfectionism
SSP	Swedish universities Scale of Personality
STADI	State-Trait Anxiety Depression Inventory
STAI	State-Trait Anxiety Inventory
STAI-R	State-Trait Anxiety Inventory-Revised
TMAS	Taylor Manifest Anxiety Scale
WHO	World Health Organisation
UC	Undercontrolled
UK	United Kingdom

Chapter 1: Literature review

1.1 Introduction

1.1.1 Perinatal mental health

The perinatal period, defined in terms of mental health, spans from conception to one-year post birth. Perinatal mental health difficulties include all psychiatric difficulties experienced during this period, including disorders with their onset at this time and pre-existing mental health difficulties that relapse during pregnancy or the first postnatal year.

In 2016, 696,271 births were reported within the UK (Office of National Statistics, 2016). Approximately 10-20% of women experience perinatal mental health difficulties (Knops, 1993, O'Hara & Swain, 1996, Royal College of Obstetricians and Gynaecologists, RCOG, 2017), indicating that approximately 69,627-139,254 women experience perinatal mental health difficulties per cohort of births. A broad spectrum of mental health difficulties, of varying severity, are experienced by women during this time. These include; depression, anxiety, post-traumatic stress disorder, and puerperal psychosis (O'Hara & Wisner, 2014). Mental health difficulties are just as common during this period as within any other time of a woman's life, with evidence to suggest that women are more at risk during the perinatal period of experiencing an increased severity of symptoms, psychosocial and marital problems than non-childbearing women (O'Hara, Zekoski, Philipps, & Wright, 1990, Hogg, 2013). Recent reports exploring the role of psychiatric illnesses in maternal deaths have highlighted that suicide is the leading direct cause of maternal death within a year postnatally (Oates, 2003, Austin, Kidea & Sullivan, 2007, Knight et al., 2014), indicating the importance of identifying those most at risk and providing the most appropriate mental health care.

1.1.2 Perinatal depression and anxiety

The most common and investigated perinatal mental health difficulties are depression and anxiety (Tanday, 2014). The identification of perinatal anxiety and depressive disorders is typically completed using screening questionnaires or clinical interviews during routine appointments with a midwife or obstetrician.

Perinatal depression is characterised by the persistent presence of cognitive, behavioural, and affective symptoms such as; low mood, irritability, poor concentration, feelings of guilt, self-criticism, social withdrawal, and changes in appetite, lasting two weeks or more (American

Psychological Association, APA, 2013, World Health Organisation, WHO, 1992). The prevalence rates for major and minor depression within the perinatal population vary depending on the identification method; however, they are estimated to be between 18-20% (Gavin et al., 2005, Wisner et al., 2013, O'Hara & Wisner, 2014).

Perinatal anxiety disorders are wide-ranging and vary from mild worries to generalised anxiety, social anxiety, and panic disorders. The symptoms include; worry, apprehension or sense of dread, reduced clarity of thinking, trembling, shaking, palpitations, altered perceptions and dizziness or sweating. The symptoms can be acute and episodic or persistent. The prevalence of perinatal anxiety disorders is estimated to be between 6-13% (Matthey, Barnett, Howie & Kavanagh, 2003, Adewuya, Ola, Aloba, & Mapayi, 2006, Wenzel & Stuart, 2011).

The prevalence rates of perinatal depression and anxiety are comparative to that of women in the general population (17%, McManus, Bebbington, Jenkins, & Brugha, 2016). The presence of comorbidities within the perinatal population is reported to be high. Wisner et al. (2013) found that 66% of women experiencing perinatal depressive disorders were also experiencing comorbid anxiety disorders. A history of anxiety is predictive of depressive disorders within the perinatal period (Wenzel, Haugen, Jackson & Robinson, 2003, Wenzel, Haugen, Jackson, & Brendle, 2005).

1.1.3 Effect of perinatal depression and anxiety

Perinatal mental health difficulties are estimated to cost society £8.1 billion for each one-year cohort of births in the UK (Bauer, Parsonage, Knapp, Iemmi, & Adelaja, 2014), and are classified as a major public health issue due to the impact on the mother, the wider familial system, the child, and society.

Maternal mental health difficulties during pregnancy have been found to influence the development of the foetal central and parasympathetic nervous systems, thus impacting upon the foetal heart rate, foetal movement, birth weight, prematurity, and placental abnormalities (DiPietro, Costigan, Pressman, & Doussard-Roosevelt, 2000, DiPietro, Hilton, Hawkins, Costigan & Pressman, 2002, Groome, Swiber, Bentz, Holland & Atterbury, 1995, Field, Diego, & Hernandez-Reif, 2006). Long term impacts on the child include; maladaptive emotional responses to emotional cues, greater hostility and increased rates of anxiety disorder diagnoses (Kagan, 1997, Sloan et al., 2001, Porges, Doussard-Roosevelt, Portales & Greenspan, 1996), the development of behavioural, emotional and mental health difficulties, special educational needs and increased negative affect throughout infancy and adulthood (Field, Diego, & Hernandez-Reif, 2006, Talge, Neal & Glover, 2007, Kinsella & Monk, 2009, Hay, Pawlby, Waters, Perra & Sharp, 2010). The risk of a child

developing mental health difficulties increases from 6% to 12% for infants of mothers who experience maternal stress, anxiety, or depression during pregnancy (Talge, Neal & Glover, 2007).

Postnatal depression and anxiety have been found to lead to non-typical parenting behaviours and fewer positive interactions with the infant, which in turn impacts upon the infant's development (Paulson, Dauber, & Leiferman, 2006, Field, 2010). Mothers with mental health difficulties are less likely to be sensitively attuned to their infant (Murray, Fiori-Cowley, Hooper, & Cooper, 1996) and the infant is more likely to develop an insecure attachment style (Carter, Garrity-Rokous, Chazan-Cohen, Little & Briggs-Gowan, 2001, Manning & Gregoire, 2009). The impact of these difficulties extends to the entire family. Studies have shown elevated incidences of partner mental health difficulties, reduced social activities, conflict, financial difficulties, and relationship breakdowns due to maternal mental health difficulties (Boath, Price & Cox, 1998, Burke, 2003).

Due to the wide-ranging effect of perinatal mental health disorders it is important to identify the women most at risk as early as possible during the perinatal period to provide them with appropriate treatment. Evidence to date suggests that effective treatments reduce the impact of the illness on the mother, infant and wider system significantly (Hogg, 2013).

1.1.4 Perinatal mental health risk factors

Numerous review studies have explored the risk factors associated with perinatal mental health difficulties and have found a range of biological, obstetric, and socio-economic factors. These include; history of mental health difficulties, previous prenatal loss, recent life stressors, reduced partner or close support, marital discord, poor relationship with maternal mother, past or current abuse, poor social support, financial and professional difficulties, increased obstetric and postpartum complications, and infant temperament (O'Hara & Swain, 1996, Robertson, Grace, Wallington & Stewart, 2004, Austin & Priest, 2005, Cantwell & Smith, 2006, Lancaster et al., 2009, Fisher et al., 2012). More recently, studies have begun exploring the role of personality in the development of perinatal mental health difficulties (Boyce, Parker, Barnett, Cooney & Smith., 1991, Milgrom et al., 2008, & Jones et al., 2010).

1.1.5 Personality as a risk factor for perinatal depression and anxiety

An individual's personality is made up of a set of traits which can be predictive of how they will respond in differing environments. These traits have been found to be stable and enduring throughout life, and can differentiate one individual from another (Roberts, Wood & Caspi, 2008). Studies within the general population have identified a role for personality within the development of mental health difficulties across the lifespan (Bienvenu & Stein, 2003, Clark, 2005, Brandes & Bienvenu, 2006, Klein, Kotov & Bufferd, 2011, Noteboom, Beekman, Vogelzangs, & Penninx, 2016). These include; negative affectivity (neuroticism), extraversion, agreeableness, obsessive-compulsive personality traits, perfectionism, negative attributional style, and self-criticism (Clark, Watson & Mineka, 1994, Anderluh, Tchanturia, Rabe-Hesketh, & Treasure, 2003, Kotov, Gamez, Schmidt & Watson, 2010). It is thought that personality traits could be underlying transdiagnostic factors that are common amongst numerous mental health diagnoses, or contribute to the development of comorbidities (Cuijpers, van Straten, & Donker, 2005, Khan, Jacobson, Gardner, Prescott & Kendler, 2005).

Several personality vulnerabilities have been identified as risk factors in the development of perinatal depression and anxiety. These include; neuroticism, introversion, perfectionism, self-criticism, tendency to worry, low self-esteem, lack of assertiveness, timidity, and over-eagerness to please others (Scotland Intercollegiate Guidelines Network, 2012). These traits have been found in pre-and postnatal depression and anxiety to varying degrees. Research to date suggests that individuals scoring highly on neuroticism, introversion and perfectionism are those most at risk of developing perinatal depression and anxiety (Marks, Wieck, Checkley & Kumar, 1992, O'Hara & Swain, 1996, Dudley, Roy, Kelk & Bernard, 2001, Jones et al., 2010).

Neuroticism, introversion and perfectionism are symptoms common among 'internalising disorders'. Internalising disorders are a cluster of clinical presentations that focus upon the distress being manifested within the individual and are characterised by an increase in negative affectivity (Achenbach, 1966, Krueger, 1999). Typically, these include; depression, anxiety, and anorexia nervosa, and may result in increased loneliness and withdrawal (Krueger, Markon, Patrick, & Iacono, 2005). In contrast, externalising disorders can be classified as a group of presentations that are exhibited externally within the environment. These are characterised by emotional dysregulation and impulsivity. Typical presentations include; childhood conduct disorders, antisocial personality disorder, and borderline personality disorder (Krueger, Markon, Patrick, & Iacono, 2005). An increasing body of evidence confirms these two broad categories. Internalising and externalising disorders are found both within adolescent and adult populations (Achenbach, 1966, Achenbach & Edelbrock, 1984, Krueger, Caspi, Moffitt & Silva, 1998, Kendler, Prescott & Myers, 2003, Hopwood & Grilo, 2010).

1.1.6 Aims and scope of the literature review

The role of personality is an emerging research area within perinatal mental health. This review will seek to explore the established personality traits and the role they play in the development of perinatal depression and anxiety. This is particularly important for the early identification of difficulties as a women's personality may predispose or contribute to the maintenance of depression or anxiety during the perinatal period, to offer the most suitable support. As far as the author is aware, this body of literature has not previously been reviewed. Previous reviews have predominantly focused upon external risk factors for the development of perinatal depression and anxiety and briefly included an outline of the possible personality factors but these are yet to be explored in detail.

1.1.7 Review objective (s) / Review question (s):

This review aims to answer the following questions;

- Which personality traits are involved in the development of perinatal anxiety and depression?
- Do specific personality traits increase a woman's likelihood of developing perinatal depression and/ or anxiety?

1.2 Method

1.2.1 Search strategy

Four electronic search databases, Medline (through EBSCO), PsychInfo (through EBSCO), Cumulative Index of Nursing Allied Health Literature (CINAHL, through EBSCO) and Web of Science, were used to conduct a systematic search of the literature. The search took place on 24 November 2016, no time limitations were applied to the search to ensure a wide range of literature was captured as there has been no previous review within this area.

1.2.2 Search terms

Table 1 outlines the search terms utilised to identify relevant studies. These were chosen to be as sensitive as possible to capture all relevant literature. The first search term ensured the entire duration of the perinatal period was captured from conception to one-year post birth. The second

term explored depression and anxiety. The third term captured the broad concept of personality alongside the personality risk factors already identified within perinatal depression and anxiety literature.

These terms were entered separately in the online databases and then added together using the Boolean operator AND. To ensure that the studies were exploring the direct association between personality and depression or anxiety during the perinatal period, a list of exclusion terms were added through the Boolean operator NOT following the AND terms. All four search terms were combined to identify appropriate studies for the review.

Table 1. *Search terms entered into the four databases.*

	Perinatal population	Mental health	Personality	Excluding
Search terms	Perinatal Pre-natal Post-natal Post-partum pregn* antenatal *partum	Depression: depress* Anxiety: anxi*	neuroti* clinical perfection* perfect* 'self-critical perfectionism' introver* Personality personality traits personality types	Paternal Eating* Anorex* obsessive compulsive chronic fatigue chronic pain HIV parent* maternal

Note. * *indicates that the word has been truncated to include all possible variations following the symbol ensuring a highly sensitive search strategy.*

1.2.3 Eligibility criteria

The literature retrieved by the searches was scrutinised against pre-determined eligibility criteria (detailed in Table 2). All papers eligible for this review were written in English (or previously translated), and published within peer reviewed journal articles. Due to the emerging nature of this topic all study designs were included in this review with the exception of single case studies. Studies were included if they measured personality alongside depression and/or anxiety using validated measures. All participants included within the studies had to be; female, above 18, and currently pregnant or within one-year post birth. There were no exclusions based upon the sample type: both clinical and non-clinical populations were included. Studies with non-pregnant comparison groups were also included.

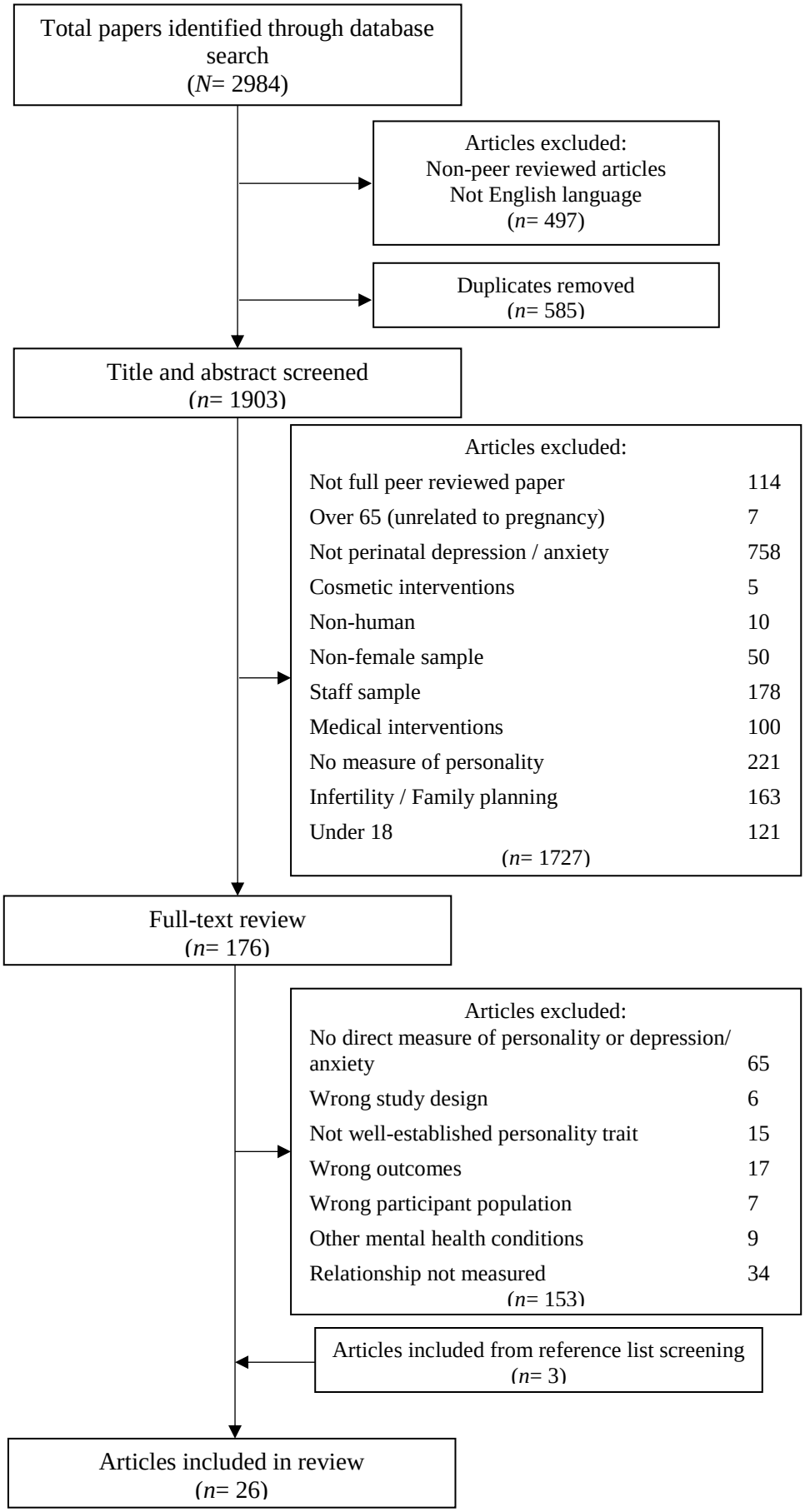
Table 2. *Eligibility criteria for papers included in the review.*

Eligible papers met the following criteria;	
Inclusion criteria:	Exclusion criteria:
- Written in English (or previously translated). - Published within a peer reviewed journal. - Participants are; female, 18 years or older and within the perinatal period. - Study measures depression or anxiety alongside the identified personality traits and explored an association between the measures. - Measures administered were validated measures. - Personality traits identified from previous literature within this population and from well-established personality measures were included.	- Translated article unavailable. - Book chapter or review papers. - Single case studies. - Studies including couples, participants under 18-years and fertility treatments. - No measures of depression, anxiety, or personality. - Exploring other mental health difficulties within the perinatal period. - Unvalidated measures or subjective units of distress.

1.2.4 Data selection

The results from the four-database searches yielded 2984 papers. The returned searches were filtered to include only peer reviewed and English language papers leading to 2488 papers. Of which, 585 were duplicates. The remaining 1902 titles and abstracts were screened, studies that were not relevant were excluded resulting in 176 studies for full-text review. On further scrutiny, 65 papers had no direct measure of personality, depression or anxiety (personality *n*=56, mood *n*=9), 34 did not directly measure the relationship between personality and depression or anxiety, 6 were excluded due to their study design (validating psychometric properties of new measures *n*= 3, *n*= 3 review papers), 15 measured personality characteristics or traits that did not meet the inclusion criteria (alexithymia *n*=1, sociotropic *n*=1, dependency and self-criticism *n*=8, narcissism *n*=1, type D *n*=1, social intimacy *n*=1, themes from Minnesota Multiphasic Personality Inventory *n*=2), a further 17 papers had other outcomes as their dependent variable (obstetric *n*=8, psychosocial support *n*=2, smoking *n*= 1, self-esteem *n*=1, exercise *n*=1, health care providers *n*=2, locus of control *n*=1, perinatal loss *n*=1), 7 included women who were outside the perinatal period or were surrogate mothers, the final 9 papers examined other mental health conditions (personality disorders *n*=5, puerperal psychosis *n*=4). Three additional articles were included following a manual search of the reference lists of the included papers, resulting in a sample of 26 studies in this review. The study selection and search results are outlined in Figure 1.

Figure 1. *Flowchart of study selection and search results.*



1.2.5 Quality Assessment

The final studies selected for review were assessed for their methodological quality using the Quality Assessment Tool for Quantitative Studies (QATQS, Effective Public Practice Health Project, 1998, outlined in Appendix A1). The QATQS has 6 subscales: A = selection bias, B = study design, C = confounding variables, D = blinding, E = data collection methods and F = withdrawals and drop-outs. These sub-scales are used to identify possible bias within each study. Using a detailed instruction manual, each study is rated on a Likert scale using information available within the paper and an overall rating is issued for each study. The QATQS was chosen for its breadth of appraisal and its ability to assess the quality of numerous quantitative study designs as required by this review. The QATQS has strong content and construct validity, adequate test-retest reliability (Thomas, Ciliska, Dobbins & Micucci, 2004), and fair inter-rater reliability for the individual scales and excellent for the overall grade (Armijo-Olivo, Stiles, Hagen, Biondo & Cummings, 2012).

1.3 Data Extraction

1.3.1 Study design

All 26 papers retrieved were quantitative (outlined in Table 3), with 3 different methodologies; case-control design (*n* = 4), prospective longitudinal design (*n*= 20), and cross-sectional design (*n*= 2). This review included studies that reported primary data sources (*n*= 15) and those which were part of larger longitudinal studies (*n*= 10), with the inclusion of one study utilising pre-collected norm data (Meares, Grimwade, Bickley, & Wood, 1972).

1.3.2 Study sample characteristics

All studies included in the review included women during the perinatal period. Sample sizes ranged from 46 – 1804, recruitment took place across a variety of settings, including; routine obstetric appointments (*n*= 23), antenatal groups (*n*= 2), and public advertisements (*n*= 1). All studies utilised non-probability sampling methods including; opportunistic (*n*= 19), consecutive (*n*= 5), convenience (*n*= 1), and systematic sampling (*n*= 1), 5 studies recruited only primiparous women. Numerous studies excluded women if they had previous mental health difficulties (*n*= 8), or were found to exceed the clinical cut off for mental health difficulties at baseline (*n*= 3). Women

were recruited at various time points during the perinatal period, with one study recruiting women pre-conception (Canals et al., 2002).

The mean age of the participants ranged from 22.3 to 33.7 years. Women recruited during the antenatal period had a mean gestational age between 8 - 36 weeks, and during the postnatal period infants were aged between 2 days – 8 months. Studies were primarily within European countries (*n*= 21), and the remainder of studies were conducted in Australia (*n*= 2), United States of America (*n*= 1), and China (*n*= 1). Within the 5 studies reporting the socio-economic status of participants, women were predominantly within the middle social class.

Table 3. *Data extraction.*

Authors	**Design and aims**	**Sample size and characteristics**	**Personality Measures**	**Psychometric Measures**	**Administration of measures**	**Key findings (effect size)**	**Quality assessment (QATSQ)**
Boyce et al., 1991	Prospective longitudinal cohort study. To establish whether personality traits, particularly high interpersonal sensitivity, and neuroticism, predict postnatal depression.	164 primiparous women in a stable relationship. Mean age: 27.2 years. Recruited from a public obstetric hospital during 2nd trimester. Opportunity sampling. Australia.	Neuroticism and extraversion measured using; EPI IPSM	Depressive symptoms measured using; BDI EPDS	4-time points: Antenatally: 2nd trimester, and postnatally: 1, 3, 6 months.	Women meeting the clinical cut off for depression on the BDI at 6 months postnatally had higher scores on IPSM (*d*= .59), introversion (*ns*, *d*= .44) and neuroticism (*ns*, *d*= .47). Women meeting the clinical cut off for depression on the EPDS at 6 months postnatally had higher scores on IPSM (*d*= .57), introversion (*ns*, *d*= .44) and neuroticism (*ns*, *d*= .20).	A - Moderate B - Moderate C - Weak D - Weak E - Strong F - Weak Global rating: Weak
Bunevicius et al., 2009	Prospective design. To assess the prevalence of antenatal depression across the 3 trimesters and to evaluate the relation of psychosocial risk factors.	230 women. Mean age: 29 years. Recruited from antenatal clinics. Opportunity consecutive sampling. Lithuania.	Neuroticism and extraversion measured using; BFPI	Depression classified using; CIDI-SF SCID-NP	3-time points: Antenatally at weeks 12-16, 22-26, 32-36.	Determinants of antenatal depression included unwanted pregnancy (T1 *d*=.99, T2 *d*= 1.5, T3 *d*= 1.09), neuroticism (T1 *d*=.74, T2 *d*= 1.22, T3 *d*= .81), low education (T1 *d*=.71), previous history of depression (T1 *d*=1.13) and psychosocial stressors (T3 *d*= .91).	A - Moderate B - Moderate C - Strong D - Moderate E - Strong F - Strong Global rating: Strong

Authors	Design and aims	Sample size and characteristics	Personality Measures	Psychometric Measures	Administration of measures	Key findings (effect size)	Quality assessment (QATSQ)
Canals et al., 2002	Prospective longitudinal design. To study the course of anxiety during the pre-pregnancy to postnatal stage, to analyse the influence of personality on anxiety and the relationship between anxiety and socio-demographic factors.	96 women. Mean age: 29 years. Recruited through posters and adverts pre-conception. Opportunity sampling. Spain.	Neuroticism, psychoticism, and extraversion measured using; EPQ-A	Anxiety measured using; STAI	5-time points: Pre-conception, antenatally at 10 and 30 weeks and postnatally at 3 days and one month.	Sample did not reach clinical cut off for anxiety. Neuroticism scores were significantly linked to anxiety scores. Unable to compute effect sizes from data provided.	A - Weak B - Moderate C - Strong D - Moderate E - Strong F - Moderate Global rating: Moderate
Dimistrovsky, 2002	Case-control design. To study perfectionism and depression during the transition into motherhood within the first pregnancy, and the interrelationships between marital satisfaction, depression, and perfectionism.	100 primiparous women and 50 non-pregnant women. Mean age: 27.9 years. Recruited from natural childbirth classes in the 3rd trimester. Opportunity sampling. Israel.	Perfectionism measured using; HF-MPS	Depressive symptoms measured using; DEQ	1-time point: For primiparous women this was antenatally.	Non-pregnant women had higher introspective depression scores (*d*= .35). Significant correlation between socially prescribed perfectionism and introjective depression (*d*= .87).	A - Weak B - Moderate C - Strong D - Moderate E – Moderate F - Strong Global rating: Moderate

Authors	**Design and aims**	**Sample size and characteristics**	**Personality Measures**	**Psychometric Measures**	**Administration of measures**	**Key findings (effect size)**	**Quality assessment (QATSQ)**
Gelabert et al., 2012	Case- control design. To explore the relationship between perfectionism dimensions and major postpartum depression.	Postnatal women. 115 recruited from a psychiatric unit. Mean age: 33.7 years. 122 recruited from an obstetric department. Mean age: 31.39 years. Opportunity sampling. Spain.	Neuroticism, psychoticism, and extraversion measured using; EPQ-RS Perfectionism measured using; FMPS	Depressive symptoms measured using; SCID-IP EPDS	1-time point: postnatally. Following remission of depression FMPS and EPQ-RS were administered.	Perfectionism was higher in the MDD group and was identified as an independent risk factor (*d*=.60), alongside high neuroticism (*d*=.78), psychiatric history (*d*=.70), and low expressing genotypes (*d*=.75).	A - Moderate B - Moderate C - Moderate D - Moderate E - Strong F - Moderate Global rating: Strong
Guszkowska et al., 2014	Cross-sectional design. To determine demographic, socio-economic and personality correlates of mental health of well-educated polish primiparas.	164 women. Mean age: 29.36 years. Recruited antenatally from birthing classes. Opportunity sampling. Poland.	Neuroticism, extraversion, openness, agreeableness, and conscientiousness measured using; NEO-FFI	Mental health symptomology measured using; GHQ-28 STAI	1-time point: antenatally.	Three groups of determinants of mental health in pregnancy: economic, personality and pregnancy related concerns. Neuroticism only predictive variable of severe depression (*d*= .95) and anxiety (*d*= .94).	A - Weak B - Weak C – N/A D - Weak E - Strong F – N/A Global rating: Weak

Authors	Design and aims	Sample size and characteristics	Personality Measures	Psychometric Measures	Administration of measures	Key findings (effect size)	Quality assessment (QATSQ)
Gutierrez-Zotes et al., 2015	Longitudinal cohort design. To analyse coping strategies as risk factors for postpartum depression (PPD) and examine the relationship of active and passive coping strategies with neuroticism, social support, perceived stress and symptoms of PPD.	1626 women. Mean age: 31.8 years Recruited postnatally from obstetric hospitals. Consecutive opportunity sampling. Spain.	Neuroticism, psychoticism, and extraversion measured using; EPQ-RS	Depressive symptoms and depression classified using; EPDS DIGS	3-time points: Postnatally 2-3 days, 8 and 32 weeks.	PPD associated with passive coping strategies and neuroticism. Unable to compute effect sizes from data provided.	A - Moderate B - Moderate C - Moderate D - Moderate E - Strong F - Moderate Global rating: Strong
Iliadis et al., 2015	Prospective longitudinal design. To assess the association between personality factors and postpartum depression (PPD).	1037 women. Mean age: not reported. Recruited antenatally between 16-18 weeks at their routine ultrasound. Opportunity sampling. Sweden.	Neuroticism, aggressiveness, and extraversion measured using; SSP	Depressive symptoms measured using; EPDS DSRS	4-time points: antenatally 17 and 32 weeks, postnatally 6 weeks and 6 months.	Non-depressed women reporting high levels of neuroticism in late pregnancy were at higher risk of developing PPD at 6 weeks (*d*= .88) and 6 months (*d*= 1.13). Somatic trait anxiety (*d*= .35) and psychic trait anxiety (*d*= .40) were risk factors for PPD at 6 weeks. When controlling for previously identified risk factors effect sizes remained consistent. Secondary data analysis.	A - Moderate B - Moderate C - Strong D- Moderate E - Strong F – Weak Global rating: Moderate

Authors	Design and aims	Sample size and characteristics	Personality Measures	Psychometric Measures	Administration of measures	Key findings (effect size)	Quality assessment (QATSQ)
Iliadis et al., 2017	Prospective design. To examine the association between a single nucleoside polymorphism in the hydroxysteroid (11-beta) dehydrogenase 1 gene and neuroticism, and the mediatory role of neuroticism in the association of the polymorphism and postpartum depression.	769 women. Median age: 31 years. Recruited antenatally during routine ultrasound at obstetric hospital. Opportunity sampling. Sweden.	Neuroticism, aggressiveness and sensation-seeking measured using; SSP	Depressive symptoms measured using; EPDS	3-time points: antenatally 17 and 32 weeks, postnatally 6 weeks.	An association between GG genotype and depressive symptoms. Neuroticism was a mediator between EPDS and the polymorphism. Secondary data analysis. Unable to compute effect sizes from data provided.	A - Moderate B - Moderate C - Moderate D - Moderate E - Strong F - Weak Global rating: Moderate
Imsiragic et al., 2014	Prospective design. To identify the most relevant predictors of postpartum depression.	372 women. Median age: 30 years. Recruited postnatally from obstetric department. Opportunity sampling. Croatia.	Neuroticism, extraversion, openness, agreeableness, and conscientiousness measured using; BFI	Depressive symptoms measured using; EPDS	2-time points: postnatally 3-5-days post birth, 6-9 weeks.	Predictors of depressive symptomology; T1: unsuccessful breastfeeding (*d*= .52) and neuroticism (*d*= .08). T2: fear for labour outcome (*d*= .49), baseline EPDS (*d*= .66). Odds decreased with high rates of openness.	A - Moderate B - Moderate C - Strong D - Moderate E - Strong F - Moderate Global rating: Strong

Authors	Design and aims	Sample size and characteristics	Personality Measures	Psychometric Measures	Administration of measures	Key findings (effect size)	Quality assessment (QATSQ)
Kennerley et al., 1989	Prospective design. To examine both the frequency and severity of the blues in relation to social, obstetric psychological and psychiatric factors.	112 women. Mean age: 28 years. Recruited antenatally between 12-14 weeks. Opportunity sampling. United Kingdom.	Neuroticism measured using; EPI	Anxiety and depression measured using; PSE Montgomery & Asberg Scale Leeds Scale Depression & Anxiety	4-time points: antenatally 14-16 weeks, 36-38 weeks, and postnatally within first 10 days and 12 weeks.	Maternity blues associated with poor social adjustment (*d*= .20), poor marital relationships (*d*= .21), history of PMS (*d*= .40), high neuroticism (*d*= .33), and depression (*d*= .30) or anxiety (*d*= .28) symptoms during pregnancy.	A - Moderate B - Moderate C - Strong D – Moderate E – Weak F - Strong Global rating: Moderate
Kumar et al., 1984	Prospective design. To record the incidence of depression following childbirth, and to observe the history of such depressions whilst searching prospectively for antecedents and sequelae.	119 first time mothers. Mean age: 28 years. Recruited antenatally between 12-14 weeks from routine obstetric appointments. United Kingdom.	Neuroticism, psychoticism, and extraversion measured using; EPQ	Depressive symptoms measured using; GHQ	9-time points: antenatally 12, 24, 36 weeks, postnatally 1, 6, 12, 26, 52 weeks and 4 years.	Increased depression during 1st trimester, a reduction in symptoms prior to week 24 in most cases. Postnatal depression onset within 4-6 weeks. Associations found between marital conflict and lack of support. High neuroticism and psychoticism were associated with antenatal depression, not postnatal depression. Unable to compute effect sizes from data provided.	A - Moderate B - Moderate C - Moderate D - Moderate E - Weak F - Strong Global rating: Moderate

Authors	Design and aims	Sample size and characteristics	Personality Measures	Psychometric Measures	Administration of measures	Key findings (effect size)	Quality assessment (QATSQ)
Lee et al., 2000	Prospective longitudinal design. To identify the psychosocial risk factors for postnatal depression.	220 Chinese women. Mean age: 29 years. Recruited postnatally (2nd day after delivery). Consecutive opportunity sampling. China.	Neuroticism was measured using; EPQ	Depressive symptoms and depression classified using; SCID BDI GHQ	2-time points: postnatally 2 days and 6 weeks.	Postnatal depression was found to be associated with depression during pregnancy (*d*= 1.43), elevated depression at delivery (*d*= .18), prolonged postnatal blues (*d*= .88), living in temporary housing (*d*= 1.55), financial difficulties (*d*= .67), and elevated neuroticism (*d*= .14).	A - Moderate B - Moderate C - Moderate D - Moderate E - Strong F - Moderate Global rating: Strong
Macedo et al., 2009	Cross- sectional design. To investigate the role of perfectionism in pregnancy to understand the positive and negative aspects of this trait.	421 pregnant women. Mean age: 29.8 years. Recruited antenatally from local health care centres. Opportunity sampling. Portugal.	Perfectionism measured using; HF- MPS (Socially prescribed perfectionism - SPP/ Self-oriented perfectionism scales - SOP)	Depressive symptoms and depression classified using; POMS BDI DIGS/ OPCRIT	1-time point: antenatally (mean gestational weeks: 32.6).	Higher levels of SPP factors were associated with increased psychological distress (*d*= 1.15).	A - Moderate B - Weak C - Moderate D - Moderate E - Strong F – N/A Global rating: Moderate

Authors	Design and aims	Sample size and characteristics	Personality Measures	Psychometric Measures	Administration of measures	Key findings (effect size)	Quality assessment (QATSQ)
Maia et al., 2012	Prospective design. To evaluate role of perfectionism as a risk factor in the development of postpartum depressive episodes.	386 women. Mean age: 30.08 years. Recruited antenatally within the 3rd trimester. Opportunity sampling. Portugal.	Perfectionism measured using; HF- MPS (Socially prescribed perfectionism - SPP/ Self-oriented perfectionism - SOP/ Other-oriented perfectionism scales - OOP)	Depressive symptoms and depression classified using; BDI DIGS/ OPCRIT	2-time points: antenatally and 3 months postnatally.	SOP and SPP were correlates of depressive symptomology in pregnancy (SOP *r*= .13, SPP- Others high standard (*r*= .20, SPP – conditional acceptance (*r*= .15). Others high standards was a significant predictor of postpartum depressive symptomology (*r*= .18) after controlling for trait anxiety, life stress social support and depression in pregnancy). Perfectionism scales did not predict postpartum depression.	A - Moderate B - Moderate C - Moderate D - Weak E - Strong F - Weak Global rating: Weak
Marin-Morales, 2014	Prospective design. To assess the influence of personality on puerperal depression whilst controlling for sociodemographic and clinical variables.	116 women. Mean age: 31.31 years. Recruited via telephone. Average gestational age on recruitment: 14.41 weeks. Opportunity sampling. Spain.	Neuroticism, extraversion, openness, agreeableness, and conscientiousness measured using; NEO-FFI	Depressive symptoms and depression classified using; EPDS SCL-R-90	2-time points: antenatally and 4 months postnatally.	Positive correlation between EPDS and neuroticism (*d*= .49), negative correlation between extraversion (*d*= --.30), conscientiousness (*d*= -.30) and EPDS. Neuroticism was the only trait with predictive capacity (*d*= 1.70).	A - Moderate B - Moderate C - Strong D - Moderate E - Strong F - Weak Global rating: Moderate

Authors	Design and aims	Sample size and characteristics	Personality Measures	Psychometric Measures	Administration of measures	Key findings (effect size)	Quality assessment (QATSQ)
Martin-Santos et al., 2012	Prospective design. To extend previous knowledge of the role of neuroticism, extraversion, and psychoticism as risk factors for postpartum depression.	1804 women. Mean age: 31.7 years. Recruited 2-3 days postnatally from obstetric departments. Opportunity sampling. Spain.	Neuroticism, psychoticism, and extraversion measured using; EPQ-RS	Depressive symptoms measured using; EPDS (& DIGS)	3-time points: postnatally 2-3 days, 8 weeks, and 32 weeks.	Women with depressive symptoms at 8 weeks and a major postpartum depressive episode throughout 32 weeks obtained lower scores on extraversion and higher scores on neuroticism and psychoticism scales. Neuroticism was a significant risk factor to EDPS scores >8 (*d*= .02).	A - Strong B - Moderate C - Strong D - Moderate E - Strong F - Moderate Global rating: Strong
Meares et al., 1972	Case- control design. To explore changes in levels of neuroticism and anxiety during pregnancy.	205 antenatal, 100 postnatal women. Mean age: 22.3 years. Pregnant women recruited at antenatal clinics. Postnatal data retrieved from Lewis (1971). Consecutive opportunity sampling. Australia.	Neuroticism and extraversion measured using; EPI	Anxiety symptoms measured using; Taylor Manifest Anxiety Scale	1-time point: either antenatally or postnatally.	Neuroticism higher in pregnant women than postpartum women (*d*= .42). Neuroticism higher in postpartum women than control group (*d*= .27). Anxiety higher in pregnant than control group (*d*= .36).	A - Moderate B - Moderate C - Moderate D - Moderate E - Strong F - Strong Global rating: Strong

Authors	Design and aims	Sample size and characteristics	Personality Measures	Psychometric Measures	Administration of measures	Key findings (effect size)	Quality assessment (QATSQ)
Oddo-Somerfield et al., 2016	Prospective design. To investigate the relationships between personality characteristics, peripartum anxiety and depression and bonding impairment.	266 women in the 3rd trimester. Mean age: 32.35 years. Recruited from an obstetric hospital. Opportunity sampling. Germany.	Perfectionism measured using; FMPS	Depressive symptoms and anxiety symptoms measured using; BDI-V EPDS STADI	2-time points: antenatally in the third trimester: and postnatally at 12 weeks.	PPD, PPA and BI indirectly influenced dysfunction perfectionism and avoidant personality style. Dysfunctional perfectionism influenced PPD, PPA and BI more than avoidant personality style. Unable to compute effect sizes from data provided.	A - Weak B - Moderate C – Moderate D - Moderate E - Strong F - Strong Global rating: Moderate
Peñacoba-Puente et al., 2016	Prospective design. To examine whether personality and cognitive factors could be related to postpartum depression.	116 women. Mean age: 31.5 years. Recruited during the 1st trimester from an obstetric hospital. Opportunity sampling. Spain.	Neuroticism, extraversion, openness, agreeableness, and conscientiousness measured using; NEO-FFI	Depressive symptoms and depression classified using; EPDS SCL-90-R	3-time points: antenatally at 12/13 and 30 weeks, postnatally at 4 months.	Personality and cognitive factors are associated with anxiety and PPD 4 months after childbirth. Neuroticism (*d*= .65) and extraversion (*d*= .58) were the most relevant risk factors.	A - Moderate B - Moderate C - Moderate D - Moderate E - Strong F - Weak Global rating: Moderate

Authors	Design and aims	Sample size and characteristics	Personality Measures	Psychometric Measures	Administration of measures	Key findings (effect size)	Quality assessment (QATSQ)
Podolska et al., 2010	Case control design. To analyse the relationship between personality traits and the risk of perinatal depression in pregnant and postpartum women.	229 women: 50 antenatal depression, 26 postpartum depression, 78 pregnant control and 75 postpartum control. Mean age: 28.2 Recruited from obstetric clinics. Opportunity sampling. Poland.	Neuroticism, extraversion, openness, agreeableness, and conscientiousness measured using; NEO FFI	Depressive symptoms measured using; EPDS	1-time point: either antenatally or postnatally.	Risk of depression in pregnancy; high neuroticism (*d*= .11), low extraversion (*d*= .05) and postpartum high neuroticism (*d*= .05), low extraversion (*d*= .005).	A - Moderate B - Weak C - Moderate D - Weak E - Strong F – N/A Global rating: Weak
Saisto et al., 2001	Prospective design. To examine the extent to which personality characteristics, depression, fear and anxiety about pregnancy and delivery predict disappointment with delivery and risk of puerperal depression (PD).	211 women. Mean age: 29.4 years. Recruited antenatally. Opportunity sampling. Finland.	Neuroticism, vulnerability, and anxiety using; NEO- PI	Depressive symptoms measured using; BDI	3-time points: antenatally pre- and post-30 weeks and postnatally at 2-3 months.	Depression predicted by antenatal depression. PND predicted by general anxiety (early pregnancy *d*= .33, late pregnancy *d*= .08), vulnerability (early pregnancy *d*= .10, late pregnancy *d*= .23), and neuroticism (early pregnancy *d*= .25, late pregnancy *d*= .10) after controlling for known risk factors.	A - Weak B - Moderate C - Moderate D - Moderate E - Strong F - Weak Global rating: Weak

Authors	Design and aims	Sample size and characteristics	Personality Measures	Psychometric Measures	Administration of measures	Key findings (effect size)	Quality assessment (QATSQ)
Sweeney & Fingerhut, 2013	Prospective design. To explore relationships between body satisfaction and postpartum depression symptoms, whilst controlling for maladaptive perfectionism.	46 women. Mean age: 27.17. Recruited during the 3rd trimester from obstetric departments. Opportunity sampling. United States of America.	Perfectionism measured using; FMPS (Concern about mistakes and Doubts about actions subscales) APS-R	Depressive symptoms measured using; EPDS	2-time points: antenatally at 28 weeks or beyond and postnatally at 2 months.	Body satisfaction predicted postpartum depression symptoms *(d*= .49). No main effect between maladaptive perfectionism and postpartum depression symptoms. Secondary data analysis.	A - Moderate B - Moderate C - Moderate D - Moderate E - Strong F – Weak Global rating: Moderate
van Bussel et al., 2009a	Prospective longitudinal design. Investigating the role of maternal orientations on the prevalence of depressive symptoms during perinatal period, whilst comparing it to other known intrapsychic variables.	403 women. Mean age: 30.15 years. 38.95% primigravida, recruited antenatally at 8-15 weeks during routine care. 202 completed all 5-time points. Opportunity sampling. Belgium.	Neuroticism, extraversion, openness, agreeableness, and conscientiousness measured using; NEO-FFI	Depressive symptoms measured using; EPDS HADS-D	5-time points: antenatally 8-15, 20-26, 30-36 weeks and postnatally 8-12, 20-25 weeks.	Maternal orientations: facilitator scale negatively associated with HADS-D. Regulator scale positive correlated to EPDS and HADS-D. Higher neuroticism lead to higher EPDS and HADS-D. Secondary data analysis. Unable to compute effect sizes from data provided.	A - Moderate B - Moderate C - Moderate D - Weak E - Strong F - Weak Global rating: Weak

Authors	Design and aims	Sample size and characteristics	Personality Measures	Psychometric Measures	Administration of measures	Key findings (effect size)	Quality assessment (QATSQ)
van Bussel et al., 2009b	Prospective longitudinal design. Investigating the role of maternal orientations on the prevalence of anxiety during perinatal period, whilst comparing it to other known intrapsychic variables.	403 women. Mean age: 30.15 years. 38.95% primigravida, Recruited antenatally, 8-15 weeks during routine care. 202 completed all time points. Opportunity sampling. Belgium.	Neuroticism, extraversion, openness, agreeableness, and conscientiousness measured using; NEO-FFI	Anxiety symptoms measured using; HADS-A	5 time points: antenatally 8-15, 20-26, 30-36 weeks and postnatally 8-12, 20-25 weeks.	Higher scores of neuroticism consistently predicted high rates of anxiety. The timing of anxiety was dependent on the parenting style. Unable to compute effect sizes from data provided	A - Moderate B - Moderate C - Moderate D - Weak E - Strong F - Weak Global rating: Weak
Verkerk et al., 2005	Prospective longitudinal design. To explore the relationship between personality (specifically neuroticism and introversion) in the prediction of postpartum depression.	277 women. 52.6% multipara. Mean age: 30.8 years. Recruited antenatally, 20-30 weeks. Systematic random sampling from completed	Neuroticism and Introversion measured using; DPQ	Depressive symptoms and depression classified using; RDC EPDS	4 time points: antenatally at 34 weeks and postnatally at 3,6,12 months.	Neuroticism and introversion were significantly associated with an increased risk of clinical depression at each measurement point postnatally. 3 months: N (*d*= .80), I (*d*= .52). 6 months: N (*d*= .13), I (*d*=. 52). 12 months: N (*d*= 1.17), I (*d*= .66).	A - Strong B - Moderate C - Strong D - Moderate E – Strong F- Strong Global rating: Strong

Authors	Design and aims	Sample size and characteristics	Personality Measures	Psychometric Measures	Administration of measures	Key findings (effect size)	Quality assessment (QATSQ)
		screening questionnaires. Netherlands.				High N, Low I: 3 months (*d*= .57), 6 months (*d*= .42), 12 months (*d*= .96). High N, Low I: 3 months (*d*= .96), 6 months (*d*= .93), 12 months (*d*= 1.33).	

Note. *Abbreviations included in Tables and text:*
Personality measures: APS-R = Almost Perfect Scale -Revised (Slaney et al., 2001), BFI = Big Five Inventory (Benet-Martinez & John, 1998), BFPI = Big-5 Personality Inventory (John & Srivastava, 1999), DPQ = Dutch Personality Questionnaire (Luteijn, Starren, & Dijk, 1985), EPI = Eysenck Personality Inventory (Eysenck & Eysenck, 1964), EPQ = Eysenck Personality Questionnaire (Eysenck & Eysenck, 1965), EPQ-A = Eysenck Personality Questionnaire- Adult version (Eysenck & Eysenck, 1992), EPQ-RS = Eysenck Personality Questionnaire- Revised Short Scale (Eysenck & Eysenck, 2001), FMPS = Frost Multidimensional Perfectionism Scale (Frost et al., 1990, German version Altstotter-Gleich & Bergemann, 2006), HF-MPS = Multidimensional Perfectionism Scale (Hewitt & Flett, 1989, 1991), IPSM = Interpersonal Sensitivity Measure (Boyce & Parker, 1989), NEO-FFI = NEO-Five Factor Inventory-Reduced (Costa & McCrae, 1992, 1999, Spanish version Seisdedos, 1999, Polish version Zawadzki et al., 1998), SSP = Swedish universities Scale of Personality (Schaling et al., 1994).

Psychometric measures: BDI = Beck Depression Inventory (Beck et al., 1961), BDI-II = Beck Depression Inventory (Beck et al., 1996), BDI-V = Simplified Beck Depression Inventory (Schmitt et al., 2006), CIDI-SF = Composite International Diagnostic Interview Short Form (Kessler et al., 2006), DEQ = Depressive Experiences Questionnaire (Blatt et al., 1976a, 1976b), DIGS = Diagnostic Interview for Genetic Studies (Azevedo et al., 1993), DIGS = Diagnostic Interview for Genetic Studies: DSM-IV (Roca et al., 2007), DSM-III-R Severity of Psychosocial Stressors Scale in Adults (APA, 1993), DSRS = Depression Self-Rating Scale (APA, 2001), EPDS = Edinburgh Postnatal Depression Scale (Cox et al., 1987, Spanish version Garcia-Esteve et al., 2003, German version Bergant et al., 1998, Polish version Bielawska-Batorowicz, 1995), GHQ = General Health Questionnaire (Goldberg, 1972), GHQ28 = General Health Questionnaire-28 (Goldberg & Williams, 2001), Leeds Scale Depression & Anxiety (Snaith et al., 1976), Montgomery & Asberg Scale (Montgomery & Asberg, 1979), OPCRIT = Operational Criteria Checklist for Psychotic Illness (McGuffin et al., 1991), POMS = Profile of Mood States (McNair et al., 1971), PSE-10 = Present State Examination 10th Revision (Wing et al., 1990), RDC = Research Diagnostic Criteria (Spitzer, Endicott, & Robins, 1978), SCAN = Schedules for Clinical Assessment in Neuropsychiatry (Wing et al., 1990), SCID-IP = Structured Clinical Interview for DSM-IV: Depression Module (First et al., 1997), SCID-NP = Structured Clinical Interview for DSM-III-R (Spitzer et al., 1990), SCL-90-R = Symptoms Checklist 90-Revised (Derogatis, 1977, Spanish versions: Gonzalez de Rivera et al., 1989, De Las Cuevas et al., 1991), STADI = State-Trait Anxiety Depression Inventory (Laux et al., 2013), STAI = State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970, 1988), STAI-R = State-Trait Anxiety Inventory-Revised (Spielberger et al., 1988), Taylor Manifest Anxiety Scale (Taylor, 1953).

QATQS 6 subscales: A = selection bias, B = study design, C = confounding variables, D = blinding, E = data collection methods and F = withdrawals and drop-outs.

1.3.3 Measures

Personality: Personality was measured using 13 validated measures covering 10 personality traits (outlined in Appendix A, Tables A2-A4); agreeableness (*n*= 7), aggressiveness (*n*= 2), conscientiousness (*n*= 7), extraversion (measured *n*= 15, reported =11), introversion (*n*= 1), neuroticism (*n*= 21), openness (*n*= 7), perfectionism (*n*= 6), psychoticism (*n*= 5, reported in *n*= 4), and sensation seeking (*n*= 2, reported in *n*= 1).

Numerous personality traits were explored using the administration of one measure within 17 studies. This included variants of the Eysenck Personality Inventory (1964), Eysenck Personality Questionnaire (1975), Big Five Personality Inventory (John & Srivastava, 1999), Big Five Inventory (Benet-Martinez & John, 1998) and the NEO-Five Factor Inventory (Costa & McCrae, 1992).

Six papers explored the role of perfectionism, using the Hewitt-Flett Multidimensional Perfectionism Scale (HFMPS, Hewitt & Flett, Hewitt & Flett, 1989, 1991) or the Frost Multidimensional Perfectionism Scale (FMPS, Frost et al., 1990). One paper used subscales from the FMPS (Frost et al., 1990) and the Almost Perfect Scale-Revised (APS-R, Slaney et al., 2001), a well-established combination focusing on maladaptive perfectionism (Blankstein & Dunkley, 2002). All studies measured perfectionism related to aspects of the self, using either the self-oriented perfectionism scale from the HFMPS (Hewitt & Flett, 1989, 1991) or the FMPS subscales concerns over mistakes and doubts about actions (Frost et al., 1990), and expectations from others, using the other-oriented perfectionism and socially prescribed perfectionism from the HFMPS (Hewitt & Flett, 1989, 1991) or the parental criticism subscale from the FMPS (Frost et al., 1990).

Two additional personality measures were administered: the Swedish Scale of Personality, a Swedish personality scale derived from the Karolinska Scales of Personality (Schalling et al., 1987) and a measure of interpersonal sensitivity (Interpersonal Sensitivity Measure, IPSM, Boyce & Parker, 1989) which has been associated with a depression-prone personality trait (Boyce & Parker, 1989).

The age of the personality measure varied with some of the personality measures having been developed over 40 years ago, (EPI, Eysenck & Eysenck, 1964, EPQ, Eysenck & Eysenck, 1975). Thirteen studies used translated versions of the scales which for the most part had been clearly stated and the translated version had been validated. There was some variability in the timing of the administration of the personality measures across the studies. Measurements for personality were typically administered at one-time point: preconception (*n*= 1), antenatally (*n*= 12) or postnatally (*n*= 4). Of these studies, the one-time personality assessment was either completed at baseline (*n*= 10), at the second assessment point in part of a longitudinal study with three or four-time points (*n*= 4), or were part of a cross sectional design (*n* =5). For the remaining studies, the

personality measures were either administered twice: at baseline within the antenatal period and at follow up within the postnatal period (*n*= 5), or at every time point (*n*= 4). The final study (Gelabert et al., 2012) measured personality following remission after a depressive episode to avoid the depressive state biasing the findings. Not all personality traits measured within the studies were reported.

Symptomology and clinical diagnoses: Nineteen validated measures of affective disorders was administered across the studies (overview in Appendix A, Tables A5-A7). Fourteen studies focused solely on depression, two on anxiety, and ten explored both affective disorders. As with the personality measures many of these measures were translated for the target population and the translated version was often validated. Measurements for mood were often taken at baseline either antenatally (*n*= 15) or postnatally (*n*= 5) and in the longitudinal studies repeated at intermittent stages during the antenatal period only (*n*= 1), during the postnatal period only (*n*= 12) or throughout the perinatal period (*n*= 8). Of the cross-sectional studies measures were either administered during the antenatal period (*n*= 3) or to women either in the antenatal or postnatal period (*n*= 2).

The most commonly used depression measure was the Edinburgh Postnatal Depression Scale (Cox et al., 1987, *n*= 14). Most measures administered were measures of symptomology or intensity of depressive symptoms. This is an effective measurement for identifying those most at risk, however, more established diagnostic tools were used to establish prevalence rates across 9 studies. There was some variation in the clinical cut off scores used in the studies (outlined in Appendix A, Table A5).

Anxiety measures within the studies both assessed symptomology and the state-trait nature of anxiety, allowing for the studies to establish an understanding of those who develop anxiety during the perinatal period and those who may be more dispositionally anxious and vulnerable to experiencing difficulties during the perinatal period. These were mainly measured with validated measures with the exception of one study (Maia et al., 2012), in which researchers assessed anxiety using one question. None of the measures utilised clinical cut offs (overview in Appendix A, Table A6).

A proportion of studies administered a measure that assessed depression and anxiety (*n*= 8). These scales assessed the severity of the symptoms experienced by the participants (outlined in Appendix A, Table A7).

1.4 Results

1.4.1 Quality assessment

The final studies selected for review were assessed for their methodological quality using the Quality Assessment Tool for Quantitative studies (QATQS, Effective Public Practice Health Project, 1998). Each study was rated on the 6 sub-scales using information available within the paper (further information in Appendix A1). Eight studies had strong methodological rigour, 11 were moderate and seven studies were weak in their methodological design. All studies within the review administered reliable and valid measures, and 13 had a follow up rate of over 69%. The 8 studies with strong methodological design included samples that were 'very likely' or 'somewhat likely' to be representative of the population, had low attrition rates, controlled for possible confounding variables, and implemented a case control or cohort study design. None of the studies were randomised control designs or incorporated an element of blinding. Of the studies scoring within the moderate to poor rating, 6 had a selection bias due to the unrepresentativeness of the population and 1 did not control for confounding variables.

1.4.2 Prevalence of depression and anxiety

Fifteen studies within this review reported the prevalence of mood disorders within their sample. The prevalence rates were reported at various times during the perinatal period and determined using a broad selection of measures. The findings have been grouped according to mood disorder and time point as none of the studies explored the prevalence across the whole-time perinatal period (details in Table 4). The prevalence rates antenatally were between 1.3% and 22% for those meeting the clinical cut off for depression in 7 studies, postnatally the percentage of patients meeting the clinical cut off for depression ranged between 4.9% and 24%. The prevalence of anxiety was only reported in one study, indicating that the prevalence of anxiety during the antenatal period was 16.9% and during the postnatal period was 9.7% (Oddo-Somerfield et al., 2016).

Table 4. *Reported prevalence rates.*

Study	Time point	Disorder	Measure used	Prevalence %
Boyce et al., 1991	3 months postnatally	Depression	EDPS	8.9
			BDI	13.6
	6 months postnatally		EPDS	6.4
			BDI	11.4
Bunevicius et al., 2009	12-16 weeks antenatally	Depression	CIDI / SCID	6.1
	22-26 weeks antenatally			3.5
	32-36 weeks antenatally			4.4
Gutierrez-Zotes et al., 2015	8 weeks postnatally	Depression	EDPS	15.5
			DIGS	6.2
	32 weeks postnatally		EPDS	12.7
			DIGS	6.8
Iliadis et al., 2015	6 weeks postnatally	Depression	EPDS	8.5
	6 months postnatally		EDPS	8.5
			DSRS	4.9
Iliadis et al., 2017	6 weeks postnatally	Depression	EPDS	8.6
Kennerley et al., 1989	14-16 weeks antenatally	Depression	PSE	3.5
	36-38 weeks antenatally			2.6
	3 months postnatally			12.6
Kumar et al., 1984	12 weeks antenatally	Depression	GHQ (confirmed by RDC)	16
	24 weeks antenatally			22
	36 weeks antenatally			9.9
	12 weeks postnatally			16.6
	26 weeks postnatally			11.6
	56 weeks postnatally			7.5
Lee et al., 2000	6 weeks postnatally	Depression	DSM Criteria	11.7
Macedo et al., 2009	32 weeks antenatally	Depression	DSM Criteria	1.4
			ICD Criteria	2.6
Maia et al., 2012	2 -3 trimester antenatally	Depression	DIGS – MDD	1.3
			DIGS – DD	2.3
	2 -3 trimester antenatally		DIGS – MDD	11.7
			DIGS - DD	16.6
Marin-Morales, 2014	4 months postnatally	Depression	EPDS	19.2
Martin-Santos et al., 2012	8 weeks postnatally	Depression	EPDS	11.9
	32 months postnatally			24
		MDD	DIGS	12.7
Oddo-Somerfield et al., 2016	Antenatally	Depression	BDI	10
	Postnatally		EPDS	10
	Antenatally	Anxiety	STADI	16.9
	Postnatally			9.7
Sweeney & Fingerhut, 2013	2 months postnatally	Depression	EPDS	17.4
				10.9
Verkerk et al., 2005	First year postnatally	Depression	RDC	18
	34 weeks antenatally			12.6
	3 months postnatally			10.8
	6 months postnatally			8.7
	12 months postnatally			7.2

1.4.3 Personality characteristics

Ten personality characteristics were measured within the studies included within this review (outlined in Table 3). The following sections outline the predictive value of each characteristic, followed by the patterns of personality traits identified within the studies.

Neuroticism

Twenty-one papers within this review explored the role of neuroticism in the development of perinatal depression and anxiety. Neuroticism was measured using nine different personality measures (outlined in Appendix A, Table A2), and the affective measures included both screening tools and diagnostic instruments (Appendix A, Tables A3-5). The results from these papers were consistent across measures for both neuroticism and affective disorders. Neuroticism was found to be positively correlated with both antenatal and postnatal depression and anxiety. Thirteen studies explored the role of neuroticism within the development of perinatal depression and anxiety using regression analyses to establish its predictive value. All studies reported that neuroticism was a significant determinant of perinatal depression and anxiety even when controlling for confounding variables such as; antenatal depression, age, poor social support, and stressful life events. Marin-Morales (2012) found that neuroticism explained 24.8% of the variance in the depression scores when measured using the Edinburgh Postnatal Depression Scale (Cox et al., 1987) and controlling for presence of depression in the first trimester, strongly supporting the idea that neuroticism is a vulnerability factor for experiencing mental health difficulties during the perinatal period.

The remaining studies explored the role of neuroticism using structural equation modelling, correlational and log linear analyses. These studies confirmed the positive correlation between neuroticism and perinatal depression. Peñacoba-Puente et al. (2016) identified that neuroticism was the strongest personality factor in the prediction of postnatal depression. Neuroticism was found to be associated with increased passive coping styles and life stressors (Gutierrez-Zotes et al., 2015). One study (Iliadis et al., 2017), explored the mediatory role between neuroticism and the 11-beta polymorphism in the development of postnatal depression. This study identified that the polymorphism and the EPDS were significantly correlated, but this correlation became weaker once neuroticism was entered into the model, indicating neuroticism's mediatory role in the development of postnatal depression. Of the 21 studies, only one reported that neuroticism failed to predict postnatal depression (Kumar et al., 1984).

Perfectionism

Six papers within this review explored the role of perfectionism in the development of perinatal depression and anxiety. All studies reported significant positive correlations between scales of perfectionism and perinatal depression and anxiety, but there was some variability in the

extent to which perfectionism was a predictive factor. Four studies explored the role of perfectionism using regression analyses. High perfectionism scores were associated with a threefold increase in risk for postnatal depression (*d*= .60, Gelabert et al., 2012), with a larger increase in risk being associated with the concern for mistakes scale. High scores on the socially prescribed perfectionism scale were associated with more severe and intense postnatal depressive symptomology (Macedo et al., 2009). Within two studies (Sweeney & Fingerhut, 2013, Maia et al., 2012) maladaptive perfectionism was not an individual predictor of postnatal depression, it did not contribute any unique variance to the model over and above previously established risk factors or body dissatisfaction, indicating it was not a risk factor for individuals scoring above the clinical cut off for postnatal depression.

Of the six papers exploring the role of perfectionism, one measured perfectionism antenatally to develop a clearer understanding of its predictive value in antenatal and/or postnatal depression and anxiety (Oddo-Somerfield et al., 2016). This study identified that the presence of perfectionism antenatally was a consistent factor in the development of antenatal depression and anxiety, but it was not consistently predictive of postnatal mental health difficulties. Mental health difficulties antenatally have been found to be a significant predictor of difficulties postnatally (Areias, Kumar, Barros & Figueiredo, 1996, Cantwell & Smith, 2006, Martini et al., 2015). These studies indicate that perfectionism may be an indirect mediator of postnatal mental health via its contribution to the development of antenatal difficulties.

Extraversion and introversion

Extraversion and introversion were often measured on the same scale in personality questionnaires, therefore the two traits findings are reported together. Within this review, one study reported the participants' levels of introversion and its role in the development of postnatal depression difficulties. Verkerk et al. (2005) found that introversion was significantly associated with an increased risk of postnatal depression at all 3-time points during the first-year post birth (mean *d* =.56).

Fourteen studies measured extraversion-introversion (reported in *n* =11), via the administration of differing personality measures (outlined in Appendix A, Table A2). Ten of these studies found extraversion has a negative correlation with depression across the perinatal period indicating its potential to be a protective factor. Significantly higher scores of extraversion were found in the non-depressed compared to depressed participants in 6 studies. A positive correlation was found between depression and introversion, but this was not strong enough for introversion to be an independent risk factor. The final study measured anxiety and found extraversion had no association with anxiety during pregnancy, however this sample did not reach the clinical threshold for anxiety (Canals et al., 2002).

Other personality factors

Agreeableness, conscientiousness, and openness to experience - Agreeableness, conscientiousness, and openness to experience were reported in six studies (measured in *n*= 7). Studies exploring openness to experiences, agreeableness and conscientiousness highlighted that these personality factors may be protective factors for women during pregnancy and postnatally (Imsiragic et al., 2014, Marin-Morales et al., 2014, Peñacoba-Puente et al., 2016, & Podolska et al., 2010), with findings indicating that high scores of these traits decrease the odds for women reaching clinically significant scores on measures of depression and anxiety perinatally. However, one study exploring the role of personality in the development of depressive symptomology found a positive correlation between openness to experience alongside negative correlations between conscientiousness and scores on the Edinburgh Postnatal Depression Scale and Hospital Anxiety and Depression Scale (van Bussel et al., 2009a). The role of these traits is unclear at present.

Aggressiveness and sensation seeking - Two studies measured aggressiveness and sensation seeking (Iliadis et al., 2015, 2017), but only one of these reported their findings (Iliadis et al., 2015). This study found that aggressiveness was associated with depression 6 months post birth, however, when entered into a logistic regression, neither aggressiveness nor sensation seeking were significant predictors of depression. The scale of sensation seeking closely mirrors that of openness to new experiences and therefore may serve as a protective factor.

Interpersonal sensitivity – Interpersonal sensitivity was measured in one study using the Interpersonal Sensitivity Measure (IPSM; Boyce and Parker, 1989, Boyce et al., 1991). Women within this study who were identified as experiencing current depression had higher scores on the IPSM, and scores on the IPSM were positively correlated with severity of depression symptoms. Multiple regression analyses found that high interpersonal sensitivity increased the predictive risk of women being classified as a ‘depression case’ at six months post-birth, however, this risk level vastly varied depending on which depression measure was used; using the EPDS (Cox et al., 1987) resulted in higher scores of relative risk (10.7) than the BDI (3.2, Beck et al., 1961).

Psychoticism – The personality trait psychoticism from the Eysenck personality scales (EPI, EPQ, EPQ-RS, Eysenck & Eysenck, 1964, 1965, 1975, 2001) was reported in four out of five studies. One study reported the role of psychoticism in the development of anxiety (Canals et al., 2002), this indicated that high scores of psychoticism were significantly associated to state anxiety three days following birth, and trait anxiety pre-conception, within the third trimester and one month postnatally, however none of the anxiety scores reached clinical threshold. Kumar and Robson (1984) reported high scores of psychoticism were associated with antenatal depression but did not predict postnatal depression. The final study (Martin-Santos et al., 2012) identified an associated between high scores of psychoticism and postnatal depression at 8 and 32 weeks postnatally, but this was not a predictive factor when entered into a logistic regression model.

Vulnerability and anxiety – Within one study, anxiety and vulnerability were identified as personality traits and measured using the NEO-FFI (Costa & McCrae, 1992). This study indicated that higher scores on these subscales were significant, although very modest, predictors of postnatal depression ($R^2 = 0.04$, $p<0.001$, Saisto et al., 2001).

1.4.4 Interaction of personality traits

Numerous studies explored the role of multiple personality traits in the development of perinatal depression and anxiety. As highlighted previously, neuroticism was a consistent predictor increasing the risk of perinatal depression and anxiety. Individuals with high scores on neuroticism often also had higher scores of introversion, psychoticism, and low extraversion (Kumar et al., 1984, Martin-Santos et al., 2012). Within a multiple logistic regression analysis, the presence of both high neuroticism and high introversion had a 4-6-fold increased risk for clinical depression postnatally compared to only having high scores on one of these traits, even when controlling for depression during pregnancy (Verkerk et al., 2005), although this finding was not always supported (van Bussel et al., 2009a). It is possible that the predictability of these traits for postnatal depression is mediated by trait anxiety (Peñacoba-Puente et al., 2016). The role of personality across the perinatal period was explored by Podolska et al. (2010), who reported that neuroticism consistently increased the risk of developing mental health difficulties across the perinatal period. Other risk factors included lower scores of openness, agreeableness and conscientiousness when compared to controls, however this did not continue during the postpartum period.

Within this group of studies, a protective personality profile was also suggested, which included higher scores on extraversion, agreeableness, conscientiousness, and openness (Imsiragic et al., 2014, Marin-Morales, 2014, Peñacoba-Puente et al., 2016, Podolska et al., 2010).

1.4.5 Summary of findings

The 26 studies included in this review reported that the prevalence of depression antenatally ranged from 1.3-22% and postnatally from 1.3-24%. The prevalence rates for anxiety were more difficult to establish with only one study reporting their findings, but this study reported an antenatal prevalence rate of 16.9% and a postnatal prevalence rate of 9.7%. The studies within this review have highlighted both risk factors and protective factors relating to depression and anxiety during the perinatal period. Neuroticism, perfectionism, and introversion have positive associations with scores on depression and anxiety scales across the perinatal period, indicating that women with high scores on these traits have an increased vulnerability to developing depression or anxiety either antenatally or postnatally. Psychoticism and aggressiveness may be risk factors for

the development of depression and anxiety within the perinatal period, however the research within this area is limited. Various studies explored the interaction of the different personality traits to provide a personality profile. This indicated that high neuroticism and introversion with low scores of extraversion, openness and conscientiousness increase an individual's risk to perinatal depression and anxiety. The review also identified that higher scores of extraversion, openness to experience, agreeableness and conscientiousness may serve as protective personality factors.

1.5 Discussion

1.5.1 Main findings

This review aimed to explore the role of personality in the development of perinatal depression and anxiety to determine whether certain personality traits increase a woman's likelihood of developing perinatal depression or anxiety. A broad literature search retrieved 26 quantitative papers which were subjected to a detailed quality assessment (QATQS, Effective Public Practice Health Project, 1998).

Role of personality: A pattern of personality traits was identified as increasing an individual's vulnerability to perinatal depression and anxiety, which included high scores on scales of neuroticism, perfectionism, and introversion. Neuroticism was found to have a consistent predictive role in the relationship between personality and perinatal difficulties across the different studies with medium to large effect sizes, which remained consistent when controlling for other potential risk factors. The role of neuroticism has also been confirmed in numerous studies exploring depression within non-perinatal populations (Boyce & Parker, 1989, Kendler et al., 2004, Muris et al., 2005), suggesting that individuals with high levels of neuroticism are more vulnerable to developing mental health difficulties at times of increased stress and may have poorer outcomes than those with lower scores of neuroticism. Introversion was often explored in conjunction with neuroticism, suggesting that individuals with high scores on both scales had an even further increased risk of developing perinatal depression and anxiety. Within the studies of perfectionism, high scores on individual subscales were identified as increased risk factors for mental health difficulties with large effect sizes, these included; the socially prescribed perfectionism and self-oriented perfectionism subscales from the Hewitt Multi-Dimensional Perfectionism Scales (Hewitt & Flett, 1989, 1991), and the concern over mistakes and doubts about actions subscales of Frost Multi-dimensional Perfectionism Scales (Frost et al., 1990). Indicating that during the perinatal period mental health difficulties are associated with one's own high standards, perceived high standards from others and increased concerns about one's own actions and making mistakes. Perfectionism was often measured alongside other known risk factors such as; body dissatisfaction,

marital satisfaction, dependency, and self-criticism. This study highlighted a paucity of evidence solely focusing on the relationship between perfectionism and perinatal depression and anxiety.

Protective personality factors were identified within the review, notably higher scores on scales of openness to experience, extraversion, agreeableness, and conscientiousness. Women scoring highly on these scales were less likely to develop perinatal depression and anxiety. Previous research has also indicated that these personality factors impact upon maternal behaviours, such as; childbirth (Johnston & Brown, 2013), breastfeeding (Brown, 2014), parenting style and type (van Bussel, 2009a, 2009b), and limiting a women's help seeking behaviours. It is possible that women with higher scores of openness to experience may have more flexible expectations surrounding pregnancy and the postpartum period. These protective personality traits were not consistently reported despite being measured in numerous studies. It would be helpful to further explore these factors within perinatal mental health to establish whether excessively high or low scores of these traits are protective or predictive of mental health difficulties.

This review explored the impact of personality within depression and anxiety, disorders typically conceptualised as internalising disorders. As previously outlined, internalising disorders are a cluster of clinical presentations that focus upon the distress being manifested within the individual and are characterised by an increase in negative affectivity (Krueger, 1999). The findings within this review are concordant with the current understanding of internalising disorders, indicating that the traits closely associated with internalising disorders, such as; neuroticism and introversion are predictive of mental health difficulties during the perinatal period. In addition, this review has identified protective personality traits. The protective traits appear to be those associated with externalising disorders, indicating that individuals with higher scores on externalising traits are less likely to develop perinatal depression and anxiety.

1.5.2 Critical review of the literature

The findings from this review appear to be consistent with previous broader reviews exploring a range of risk factors for perinatal depression and anxiety (O'Hara & Swain, 1996, Roberston, 2004, Milgrom et al., 2007, O'Hara et al., 2014). The majority of the studies included in the review scored moderate or strong for their methodological rigour according to the QATQS. However, some caution should be applied when considering the implications due to methodological flaws across the studies.

Study design and participants: There were considerable differences in the sampling methods and identification of participants. Sample sizes ranged from 46-1804, making it difficult to draw comparisons between the studies. A large proportion of the studies employed opportunity sampling from obstetric clinics, and whilst this is an ideal location to capture the target population,

the samples may not be representative of the whole population. Previous research has identified that women with mental health difficulties, low socio-economic status and from minority groups do not frequently attend obstetric appointments (Brugha et al., 1998), therefore women most at-risk due to external factors may not have been captured within the sampling methods. Studies included in the review identified that women who completed the follow up measures often reported to be experiencing fewer symptoms of depression than those who had withdrawn from the study (Gutierrez-Zotes et al., 2015, Marin-Morales et al., 2014, van Bussel et al., 2009a, 2009b). It was common amongst the studies included to exclude women if they were not first-time mothers (Boyce et al., 1991, Dimistrovsky, 2002, Guszkowska et al., 2014, & Kumar et al., 1984), or if they had ever experienced previous psychiatric difficulties (Canals et al., 2002, Gutierrez-Zotes et al., 2015, Imsiragic et al., 2014, Marin-Morales, 2014, Oddo-Somerfield et al., 2016, Peñacoba-Puente et al., 2016, & van Bussel et al., 2009a, 2009b). For these reasons, the included studies may limit the generalisability of the findings. A strength of this review is that the research included has taken place across numerous nationalities suggesting that these personality vulnerabilities are consistent across countries and cultures. Additionally, most studies employed prospective longitudinal designs and had comparatively low attrition rates, with the most common reason for drop out being the presence of obstetric complications.

Measures: This review has drawn together the evidence to date exploring the role of personality in the development of perinatal depression and anxiety. In doing this, the retrieved studies have either focused on a specific time point or explored the risk factors throughout a sub-section of the perinatal period. All papers within the review measured depression, anxiety and personality using reliable and valid measures. However, it was difficult to establish the true prevalence rates of depression and anxiety, and the influence of personality on the development of these difficulties due to the difference in administration of measures throughout the perinatal period. This included the use of numerous measures (13 for personality and 19 for depression and anxiety), and the application of different clinical cut off scores across studies, reducing the specificity of the measures. In the studies that used two scales to measure depression the odds ratios for the risk factors were scale dependent (Boyce et al., 1991, Iliadis et al., 2015, Lee et al., 2000). Within the literature there appears to be some disagreement across the studies regarding whether the personality measures administered are state-dependent, making it difficult to identify whether the findings were a true reflection of the personality risk factors. All studies employed self-report measures, with few confirming the findings using diagnostic interviews. The use of self-report measures is difficult in this population due to the potential influence of demand characteristics, social desirability, and the possibility that women do not report their true answers due to fear, as there continues to be a large amount of stigma still associated with perinatal mental health difficulties (Edwards & Timmons, 2005, Griffiths, 2015).

1.5.3 Limitations of literature review

With regards to the methodological quality, this review is likely to have a considerable amount of publication bias due to the inclusion of only published peer reviewed articles easily available in English. Therefore, any future review should include other languages and publication types. This may have limited the findings as there was a paucity of research solely completed in English speaking countries. The articles have all been assessed for their methodological rigour using a structured assessment tool but this was only completed by one reviewer, therefore this was not assessed for inter-rater reliability.

26 studies were retrieved exploring 10 different personality traits. There appears to be a bias of personality measured within this population. Papers exploring neuroticism are overly represented within this population. More recent evidence has begun to explore the role of cognitive factors and interpersonal skills, and it is recommended that future research and reviews explore cognitive biases and less well-established personality constructs or less well-established personality measures, such as self-criticism, to develop a broader understanding of the numerous factors that influence the development of perinatal mental health difficulties.

1.5.4 Implications

This review explored the role of personality in the development of perinatal depression and anxiety. Research focusing on personality in this area is still in its infancy and would benefit from further development, but this review was able to identify some key vulnerabilities and protective factors for women in the perinatal period.

The primary implication from this review is a focus upon early identification of women who are most at risk of developing difficulties and providing suitable interventions tailored to the individual's needs. Perinatal mental health difficulties continue to be underdiagnosed due to the lack of awareness and increased stigma still associated with mental health during this time (RCOG, 2017), despite routine administration of screening tools for perinatal depression and anxiety routine antenatal and postnatal appointments (NICE, 2014, recommend the PHQ-9 and GAD-7), however screening for vulnerable personality type is uncommon. There is no clear measure that could be used for all the risk factors identified in this study. Therefore, the development of a suitable screening tool would be beneficial as this would help tailor the form of support the individual may require.

The secondary implication from this review is focused on the support provided to women during the perinatal period. The NICE guidelines (NICE, 2014) suggest psychoeducation or support for at risk mothers and expectant mothers. The findings from this review indicate that treatments would benefit from being targeted towards reducing the negative affectivity typically associated

with introversion and neuroticism, and reducing the impact of high trait perfectionism. These interventions would include modelling from healthcare professionals that flexibility is helpful and useful during this life transition, with a focus on developing adaptive coping skills such as learning from mistakes. This could be completed effectively within antenatal classes preparing women with coping strategies as well as equipping them with the knowledge they need, thus, developing emotional expressiveness to aid in the communication between mother and infant and the wider support network. Previous studies have found treatment increased mood but not parenting behaviour (Austin & Priest, 2005), perhaps more targeted treatments based on personality style would have broader outcomes. For individuals requiring more intensive therapeutic support, evidence based treatments for personality traits such as perfectionism have been developed reducing perfectionistic traits and negative affect (Egan, Wade, Shafran & Anthony, 2014), their efficacy is yet to be supported within perinatal populations. However, compassion-focused, mindfulness and acceptance based therapies have been found to be efficacious in perinatal populations reducing symptoms of depression, anxiety, and negative affect (Vieten, & Astin, 2008, Cree, 2010, Goodman et al., 2014, Dimidjian et al., 2016), it is possible that these address the underlying personality traits.

1.5.5 Conclusions and recommendations for practice and future research

This review has explored the role of personality as a risk factor in the development of perinatal depression and anxiety. It has highlighted specific personality traits that are predictive of developing these difficulties, namely high scores on scales of neuroticism, perfectionism, and introversion. In addition to these vulnerability factors, protective personality factors were found, these included higher scores on scales of openness to experience, extraversion, agreeableness, and conscientiousness. To advance upon the findings in this review, it would be of benefit to explore all identified personality traits within a prospective study of perinatal women to develop a clearer understanding of the personality traits that are predisposing and protective factors influencing the development of mental health difficulties during this transition period for women.

Chapter 2: Empirical Paper

Examining the applicability of the neurobiosocial model of overcontrolled disorders within a perinatal population.

2.1 Introduction

2.1.1 Perinatal mental health

The perinatal period, defined in terms of mental health, spans from conception throughout pregnancy to one-year post birth. Perinatal mental health difficulties relate to the development or reoccurrence of mental health difficulties during this time. Perinatal mental health is a major public health issue not only due to the impact on the mother but due to the long-term consequences for the child and family system. It is estimated that perinatal mental health problems cost society £8.1 billion for each one-year cohort of births in the United Kingdom (UK), £10,000 per birth, with a large proportion of the costs being due to the adverse impacts on the child (Bauer et al., 2014).

The transition into parenthood has been recognised as a time when mental health and relationship difficulties are likely to occur (British Psychological Society, BPS, 2016). Approximately 10-20% of women experience perinatal mental health difficulties (Knops, 1993, O'Hara & Swain, 1996, Royal College of Obstetricians and Gynaecologists, RCOG, 2017). These difficulties include; depression, anxiety, post-traumatic stress disorder, bipolar affective disorder, and puerperal psychosis. During this period, the effects are more severe with symptoms rapidly becoming more intense (Hogg, 2013). A review of maternal deaths reported suicide as second the leading cause of death within the first year postnatally following cardiovascular disease (Knight et al., 2014). In addition, children and adolescents of mothers who experienced perinatal mental health difficulties have an increased risk to mental health problems themselves or requiring a specialised educational needs statement (Hay et al., 2010). The impact on the mother and the child highlight the need for the early identification and management of mental health difficulties during the perinatal period for increased long-term outcomes.

A recent review of perinatal services in the UK highlighted that 3% of clinical commissioning groups have a perinatal mental health strategy with fewer than 15% meeting the full national guidance, indicating that specialist mental health support may not be accessible to most mothers and that the services available are variable dependent on the mother's locality (Bauer et al., 2014). It is further estimated that approximately half of all cases of perinatal mental health problems are undetected, due to; difficulties in identification, lack of knowledge regarding perinatal mental health problems, limited access to specialist services, lack of specialist training in universal services, and the possible unwillingness of new mothers to disclose information about their mental health needs due to fear of stigmatisation (NHS England, 2015, Hogg, 2013, Fonseca, Gorayeb &

Canavarro, 2015). In a recent guideline update, the National Institute of Health and Care Excellence (NICE, 2014) recommend an improvement in the identification and assessment of perinatal mental health difficulties, leading to the receipt of timely and appropriate treatment improving maternal and infant outcomes (Joint Commissioning Panel for Mental Health, 2012).

2.1.2 Perinatal mental health risk factors

The causes of perinatal mental health difficulties are complex and heterogeneous, with those most at risk experiencing an interaction between many risk factors. A considerable amount of literature has been published exploring the risk factors which may predispose an individual to develop a mental health problem during the perinatal period. These risk factors can be split across biological factors, obstetric factors, and socio-economic factors. These include; a history of mental health problems which may or may not have occurred during a previous pregnancy, previous prenatal loss (Blackmore et al., 2011), familial mental health difficulties, recent life stressors (typically within 1 year), low social support, poor relationship with own parents (particularly mother) or spouse, history of/ or current abuse, low socioeconomic status, single marital status, unwanted pregnancy, difficult infant temperament, and adolescent or advanced maternal age (Beck, 2001, Oates, 2003, Cantwell & Smith, 2006, Austin & Priest, 2005, Johnson et al., 2012, O'Hara & Wisner, 2014, Räisänen et al., 2014).

Recent attention has focused on the psychological factors which may be more prevalent in this population. This has highlighted that low self-esteem, negative cognitive attribution styles, dysfunctional beliefs, high levels of rumination and high interpersonal sensitivity are associated with increased levels of perinatal distress (Austin & Priest, 2005, Milgrom et al., 2008, Leigh & Milgrom, 2008, Jones et al., 2010). This body of evidence suggests that psychological resources are a significant factor in the development of perinatal mental health.

2.1.3 Personality risk factors for perinatal mental health

Studies within the general population have identified a role for personality within the development of mental health difficulties (Noteboom, Beekman, Voglezangs, & Pennix, 2016). Although this is still an emerging topic within the field of perinatal mental health, evidence to date, as outlined in Chapter 1, has highlighted patterns of personality traits that increase an individual's vulnerability to perinatal mental health difficulties, including higher scores on scales of neuroticism, perfectionism, and introversion (Marks, Wieck, Checkley & Kumar, 1992, Dudley, Roy, Kelk & Bernard, 2001, Verkerk, Denollet, van Heck, & van Son, 2005, Dimistrovsky, Levy-Shiff & Zanany, 2002). In addition to these vulnerability factors, protective personality factors have

also been identified, these included higher scores on scales of openness to experience, extraversion, agreeableness, and conscientiousness (Imsiragic et al., 2014, Marin-Morales, 2014, Peñacoba-Puente et al., 2016, Podolska et al., 2010). This research suggests certain personality patterns may predispose an individual to experience perinatal mental health difficulties. The traits associated with perinatal mental health difficulties are closely linked to negative affectivity and internalising disorders, whereas the protective factors are associated with externalising disorder traits. This indicates that an individual's personality traits may influence their coping style, which has been proposed to be closely linked to self-control (Lynch, Hempel & Clark, 2015).

2.1.4 Self-control

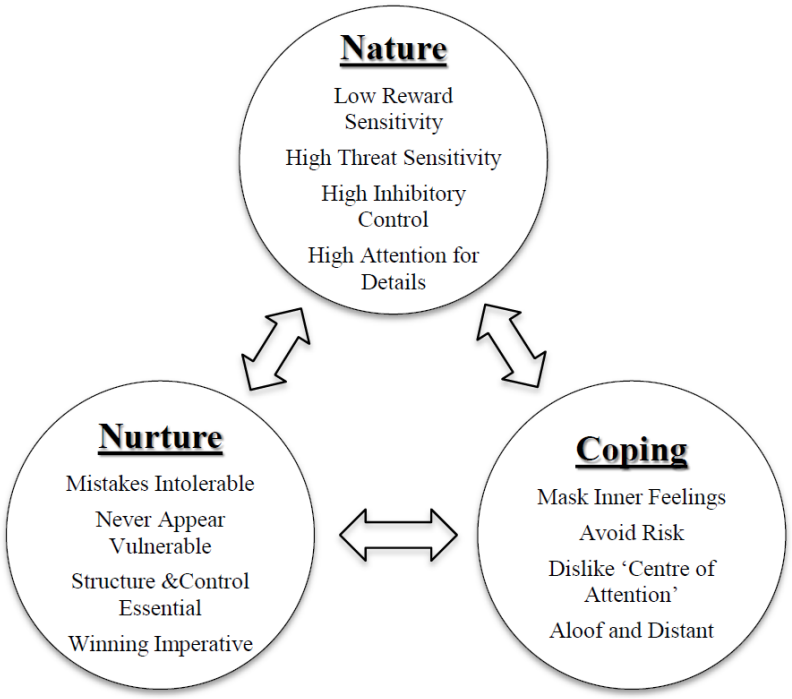
Human emotions arise when one is attending to a stimulus relevant to one's goals. Self-control is the ability to which one can inhibit their emotional urges to achieve their goals. Control theories have been present in psychological theory and research since the 19th century (see Mansell & Marken, 2015, for a full review). Despite there being different operational definitions, the commonality amongst the theories refers to an individual's ability to control impulses to pursue long term goals. The ability to not act on every impulse has allowed individuals to work together in groups for the pursuit of shared goals (Lynch, in press). Self-control is a desirable trait in most cultures, typically associated with success, and a lack of control is undesirable and seen as maladaptive (Block & Block, 2006). A wealth of literature suggests that self-control has a linear relationship with psychological functioning, wellbeing, education attainment and social environments (Tangney, Baumeister, & Boone, 2004, Bowlin & Baer, 2012, De Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012).

In contrast to the previous understanding of self-control, an emerging evidence base is beginning to suggest that there may be negative consequences at both extremes of self-control (Baumeister, Vohs, & Tice, 2007). Lynch, Hempel & Clark (2015) propose a quadratic relationship between self-control and mental well-being within their neurobiosocial theory of overcontrolled disorders, proposing that flexible optimal control is desired for individuals to function to the best of their abilities, while excessive or insufficient self-control can lead to mental health difficulties. More recently, self-control has been proposed as an overarching construct for classifying mental health disorders. Lynch, Hempel and Clark (2015) propose that mental health disorders can be broadly divided into overcontrolled or undercontrolled disorders.

2.1.5 Neurobiosocial theory of overcontrolled disorders

The neurobiosocial theory of overcontrolled disorders accounts for the development and maintenance of overcontrolled disorders through reciprocal transactions between bio-temperament and genetics (nature), family and environment (nurture) and self-control tendencies (coping), as depicted in Figure 2. An individual presenting with maladaptive overcontrol is likely to have bio-temperamental predispositions towards heightened threat sensitivity, low reward sensitivity, high attention to detail and increased inhibitory control, which interact with family and environmental experiences that reinforce high performance, the notion that mistakes are intolerable, structure and control are essential, winning is imperative, one must never appear vulnerable and that perfection is essential. These interactions lead to a maladaptive overcontrolled coping style which limits flexibility and adaptability to differing environments and situations and reduces opportunities to establish close social bonds (Lynch, Hempel & Clark, 2015).

Figure 2. *Neurobiosocial theory for overcontrolled disorders*



According to this model, difficulties relating to the extremes of self-control have been categorised as undercontrolled (UC) or overcontrolled (OC). Undercontrolled individuals tend to be low in constraint, impulsive, risk taking, dramatic, emotionally expressive, disorganised and tend not to consider others. These individuals are more likely to present with disorders such as antisocial and borderline personality disorders. In contrast, overcontrolled individuals tend to be risk adverse, inhibited, detail-focused, planned, and thrive in structured and organised environments. These individuals generally present with; obsessive compulsive personality disorder, chronic depression,

anorexia nervosa and autism spectrum disorders. The neurobiosocial theory of overcontrolled disorders proposes that flexible self-control is closely linked to mental wellbeing alongside receptivity and openness to new experiences and intimacy and connectedness with at least one individual.

2.1.6 Disorder type and self-control

The two categories of self-control within the neurobiosocial theory of overcontrol: undercontrolled (UC) and overcontrolled (OC), broadly parallel the well-established classifications of mental health difficulties proposed by Achenbach and colleagues (Achenbach, 1966, Achenbach & Edelbrock, 1984, Crijnen, Achenbach, & Verhulst, 1997): internalising and externalising disorders, however, there are some clear distinctions. Achenbach's (1966) classifications are based upon the presentation of symptoms which encompass internal thought processes and external behaviours. In contrast, the neurobiosocial model of overcontrolled disorders distinguishes between the internal and external processes and focuses upon the behavioural expression of the disorder, and the social signalling of the behaviours, seen as the individual's coping style (OC or UC).

As previously discussed in Chapter 1, internalising disorders are a broad cluster of clinical presentations characterised by an increase in negative affectivity (Achenbach, 1966, Krueger, 1999). The overcontrolled coping style is closely associated to internalising disorders due to low positive emotionality and high emotional inhibition. Externalising disorders are a group of clinical presentations that are exhibited externally within the environment. The undercontrolled coping style is typically associated with externalising disorders, this is mainly characterised by emotional dysregulation, impulsivity, and overt behavioural expressions of distress.

With regards to the disorders included within this study, considering the approach taken by the neurobiosocial theory of overcontrolled disorders, depression and anxiety are classified as overcontrolled disorders due to their coping style of risk aversion, hypervigilance, increased rumination, social comparisons, and social withdrawal. Whereas, borderline personality disorder and bipolar affective disorder are classified as undercontrolled disorders due to their behavioural manifestation of impulsivity, and erratic behaviour. Psychosis is also measured within this study, previous research is inconclusive with regards to whether psychosis-type disorders are internalising or externalising disorders (Kotov et al., 2011). However, due to the behavioural expressions of psychosis, and specifically puerperal psychosis, including; erratic behaviour, pressure of speech and suicidal actions, psychosis is viewed as undercontrolled and therefore classed within the externalising disorders category for the purpose of this study.

Whilst within the general adult psychopathology literature there has been an abundance of research on undercontrolled disorders (e.g. Biosocial theory of borderline personality disorder, Linehan, 1993, 2014), the idea that an individual's coping style, overcontrol or undercontrol, can

lead to mental health problems is relatively novel. Problems linked with overcontrol have received little attention or have been misunderstood, making recognition difficult. It is possible that this is due to the high value most societies place on capacities to delay gratification and inhibit overt or public displays of emotions and impulses. Table 5 outlines the four core deficits and eight trait domains of overcontrol hypothesized to contribute to the development and maintenance of overcontrolled disorders as defined by Lynch, Hempel & Clark (2015).

2.1.7 Personality and self-control

For this paper, the self-control trait domains have been linked with the well-established Big Five personality traits to outline the types of personality traits that may predispose an individual to developing an overcontrolled coping style and its associated mental health difficulties, thereby enabling the identification within the perinatal population.

As outlined in Table 5, the overcontrolled trait domains overlap with the Big Five personality trait model (Costa & McCrae, 1992a), but the two models are clearly different. For example, high neuroticism and high introversion overlap with several overcontrolled traits. Additional research is required to test the utility and overlap of overcontrol and Big Five traits in assessing, predicting, and treating mental health disorders. However, the evidence suggests that the personality traits associated with perinatal depression and anxiety support the notion that the neurobiosocial model of overcontrol is applicable to this population. In Chapter 1, 5 of the 10 personality traits identified within the review closely linked to the 8 traits of overcontrol, these included; conscientiousness, introversion, neuroticism, openness to experience, and perfectionism. Confirming the notion that high trait negative emotionality, emotion expression inhibition, compulsive striving and detail focused processing and low trait positive emotionality and affiliation needs are common amongst this population. These findings indicate that the neurobiosocial model of overcontrolled disorders is applicable to this population and would benefit from being empirically explored. However, due to this overlap it is important to also consider the other factors which may be influencing the presentation of mental health difficulties during the perinatal period. Previous research has identified that clinical perfectionism has been found to impact upon an individual's functioning across the following domains; emotion, social, physical, cognitive, and behavioural (Shafran et al., 2002). The key maintaining factors within this model are; self-criticism, avoidance, rigid standard setting, dichotomous evaluation of standards, and cognitive biases. All of which have clear overlap with the overcontrolled traits domains and clinical presentation of overcontrolled disorders. Therefore, this study has included a measure of perfectionism due to evidence suggesting that perfectionism is predictive of perinatal mental health difficulties (Gelabert et al., 2012, Macedo et al., 2009, Oddo-Somerfield et al., 2016) and to differentiate between the traits of perfectionism and

the traits of compulsive striving and hyper-perfectionism as expected within disorders of overcontrol.

Table 5. *Overcontrolled core deficits, trait domains and associated Big Five personality traits.*

Deficit	OC Trait domain	Clinical presentation	Big Five Personality trait
Receptivity and openness	Low trait openness to experience	Rigid, inflexible, and defensive to new environmental stimuli. Risk aversive, hypervigilant to threat, avoidance of novelty, automatic discounting of critical feedback resulting in limited opportunities to learn new behaviour or engage in social interaction.	Low scores on openness to experience scales
Flexible responding	High trait compulsive striving	High agency, high social dominance, persistence in non-rewarding activities to achieve a goal, able to delay gratification, excessive distress tolerance, compulsive working, and planning. Making compulsive attempts to fix problems. High performance focus, hyper-perfectionism, and rehearsal.	High conscientiousness High perfectionism: notably self-oriented perfectionism
	High trait detail focussed processing	Preference for detail processing over global processing. Hypervigilance for small discrepancies, preference for symmetry. Compulsive need for structure and order.	
	High trait moral certitude	Rule governed beliefs with strict adherence. Motivated by sense of duty or obligation. Leading to burn-out or emotional leakages.	
Emotional expression and awareness	High emotion expression inhibition	Concerned with emotional expression: incongruent social signalling, low rates of vulnerable self-disclosure, inhibited, and overly pro-social. Inhibited expression / disingenuous expressions, minimisation of distress.	High neuroticism Low extraversion High introversion
	Low trait positive emotionality	Exhibit diminished positive affect and reduced spontaneous expressions of excitement. Tendency to take themselves too seriously. Transient positive mood states related to accomplishment.	
Social connectedness and intimacy	Low trait affiliation needs	Aloof or distant in relationships, high social comparisons, envy or bitterness, low empathy, tendency to be overly cautious of others or validation skills in relationships. Diminished pleasure during social interactions. May lead to relationship break downs rather than repairing any ruptures.	High neuroticism High introversion
	High trait negative emotionality	Temperamental threat sensitivity, or negative affectivity. Experience aversive tension across safe environments. Risk-avoidant, repetitive checking for threats or mistakes. Increased anxiety. Rehearsal of social situations.	

Given the trait domains and the hypothesised characteristics of an individual with overcontrol, it is likely that the perinatal period carries an increased risk for mental health disorders for women who have an overcontrolled coping style. Understanding the role of overcontrol within a perinatal population is important due to the implications of this coping style on the individual's ability to interact with numerous healthcare professionals, increased social demands and meeting

the emotional and physical demands of an infant. These women will; prefer environments that are rule-governed, predictable, and familiar, hold themselves to hyper-perfectionistic standards, have extremely high expectations and find it very difficult to ask for or accept support from others. Recent studies suggest that less than 20% of perinatal women seek professional help for psychiatric difficulties (McIntosh, 1993, Fonseca, Gorayeb, & Canavarro, 2015). Whitton et al. (1996) found that 90% of women with depressive symptoms identified that they had a difficulty, but only 20% reported concerns to a healthcare professional. Help seeking behaviours and health beliefs are formed through an interaction between individual's personality type, level of self-control, coping style, past experiences, and upbringing (Rosenstock, Strecher, & Becker, 1988, O'Connor, Martin, Weeks, & Ong, 2014). The nature of an undercontrolled coping style and the emotional lability and expressiveness that would typically be associated with this disorder suggests that undercontrolled individuals are more likely to seek support. Whereas, the neurobiosocial theory of overcontrolled disorders suggests that an individual's bio-temperament and environment reinforces an overcontrolled coping style (Lynch, Hempel & Clark, 2015). It is likely that women with traits of overcontrol such as; low openness to new experience, compulsive striving, high emotion inhibition and high negative emotionality will find it very difficult to seek help due to their hypervigilance to threat, hyper-perfectionism, compulsive planning, rehearsal of situations, low rates of vulnerable disclosure, high self-criticism, and increased social comparisons. Indicating the importance of identifying women with an overcontrolled coping style.

The neurobiosocial model focuses on the importance of social signalling and being a part of the social group (Lynch, in press). It is possible that pregnancy and transition through the perinatal period leads to an increase in worries about being rejected from the social group due to pressures of meeting numerous health care professionals, continued assessment of parenting, developing new friendships and the expectations of being the 'perfect mother'. Emotional loneliness has been identified as a consequence of the overcontrolled coping style (Lynch, Hempel & Clark, 2015). For mothers, this emotional loneliness can be very difficult at a time when their role is changing and previously adaptive coping strategies are no longer sufficient. A lack of social support is a consistent predictor of postnatal depression (Lancaster et al., 2009, O'Hara et al., 2014), an individual with overcontrol has difficulties with social signalling and emotional loneliness is likely to have limited social support and feel detached from others, thus increasing the chances of experiencing postnatal depression.

Western societies and cultures promote independence, and an overcontrolled style of coping is likely to be reinforced throughout the perinatal period. For individuals with a flexible coping style this may not lead to mental health difficulties but for those at either end of the spectrum (overcontrolled or undercontrolled) this may lead to the development of perinatal mental health difficulties.

2.1.8 Rationale for current study

To date, there is a dearth of research on self-control, as defined by Lynch, Hempel and Clark (2015), within perinatal mental health. Exploring the role of self-control within the development of perinatal mental health will enable healthcare professionals to identify mothers who may develop difficulties during the perinatal period.

The most common mental health difficulties within the perinatal population are depression or anxiety, which can both be categorised as internalising disorders. Evidence to date, and the findings within Chapter 1, indicate that certain personality traits are associated with the development of perinatal mental health difficulties, these include; neuroticism, perfectionism, introversion, and self-criticism. All of which are trait characteristics generally found in internalised or overcontrolled disorders, such as chronic depression, social anxiety, and anorexia (Lynch, Hempel & Clark, 2015), therefore it can be hypothesised that overcontrol may be a possible underlying mechanism leading to the development of perinatal mental health difficulties for some women. The concepts of overcontrol and undercontrol are new within perinatal mental health; their relevance will first need to be established. This will help tailor screening tools, early identification, and interventions, which in turn will have a positive impact on the mother, the infant, and the mother-infant relationship.

2.1.9 Aims

This empirical paper aimed to explore the applicability of the self-control theory within the perinatal population to develop a clearer understanding of the coping styles influencing the development of perinatal mental health difficulties.

2.1.10 Research question:

Due to the lack of evidence regarding maladaptive coping styles within the perinatal population, the following research question was addressed:

1. What is the relationship between an individual's level of self-control and the presence of mental health difficulties during the perinatal period?

2.1.11 Hypotheses

1. The primary hypothesis proposed that women experiencing perinatal mental health problems have higher scores of overcontrol, as measured using the Overcontrol and Undercontrol Trait Measure (OUT'M) than 'healthy' controls, and that mental health difficulties were predicted by the individuals' coping style rather than perfectionism.
2. The secondary hypothesis explored whether women with an overcontrolled coping style experience internalising disorders such as depression and anxiety, and individuals with an undercontrolled coping style experience externalising disorders such as borderline personality disorder, bipolar affective disorder, and psychosis.

2.2 Method

2.2.1 Design

This study implemented a cross-sectional between groups design with two groups; 'healthy' controls and a clinical sample. Both groups were recruited using opportunity sampling and participants were allocated to each group depending on their scores on mental health questionnaires (as outlined in section 2.2.4). The independent variable was the level of self-control and the dependent variables were; allocation to the clinical group and type of mental health difficulties: either internalising or externalising.

To calculate the required sample size, an a priori power analysis was conducted using G*Power (Faul, Erdfelder, Lang & Buchner, 2007). This identified that 236 participants were required for the primary hypothesis, to detect a medium effect size (d=.5) with 95% power using an independent groups t-test with alpha at .05. The power analysis identified that of the 236 required participants, 79 were required in the clinical sample to allow for group comparison. Due to the lack of relevant previous research within this area, this power calculation was based upon obtaining a medium effect size using the conventions outlined by Cohen (1992).

2.2.2 Recruitment

Participants were recruited via three recruitment streams: (1) five NHS sites including specialist perinatal mental health services and mainstream NHS sites regularly used by the perinatal population; (2) online recruitment through social media and parenting forums; and (3) poster and leaflet advertisements across community centres and retail outlets serving the target population (full recruitment schedule in Appendix B1).

2.2.3 Inclusion/exclusion criteria

Women were eligible to take part in the study if they were over 18 years old, had a good command of the English language and were either pregnant or had given birth within the previous 12 months.

2.2.4 Materials

The research questions were assessed using a series of self-report questionnaires exploring the presence of a mental health difficulty and level of self-control (breakdown in Table 6). These questionnaires were made into a comprehensive online survey (Appendix B2) and were completed electronically. When considering the questionnaires for this study the reliability and validity of each measure were assessed, the length of time they would take and the relevance to the current literature both within existing perinatal mental health research and self-control. Where required, licence agreements and permissions were obtained. The survey had 144 items.

2.2.4.1 Demographic questionnaire

A brief demographic questionnaire ensured that the participants met the inclusion criteria and gathered detailed background information for each participant. This included questions regarding the participants' age, ethnic background, stage in the perinatal period, family constitution, employment status, mental health difficulties either current or historical and contact with mental health services.

2.2.4.2 Mental health questionnaires

The following measures were used to identify those participants who were currently experiencing mental health difficulties. The clinical cut off scores used within this study are outlined in Table 6.

Patient Health Questionnaire-9

The Patient Health Questionnaire-9 (PHQ-9, Spitzer, Kroenke & Williams, 2001) was used to screen for depressive symptomology. It is a self-administered measurement for depression severity, including nine items scored from 0 "not at all" to 3 "nearly every day". Participants' total score indicates the severity of the symptoms. This measure has been found to have high rates of sensitivity and specificity for major depressive disorder, it is a reliable and valid measure of depression severity (Spitzer, Kroenke & Williams, 2001). The PHQ-9 has been validated within the perinatal population (Spitzer, Kroenke, & Williams, 2000, Sidebottom, Harrison, Godecker & Kim, 2012).

Generalised Anxiety Disorder-7

The Generalised Anxiety Disorder-7 (GAD-7, Spitzer et al, 2006) is a seven-item measure identifying anxiety severity. All items are scored from 0 "not at all" to 3 "nearly every day". Participants' total score indicates the severity of the symptoms. Within general population studies the GAD-7 has been found to have good reliability, as well as strong criterion, construct, factorial and procedural validity (Spitzer, Kroenke, Williams & Lowe, 2006, Löwe et al., 2008). The GAD-7 has been validated for use within the perinatal period (Simpson, Glazer, Michalski, Steiner & Frey, 2014).

Mood Disorder Questionnaire

The Mood Disorder Questionnaire (MDQ, Hirschfield et al, 2000) is a 17-item screening instrument for bipolar spectrum disorder. Participants answer questions with "yes" or "no". To achieve a positive screen, participants must answer "yes" to 7 or more questions in the first section, answer "yes" to the second question and rate "moderate" to "severe" on question three. The MDQ has been found to accurately detect recent manic or depressed episodes associated with bipolar affective disorder (Boschloo et al., 2013), has good sensitivity for those with an understanding or insight into their own illness (Miller, Klugman, Berv, Rosenquist & Ghaemi, 2004) and is a useful screening tool within UK samples (Twiss, Jones & Anderson, 2008). The use of the MDQ within perinatal research has been found to assist with the identification of bipolar affective disorder (Clark et al., 2015).

Psychiatric Disorder Screening Questionnaire – Psychosis sub-scale

The Psychiatric Disorder Screening Questionnaire (PDSQ – Psychosis, Zimmerman & Mattia, 2001) is a self-report scale designed to identify common mental health conditions within the DSM-IV. It contains 13 subscales, one for each psychiatric disorder. Within this study, the six-item psychosis screening tool was administered. Each scale on the PDSQ has good internal consistency, test-retest reliability and discriminant, concurrent and convergent reliability (Zimmerman & Mattia, 2001). The PDSQ has previously been used within perinatal mental health research (Gollan, Hoxha, Getch, Sankin & Michon, 2013).

Personality Assessment Inventory – Borderline features scale

The Personality Assessment Inventory – Borderline features scale (PAI-BOR, Morey, 1991), is a 24-item borderline personality disorder (BPD) screening questionnaire taken from the Personality Assessment Inventory (PAI, Morey, 1991). Each of the 24 items are scored from 0 "False" to 3 "Very True". The PAI-BOR has been found to be reliable and valid (Morey, 1991) and to have incremental validity (Gardner & Qualter, 2009).

2.2.4.3 Personality style questionnaires

Two personality style questionnaires were used to establish patterns of personality within this population. The first was a self-control measure, the second was a perfectionism scale.

The Over- and Under-control Trait Measure

The Over- and Under-control Trait Measure (OUT'M, Seretis, Hempel, Smith-Lynch, & Lynch, personal communication), is a 20-item scale used to measure an individual's level of self-control. Participants were asked to rate the extent a word related to them from "not at all" to "extremely". This measure has three subscales; inhibition, need for structure, and detachment, all with good internal consistency. This measure is in its infancy but has been found to have good convergent, predictive, and discriminant validity (Seretis, Hempel, Smith-Lynch, & Lynch, personal communication).

Frost Multi-Dimensional Perfectionism Scale

The Frost Multi-Dimensional Perfectionism Scale (FMPS, Frost et al., 1990) is a 35-item scale used to measure perfectionism. Each item is rated from 1 "strongly disagree" to 5 "strongly agree". The FMPS has good internal consistency and is a reliable and valid measure of perfectionism (Frost et al., 1990). Evidence also suggests that the FMPS has good test-retest reliability and construct validity (Franco, Diaz, Torres, Tellez, & Hidalgo-Rasmussen, 2014). Subscales of the FMPS were used to develop a maladaptive perfectionism identified in previous literature as the Maladaptive Evaluative Concerns (MEC) scale, measuring the maladaptive elements of perfectionism by assessing critical self-evaluation and perceptions of parentally influenced perfectionism (Dibartolo et al., 2008, Levinson et al., 2015). This scale was created using the concern over mistakes, doubts about actions, parental criticism, and parental expectations subscales. The MEC scale has been identified as an indicator of poor psychological functioning, including self-concealment and depression (Dibartolo et al., 2008).

2.2.5 Procedure for the administration of the measures

The participants were recruited via the three recruitment streams through various forms of advertising. All participants were guided to complete the research through an online questionnaire portal called iSurvey (link and copy of survey in Appendix B2). On accessing the online survey all participants read the information sheet and consented to take part prior to completing the

questionnaires. Participants were only required to complete the questionnaire at one-time point. The mean amount of time taken to complete the survey was 16.70 minutes (range = 7-61 minutes).

Table 6. *Measures included in the questionnaire and cut off scores.*

Measure	Description	Cut-off score
PHQ-9 (Patient Health Questionnaire, Kroenke, Spitzer & Williams, 2001)	9-item measure identifying depression severity.	Study cut off: 11 indicating moderate depression.
GAD-7 (Generalised Anxiety Disorder -7, Spitzer et al., 2006)	7-item measure identifying anxiety severity.	Study cut off: 11 indicating moderate anxiety.
MDQ (Mood Disorder Questionnaire, Hirschfield et al., 2000)	17-item screening instrument for bipolar affective disorder.	A positive screen for bipolar disorder if participant answers: 1. "Yes" to seven or more of the 13 items in question number 1; AND 2. "Yes" to question number 2; AND 3. "Moderate" or "Serious" to question number 3.
PDSQ – Psychosis (Psychiatric Disorder Screening Questionnaire, Zimmerman & Mattia, 2001)	6-item psychosis screening tool.	A positive screen for psychosis if participant endorses 1 or more items on this scale.
PAI-BOR (Personality Assessment Inventory – Borderline Features Scale, Morey, 1991)	24-item borderline personality disorder (BPD) screening questionnaire.	Study cut off: for Significant BPD features was 38.
FMPS (Frost Multi-Dimensional Perfectionism Scale, Frost et al., 1990)	35-item scale used to measure perfectionism.	No clinical cut off as a part of this study.
OUT'M. (The Over- and Under-control Trait Measure, Seretis, Hempel, Smith-Lynch, & Lynch, personal communication).	20-item scale used to measure an individual's level of self-control.	No clinical cut off used. T-scores used to identify those with high OC or high UC.

2.2.6 Ethical considerations

Ethical approval was received from the University of Southampton School of Psychology Research Ethics committee, the University of Southampton Research and Governance Office, local NHS Research Ethics Committee, and Health Research Authority approval, giving access to 5 NHS sites across southern England (full ethical approval outlined in Appendix B3).

A participant information sheet explained the nature of the study and the right to withdraw at any time without this affecting the participants' anonymity or treatment (if they were accessing NHS services). No participant identifiable information was gathered at any stage. Consent was obtained through the online questionnaire portal prior to completing the questionnaires. On completion, participants were presented with a debrief statement which provided contact details of support networks and the researchers' contact details if the participant experienced any distress during completion. No deception was used.

2.2.7 Data Preparation

Analyses were conducted using Statistical Packages for Social Sciences V24 (SPSS, IBM, 2016). All data were prepared and checked for missing data. Minor amounts of data were found to be missing at random (<1%). 21 participants had missing data: three were excluded due to missing personality questionnaires, and the remaining 19 participants were missing up to 4 items on the various measures (1 item *n= 14*, 2 items *n= 1*, 3 items *n= 2*, 4 items missing *n= 1*). For these participants, the person mean imputation method was used to maintain sample size and reliability (Downey & King, 1998, Little & Rubin, 2014).

The questionnaires were scored according to the scoring manuals of each measure. Sum and/ or mean scores, where appropriate, were calculated. Additional variables were computed to ensure the hypotheses could be analysed (outline in Table 7).

Table 7. *Computed variables*

Variable	Outline
Mental health group	'Clinical': those participants who exceeded the threshold for any of the screening instruments. 'Non-clinical': those whose scores did not exceed any thresholds.
Type of disorder	Two variables (internalising disorder and externalising disorder) were created based on the participants' scores on the mental health questionnaires. Participants scoring above the clinical thresholds for Depression and/or Anxiety were scored as '1' for an 'internalising' disorder, while all others were scored '0', while patients scoring above threshold for Borderline Personality Disorder, Bipolar Disorder and/or Psychosis were scored '1' for externalising disorder while all others were scored '0'.
Maladaptive perfectionism scale	Subscales of the FMPS were used to develop a maladaptive perfectionism scale according to guidelines in DiBartolo et al. (2008), as outlined in section 2.2.4.

2.2.8 Analysis strategy

Preliminary statistics were calculated to explore whether the data (n = 253) conformed to the assumptions of normality and to assess variable distribution using histograms and Kolmogorov-Smirnov tests using total or t-scores for all variables. No significant outliers were identified, the data was normally distributed for the OUT'M, the remaining variables were not normally distributed. Due to the categorisations of the sample within the analyses identified this did not impact the analysis strategy therefore parametric tests were used for the main analyses. Supplementary analyses were completed using non-parametric tests. Internal consistency was computed for all variables using Cronbach's alpha (full results in Appendix B4, Table B2). All total scores met the criteria for adequate reliability (α >= .70), with the exception of the PDSQ (α = .66).

Variables were described independently for the women experiencing perinatal mental health problems (clinical group) and those without mental health difficulties (non-clinical group). Comparisons between groups were analysed using a series of independent t-tests. Three binary logistic regression models explored: (1) whether women with a predominantly over-controlled personality style experienced more mental health difficulties, (2) whether these were internalised disorders such as depression and anxiety, (3) whether individuals with under-controlled personality style experience externalising disorders such as borderline personality disorder.

2.3 Results

2.3.1 Participants

804 participants accessed the iSurvey website, 260 participants completed the questionnaires. Four of the 260 participants were excluded because they did not meet the inclusion criteria: infants older than 12 months (n=3), and male (n=1). A further three were excluded due to incomplete data sets. Therefore, 253 participants were included in the full analysis.

2.3.2 Clinical versus Non-Clinical Group Allocation

Tables 8, and 9 outline the descriptive statistics for the measures used to identify the participants who were currently experiencing mental health difficulties, and the number of

participants who met the clinical cut off for each measure. Within this study 79 participants met the clinical cut off for at least one mental health diagnosis (breakdown in Table 9). Using the PHQ-9, 46 participants exceeded the clinical cut off and were currently experiencing moderate-severe depression. The GAD-7 identified that 45 women were experiencing moderate-severe anxiety and therefore met the criteria for the clinical cut off. Bipolar Affective Disorder was screened for using the MDQ, this identified 10 participants meeting the clinical cut off for bipolar affective disorder. 22 participants within the sample met the threshold for psychosis according to the scores on the Psychiatric Disorder Screening Questionnaire. None of the participants within this study met the clinical threshold for borderline personality disorder using the PAI-BOR.

The disorders screened for within this study were categorised into internalising and externalising disorders: 47 participants met the clinical threshold for an internalising disorder and 32 for an externalising disorder, while 7 participants met the criteria for both internalising and externalising disorders.

Table 8. *Descriptive statistics of mental health measures.*

Variable	Non-Clinical (*N*= 174) Mean (*SD*)	Clinical *(N*= 79) Mean (*SD*)
PHQ-9	3.27 (2.56)	11.25 (6.55)
GAD-7	3.50 (2.50)	10.75 (5.84)
MDQ	1.34 (1.80)	3.16 (3.54)
PDSQ	0.00 (0.00)	0.38 (0.85)
PAI-BOR	47.92 (8.57)	54.59 (11.42)

Note. *Abbreviations included in Table 8 and 9: PHQ-9 = Patient Health Questionnaire-9, GAD-7 = Generalised Anxiety Disorder-7, MDQ = Mood Disorder Questionnaire, PDSQ = Psychiatric Disorder Screening Questionnaire, PAI-BOR = Personality Assessment Inventory- Borderline sub-scale.*

Table 9. *Frequency of participants meeting the clinical threshold for each mental health measure.*

Variable	*N*	Frequency %
PHQ-9	46	18.20
GAD-7	45	17.80
MDQ	10	4.00
PDSQ	22	8.70
PAI-BOR	0	0.00
Participants who met 1 clinical threshold	40	50.60
Participants who met 2 clinical thresholds	34	43.10
Participants who met 3 clinical thresholds	5	6.30
Type of disorder;		
Participants presenting with Internalising disorders	47	59.49
Participants presenting with Externalising disorders	32	40.50
Participants presenting with internalising and externalising disorders	7	8.90

2.3.3 Participant characteristics

Sample demographics are outlined in Tables 10 and 11 below according to group allocation.

All participants were female, 72.4% were aged between 25-35 years, 91.7% classified themselves as British and 97.2% spoke English as their first language. 42.7% were pregnant and 61.3% of women had given birth within the previous year. Of those who had given birth within the last 12 months, nine were pregnant again. Infant average age was 23.94 weeks (*SD*: 13.25). For 45.8% of mothers this was their first child, the mean number of previous children was 1.52 (*SD*: 0.83). 66.8% of women were married, all participants had achieved an educational award of GCSE's or higher, and 46.2% were in full time employment. Of those with employment 17% described themselves as the main or sole breadwinner for the household.

There were significant differences between the groups on age χ^2 (5) = 19.43, p <.01, educational level χ^2 (5) = 13.70, p <.01, household income χ^2 (6) = 16.15, p = 0.01, and previous mental health difficulties χ^2 (1) = 7.23, p <.01. Those participants meeting the clinical threshold were significantly younger, had a lower education status and household income, and higher rates of previous mental health difficulties. There were no significant differences between the clinical and non-clinical groups for the remaining demographic variables.

Of those who identified themselves as previously having a mental health difficulty (*n*= 122) 48 currently met the clinical cut off on one of the scales. Fifty-one participants reported current mental health difficulties, 25 met a clinical threshold. Of those identifying themselves as never having a mental health difficulty (*n*= 131) 31 currently met the clinical cut off on one of the scales, and of those who said they were not experiencing a mental health difficulty (*n*= 202) 54 met a clinical threshold. For those participants who were currently accessing support or who had previously accessed mental health services the most common interventions included; CBT, private or NHS counsellor and access to either a perinatal mental health team or community mental health team (breakdown in Table 11).

Table 10. *Demographic variables according to group allocation – categorical*

Variable		Non-clinical (*N*= 174) *n (*Frequency % non-clinical group)	Clinical (*N* = 79) *n (*Frequency % clinical group)
Age*			
	18-24	17 (9.77)	22 (27.85)
	25-35	137 (78.74)	46 (58.22)
	36-46	20 (11.49)	11 (13.92)
Ethnicity			
	British	157 (90.23)	75 (94.9)
	Other white background	9 (5.17)	3 (3.79)
	Asian background	6 (3.44)	1 (0.4)
	Caribbean	1 (0.4)	0 (0)
	Did not state	1 (0.4)	0 (0)
First language			
	English	169 (97.12)	77 (97.46)
	Other European language	3 (1.72)	2 (2.53)
	Other	3 (1.72)	0 (0)
Pregnant		71 (40.80)	37 (46.84)
Given birth within previous 12 months		111 (63.79)	44 (55.70)
Already a parent prior to this pregnancy / birth		92 (52.87)	45 (56.96)
Marital status			
	Single	8 (4.59)	10 (12.65)
	Co-habiting	42 (24.13)	22 (27.84)
	Married	122 (70.11)	47 (59.49)
	Widowed	1 (0.5)	0 (0)
	Not disclosed	1 (0.5)	0 (0)
Level of education*			
	GCSE	16 (9.19)	16 (20.25)
	A-Level	35 (24.30)	19 (24.05)
	Undergraduate degree	55 (31.60)	19 (24.05)
	Postgraduate qualification	29 (16.66)	11 (13.92)
	Master's degree	21 (12.06)	13 (16.45)
	Doctorate	18 (10.34)	1 (1.26)
Employment status			
	Employed full-time	146 (83.9)	59 (74.68)
	Unemployed	26 (14.9)	20 (25.31)
	Not disclosed	2 (1.14)	0 (0)
Breadwinner			
	Sole breadwinner	5 (2.87)	7 (8.86)
	Main breadwinner	20 (11.49)	11 (13.9)
	Partner is breadwinner	107 (61.49)	41 (51.89)
	Equal salaries	41 (23.56)	17 (21.52)
	Both unemployed	1 (0.5)	3 (3.79)
Household income*			
	Less than £25,000	25 (14.36)	21 (26.58)
	£25,000-49,000	52 (29.88)	32 (40.5)
	£50,000-99,000	80 (45.9)	20 (25.31)
	More than £100,000	17 (9.77)	6 (7.60)

Note *= $p<0.05$

Table 11. *Demographic variables according to group allocation – continuous*

Variable	Non-clinical (*N*= 174) *n (*Frequency % non-clinical group)	Clinical (*N* = 79) *n (*Frequency % clinical group)
No. participants who reported previous mental health difficulties*	**74 (42.52)**	**48 (60.75)**
Depression	51 (29.3)	39 (49.36)
Anxiety	49 (28.16)	28 (35.44)
Post-natal depression	18 (10.3)	20 (25.32)
Bipolar affective disorder	1 (0.5)	2 (2.5)
Psychosis	0 (0)	4 (5.06)
Personality disorder	2 (1.14)	5 (6.35)
Puerperal psychosis	0 (0)	0 (0)
Other	8 (4.5)	5 (6.35)
Previous access to mental health services	**48 (27.5)**	**34 (43.03)**
This included;		
Cognitive Behavioural Therapy	20 (11.5)	8 (10.12)
Private or NHS counsellor	15 (8.62)	7 (8.86)
Perinatal Mental Health Team	2 (1.14)	5 (6.32)
Community Mental Health Team	1 (0.5)	5 (6.32)
General Practitioner	5 (2.87)	5 (6.32)
Other therapy (ACT, DBT or Crisis support)	5 (2.87)	8 (10.12)
Anti-depressant medication	1 (0.5)	2 (2.53)
No. participants who reported current mental health difficulties	**26 (14.9)**	**25 (31.64)**
These included;		
Depression	7 (4.02)	11 (13.9)
Anxiety	19 (10.9)	20 (25.32)
Post-natal depression	11 (6.3)	10 (12.65)
Bipolar affective disorder	1 (0.5)	2 (2.5)
Psychosis	0 (0)	1 (1.26)
Puerperal psychosis	0 (0)	1 (1.26)
Personality disorder	0 (0)	3 (3.79)
Other	2 (1.14)	3 (3.79)
Currently accessing mental health services	**8 (4.6)**	**12 (15.2)**
These included;		
Cognitive Behavioural Therapy	2 (1.14)	5 (6.32)
Perinatal Mental Health Team	3 (1.72)	5 (6.32)
Community Mental Health Team	0 (0)	2 (2.5)
Private or NHS Counsellor	2 (1.14)	0 (0)
General Practitioner	3 (1.72)	1 (1.26)

Note *= $p<0.05$

2.3.4 Personality measures

Correlational analyses

Prior to the main analyses the variables were entered into a bivariate correlation. The measure of overcontrol was moderately correlated with the measure of perfectionism (FMPS). The OUT'M was negatively correlated with all externalising disorder measures, with no correlations found between the OUT'M and the internalising disorders measures (outlined in Table 12, full outline in Table B3, Appendix B5).

Table 12. *Correlational relationships between the main variables.*

Variable	PHQ-9	MDQ	PAI	PDSQ	OUTM	FMPS	FMPS - MEC
GAD-7	.77***	ns	.15*	ns	ns	ns	ns
PHQ-9	-	.15*	.15*	ns	ns	ns	ns
MDQ	-	-	.58***	.37***	-.14*	.31***	.36***
PAI	-	-	-	.36***	-.16*	.34***	.41**
PDSQ	-	-	-	-	-.15*	ns	.14*
OUTM	-	-	-	-	-	.17*	ns

Note *= $p<0.05$, ** = $p<0.01$ ***= $p<0.001$

Abbreviations included in Table 12: PHQ-9 = Patient Health Questionnaire-9, GAD-7 = Generalised Anxiety Disorder-7, MDQ = Mood Disorder Questionnaire, PDSQ = Psychiatric Disorder Screening Questionnaire, PAI-BOR = Personality Assessment Inventory- Borderline sub-scale. OUTM = Over and Undercontrol Trait Measure.

2.3.5 Hypothesis 1: Perinatal mental health and overcontrol

Table 13 outlines the descriptive statistics for the measures used to explore the different personality types within the sample. The Overcontrol, Undercontrol Trait Measure (OUT'M) was administered to explore the levels of self-control within the sample; the Frost Perfectionism Scale (FMPS) was administered to measure the perfectionistic traits of the sample. Both scales were broken down according to their subscales.

A series of independent t-tests were computed to explore whether women experiencing perinatal mental health problems had higher scores on the over-control and under-control measure and its subscales than the non-clinical group. These t-tests disconfirmed hypothesis one; the two groups did not significantly differ on their total OUT'M scores. Participants within the clinical population did not have higher scores of overcontrol (M = 49.00, SE = 1.23) than those participants within the non-clinical group (M = 50.45, SE = 0.72). The groups, did however, significantly differ on the OUT'M subscales of inhibition, t (101.80) = 4.30, p <.01, and detachment, t (124.54) = -3.38, p <.01, but not on the need for structure subscale, as reported in Table 10. Participants within the non-clinical group had significantly lower scores on the detachment subscale and significantly higher scores on the inhibition subscale than the clinical group.

The groups were also assessed for their level of perfectionism, as this is hypothesised to be a trait of overcontrol and was previously identified as a risk factor for perinatal mental health difficulties. There was no significant difference between the groups for perfectionism using the full scale FMPS. Further analyses were computed on the subscales of perfectionism, which identified that the groups significantly differed on the doubts about actions, U = 5470.50, p <.01, and maladaptive evaluative concerns, U = 5815.50, p <.05, with those meeting the clinical cut off for mental health difficulties having higher scores than the non-clinical group on both subscales of the FMPS, see Table 13.

Table 13. *Between group comparisons for overcontrol and perfectionism.*

Variable	Non-Clinical (*N*= 174) Mean (*SD*)	Clinical *(N*= 79) Mean (*SD*)	Test statistic	*p*-value	Effect size (*d*)
OUT'M (total)	89.67 (14.16)	87.52 (16.32)	*t* (251) = 1.06	.28	.14
OUT'M – Inhibition***	44.98 (4.99)	41.25 (13.22)	*t* (101.80) = 4.30	<.01	.58
OUT'M – Detachment***	11.19 (5.94)	14.41 (7.48)	*t* (124.54) = -3.38	<.01	-.05
OUT'M – Need for structure	26.86 (10.53)	26.00 (10.29)	*t* (154.13) = .617	.54	.08
FMPS (total)	72.58 (20.61)	79.08 (25.67)	*U* = 5921.5, *z* =-1.76	.07	.22
FMPS – Concern over mistakes	21.17 (8.19)	23.67 (10.26)	*U* = 6003.00, *z* =-1.61	.11	.20
FMPS – Parental expectations	11.6 (0.30)	12.30 (0.57)	*U* = 6550.50, *z* =-.600	.55	<.01
FMPS – Parental criticism	7.46 (3.33)	8.57 (4.26)	*U* = 5979.00, *z* =-1.67	.09	.01
FMPS – Doubts about actions**	9.23 (3.52)	10.98 (4.82)	*U* = 5470.50, *z* =-2.61	<.01	.02
FMPS – Personal standards	20.03 (6.11)	20.43 (6.85)	*U* = 6739.50, *z* =-.248	.80	.03
FMPS - Organisation	21.87 (4.16)	21.27 (6.06)	*U* = 6853.00, *z* =-.037	.97	<.01
Maladaptive Perfectionism*	49.48 (15.52)	55.53 (20.16)	*U* = 5815.50, *z* =-1.96	.05	.24

Note *= $p<0.05$, ** = $p<0.01$ ***= $p<0.001$,
Abbreviations included in Table 13: OUT'M = Over and Undercontrol Trait Measure, and FMPS = Frost Multi-Dimensional Perfectionism Scale,
Covariates were not analysed within the t-tests, these were included in the regression analyses to explore their predictive value and control for their effect on the OUT'M score.

2.3.6 Hypothesis 2: Self-control as a predictor of mental health

The second hypothesis explored whether women with higher scores on the OUT'M, those with a predominantly over-controlled coping style, were more likely to experience mental health difficulties and were more likely to experience internalised disorders such as depression and anxiety. In addition, this hypothesis also explored whether individuals with lower scores on the OUT'M, those with an under-controlled coping style, experience externalising disorders such as borderline personality disorder, bipolar affective disorder, and psychosis.

The first logistic regression explored whether higher scores on the OUT'M predicted meeting the clinical threshold for a mental health difficulty. This regression model (outlined in Table 14) was not statistically significant, indicating that higher scores of overcontrol, as measured by the OUT'M, were not predictive of mental health difficulties within this sample (χ^2 (1) = 1.14, *p* =.28).

Table 14. *Logistic regression model OUT'M and mental health difficulties.*

Predictor	B	SE	Wald	Odds Ratio Exp (B)	95% CI	
					Lower	Upper
OUT'M	-.01	.01	1.13	.99	.97	1.01
Constant	.08	.83	.01	1.85		

Note. * = *p*<.01, *Abbreviations included in Table 14: OUT'M = Over and Undercontrol Trait Measure.*

Due to significant between group differences on two of the subscales of the OUT'M, a further logistic regression analysis was carried out with the subscales as predictor variables (Table 15), and this model was significant (χ^2 (1) = 28.59, *p* <.01; Nagelkerke R square = .150; Hosmer and Lemeshow χ^2 (8) = 2.16, *p* = .98). Both the inhibition and the detachment subscales were significant predictors for meeting a clinical cut-off score: the odds ratios suggest that with each point decrease in OUT'M - Inhibition scores participants were .92 more likely to reach the clinical threshold for mental health difficulty, and with each point increase in OUT'M - Detachment scores participants were 1.08 more likely to reach the clinical threshold for mental health difficulty. The need for structure subscale was not a significant predictor of mental health difficulties.

Table 15. *Logistic regression model showing OUT'M subscales as predictors of mental health difficulties.*

Predictor	B	SE	Wald	Odds Ratio Exp (B)	95% CI	
					Lower	Upper
OUT'M – Need for structure	-.02	1.19	10.91	.98	.95	1.00
OUT'M – Inhibition*	-.08	.02	10.91	.92	.88	.97
OUT'M – Detachment*	.07	.02	10.89	1.08	1.02	1.12
Constant	2.46	1.19	4.30	11.71		

Note. * = *p*<.01, *Abbreviations included in Table 14: OUT'M = Over and Undercontrol Trait Measure.*

To gather a more detailed understanding of the types of disorders the OUT'M predicts the participants were split according to their type of disorder. It was hypothesised that individuals with overcontrolled coping styles were more likely to experience internalising disorders such as depression and anxiety. Therefore, the second binary logistic regression analysis explored whether higher scores on the OUT'M were predictive of reaching the clinical threshold for an internalising

disorder. This model (outlined in Table 16) was not statistically significant, indicating that higher scores on the OUT'M were not predictive of internalising disorders within this sample (χ^2 (1) = .16, p =.69), thus disconfirming the hypothesis that overcontrolled individuals experience internalised disorders.

Table 16. *Logistic regression model OUT'M and internalising difficulties.*

Predictor	B	SE	Wald	Odds Ratio Exp (B)	95% CI	
					Lower	Upper
OUT'M	.01	.01	.16	1.01	.98	1.02
Constant	-1.57	.91	2.95	.21		

Note. Abbreviation included in Table 15: OUT'M = Over and Undercontrol Trait Measure.

When the OUT'M subscales were entered as predictor variables, none of the subscales were significantly predictive of internalising disorders (χ^2 (3) = 5.99, p =.11, Table 17).

Table 17. *Logistic regression model showing OUT'M subscales as predictors of internalising mental health difficulties.*

Predictor	B	SE	Wald	Odds Ratio Exp (B)	95% CI	
					Lower	Upper
OUT'M – Need for structure	-.001	.02	.009	.99	.97	1.029
OUT'M – Inhibition	-.03	.02	1.42	.97	.94	1.092
OUT'M – Detachment	.04	.02	3.57	1.044	.99	1.029
Constant	-.63	1.06	.36	.53		

Note. Abbreviation included in Table 16: OUT'M = Over and Undercontrol Trait Measure.

The final binary logistic regression model explored whether scores on the OUT'M were predictive of externalising disorders, classified as bipolar affective disorder, borderline personality disorder or psychosis. This model (outlined in Table 18) was statistically significant, indicating that lower scores on the OUT'M were predictive of externalising disorders within this sample (χ^2 (1) = 8.28, p <.01; Nagelkerke R square = .06; Hosmer and Lemeshow χ^2 (8) = 6.99, p = .54). The odds ratios suggest that with each point decrease in OUT'M score participants were .96 more likely to reach the clinical threshold for an externalising disorder. Thus, confirming the final part of hypothesis two.

Table 18. *Logistic regression model OUT'M and externalising difficulties.*

Predictor	B	SE	Wald	Odds Ratio Exp (B)	95% CI	
					Lower	Upper
OUT'M*	-.04	.02	7.65	.96	.93	.99
Constant	1.41	1.31	1.31	4.11		

Note. * = p<.01. *Abbreviation included in Table 17: OUT'M = Over and Undercontrol Trait Measure.*

This was explored further using the subscales of the OUT'M (outlined in Table 19), which indicated that all three subscales were predictive of externalising disorders (χ^2 (3) = 32.06, p <0.01; Nagelkerke R square = .24; Hosmer and Lemeshow χ^2 (8) = 8.04, p = .43). Externalising disorders were predicted by lower scores on the scales for need for structure (OR: 0.95) and inhibition (OR: 0.89) and higher scores on the scale for detachment (OR: 1.08).

Table 19. *Logistic regression model showing the subscales of OUT'M as predictors of externalising difficulties.*

Predictor	B	SE	Wald	Odds Ratio Exp (B)	95% CI	
					Lower	Upper
OUT'M – Need for structure*	-.05*	.02	5.79	.95	.90	.99
OUT'M – Inhibition*	-.11*	.03	15.99	.89	.85	.94
OUT'M – Detachment*	.08*	.03	6.16	1.08	1.02	1.15
Constant	2.87	1.38	4.32	17.72		

Note. * = p<.05. *Abbreviation included in Table 17: OUT'M = Over and Undercontrol Trait Measure.*

2.3.7 Other possible predictors

Risk factors identified within the literature, and the possible covariates within the sample were explored using a series of stepwise logistic regression analyses. These covariates included; age (split into; young <25, and older >35), household income (under £25,000), history of mental health difficulties and perfectionism. These risk factors were entered within the first block, this was significant (χ^2 (5) = 22.65, p <.01; Nagelkerke R square = .12; Hosmer and Lemeshow χ^2 (8) = 9.12, p = .33, Table 20), the addition of OUT'M in the second block did not contribute significantly to the model (χ^2 (1) = .37, p = .53). Of the previously identified risk factors, age (under 25) was the only significant variable within the model, with the odds of reaching a clinical threshold increasing by 3.12.

Table 20. *Predictive value of risk factors for achieving a clinical cut-off score within a perinatal sample.*

Predictor	B	SE	Wald	Odds Ratio Exp (B)	95% CI Lower	95% CI Upper
Block 1						
Previous mental health	.45	.31	2.18	1.57	.86	2.87
Age <25*	1.17	.42	2.17	3.22	1.42	7.27
Age >35	.62	.42	2.17	1.87	.81	4.27
Low income <£25000	.34	.40	.72	1.40	.64	3.06
Perfectionism FMPS	.01	.007	2.93	1.01	.99	1.02
Constant	-2.24	.53	17.78	.11		
Block 2						
Previous mental health	.44	.31	2.05	1.55	.85	2.84
Age <25*	1.14	.42	7.41	3.12	1.38	7.10
Age >35	.66	.43	2.38	1.93	.84	4..47
Low income <£25000	.31	.40	.58	1.36	.62	2.98
Perfectionism FMPS	.01	.007	3.21	1.01	.99	1.02
OUT'M	-.006	.10	.39	.99	.97	1.01
Constant	-1.72	.98	3.07	.18		

Note. * = p<.01. *Abbreviations included in Table 18: OUT'M = Over and Undercontrol Trait Measure, and FMPS = Frost Multi-Dimensional Perfectionism Scale.*

The findings within hypotheses one and two suggested the subscales of the perfectionism: doubts about actions and maladaptive evaluative concerns, and overcontrol: detachment, need for structure and inhibition, were predictive of mental health difficulties. To assess their predictive value, the subscales of the FMPS and OUT'M were entered into a stepwise regression model with the perfectionism subscales in block 1. This model was significant (χ^2 (3) = 20.86, p <0.01; Nagelkerke R square = .11; Hosmer and Lemeshow χ^2 (8) = 8.51, p = .38), and the overcontrol subscales in block 2, this model was significant, indicating that the scales of overcontrol increased the predictability of the model (χ^2 (6) = 37.31, p <0.01; Nagelkerke R square = .19; Hosmer and Lemeshow χ^2 (8) = 6.94, p = .54). The second model including the OUT'M subscales increased the percentage of variability accounted for within the model by 8%. Of the subscales, both inhibition and the detachment were significant predictors for meeting the threshold for clinical membership: the odds ratios suggest that with each point decrease in OUT'M - Inhibition scores participants were .92 more likely to reach the clinical threshold for mental health difficulty, and with each point increase in OUT'M - Detachment scores participants were 1.07 more likely to reach the clinical threshold for mental health difficulty. The need for structure was not significant within this model. Both models outlined in Table 21.

Table 21. *Predictive value of the risk factors, subscales of FMPS and OUT'M for achieving a clinical cut-off score within a perinatal sample.*

Predictor	B	SE	Wald	Odds Ratio Exp (B)	95% CI	
					Lower	Upper
Block 1						
Age <25**	1.21	.37	10.63	3.34	1.62	6.89
FMPS-Doubts over actions	.08	.055	2.02	1.08	.97	1.20
FMPS-Maladaptive evaluative concerns	.006	.013	.206	1.01	.98	1.03
Constant	-2.09	.47	20.12	.12		
Block 2						
Age <25**	1.13	.41	7.69	3.09	1.39	6.86
FMPS-Doubts over actions	.04	.06	.43	1.04	.93	1.17
FMPS-Maladaptive evaluative concerns	-.003	.014	.06	.99	.97	1.02
OUT'M – Need for structure	-.013	.016	.67	.98	.96	1.02
OUT'M – Inhibition*	-.07	.027	7.94	.92	.88	.98
OUT'M – Detachment*	.06	.024	7.40	1.07	1.02	1.12
Constant	1.64	1.45	1.27	5.14		

Note. * = $p<.01$ **$p<.001$. *Abbreviations included in Table 20: OUT'M = Over and Undercontrol Trait Measure, and FMPS = Frost Multi-Dimensional Perfectionism Scale.*

2.4 Discussion

This study aimed to investigate self-control in a perinatal population, as defined by Lynch, Hempel and Clark (2015), and explore the relationship between overcontrol and perinatal mental health disorders. The main aim was to improve the understanding of the role of the self-control coping styles within the development of mental health difficulties during the perinatal period. As far as the author is aware, this is the first study of its kind within the perinatal population.

2.4.1 Main findings

The prevalence of mental health difficulties within this sample was 31%, of which 18% met the clinical cut off for depression, 17% for anxiety, 4% for bipolar disorder and 8% for psychosis. Previous population studies have estimated the prevalence rates for perinatal mental health range between 10-20% (O'Hara & Swain, 1996, Royal College of Obstetricians and Gynaecologists, 2017). The prevalence rates within this study are higher than within previous studies. A recent report identified that perinatal mental health difficulties are typically underreported due numerous factors including repeated changes in healthcare professional and stigma and lack of awareness (RCOG, 2017), indicating that these higher rates may be more representative of the perinatal population.

This study identified that there were no significant differences in the scores of self-control between the clinical and non-clinical groups, thereby disconfirming the hypothesis that women with perinatal mental health difficulties are more overcontrolled than healthy controls. However, when comparing the two groups on the subscales of the OUT'M, significant differences were found indicating that participants within the clinical group had higher scores of detachment and lower scores of inhibition. When entered into a regression analyses, these findings were confirmed, the total score of self-control was not predictive of membership to the clinical group, however, higher scores of detachment and lower scores of inhibition were predictive of mental health difficulties, remaining consistent when controlling for previously identified risk factors such as age, income and perfectionism.

The neurobiosocial model of overcontrolled disorders proposes three main elements of psychological wellbeing; (1) receptivity and openness, (2) flexible control and intimacy and (3) connectedness with others (Lynch, Hempel & Clark, 2015). Although this study was unable to confirm that the overcontrolled coping style was predictive of mental health difficulties, it did confirm that detachment from others, or low social connectedness, was indicative of mental health difficulties. Typically, the lack of social connectedness with others manifests as; aloof and distant relationships, feeling different from other people, frequent social comparisons, high envy and

bitterness, and reduced empathy. For women experiencing mental health difficulties these comparisons, feeling of envy, bitterness and difference can be stronger due to the perceived inability to cope when others can, thus reinforcing the lack of social connectedness. This detachment may lead to feelings of detachment from their infants, reducing their ability to engage in attuned interactions or altering their perception of their attachment relationship, and potentially leading to actual or perceived attachment difficulties. The undercontrolled coping style was supported by the findings of lower scores of on the scale of inhibition predicting the presence of mental health difficulties. Individuals with low inhibitory control exhibit more impulsive, dramatic, and erratic behaviours. Disinhibited behaviour during the perinatal period may lead to difficulties in engagement with support systems and inconsistencies in care for the infant.

Previous literature has categorised mental health difficulties within internalising and externalising disorders (Crijnen, Achenbach, & Verhulst, 1997), which can be broadly mapped onto the disorders of over and undercontrol. Contrary to the hypotheses, internalising disorders were not predicted by higher scores of overcontrol, nor by the subscales of the OUT'M. Despite these classifications of disorder theoretically mapping well onto overcontrolled, the findings from this study did not support the classification proposed by Achenbach and colleagues (Achenbach, 1966, Achenbach & Edelbrock, 1984, Crijnen, Achenbach, & Verhulst, 1997). The findings supported the lack of social connectedness and the undercontrolled coping style indicate that this theory is still applicable to this population, however the methods of measurement may not have been effective to explore it fully.

As predicted, the results within this study confirmed that lower scores of overcontrol were predictive of externalising disorders. The subscale analysis further showed that increased detachment and decreased inhibition and need for structure increase the odds ratio for meeting the clinical cut-off for an externalising disorder, confirming the theorised difficulties within undercontrol. It is of note, that none of the women within the sample met the clinical cut off for borderline personality disorder; instead, those classed as having an externalising disorder met the clinical cut off for psychosis and bipolar affective disorder. Typical presentations of psychosis include; delusions, hallucinations, pressure of speech, increased disorganised behaviours, and social withdrawal (APA, 2013). The presentation of bipolar affective disorder typically includes; emotional lability, delusions, and impulsive behaviour (APA, 2013). This symptomology indicates that individuals with these disorders do not prefer order or structure, are likely to have difficult interpersonal relationships and to have high emotional expression and disinhibition. Therefore, individuals with these disorder presentations are likely to have lower scores on the OUT'M scale of need for structure, low inhibition, and increased detachment from others. Despite, the inconclusive findings for overcontrol within this study, the confirmation of undercontrolled difficulties, and the indication that higher scores of detachment, and lower scores of inhibition are predictive of mental health difficulties suggests that this theory may still be relevant to this population.

Previously identified risk factors

This study explored the function of perfectionism in the development of perinatal mental health difficulties. Numerous studies have found that high levels of perfectionism are associated with higher levels of distress within the perinatal population (Macedo et al., 2009, Gelabert et al., 2012, Maia et al., 2012, & Oddo-Somerfield et al., 2016), particularly for those who have social risk factors including poor relationships or an absence of social support (Howard et al., 2014). A large amount of evidence suggests that perfectionism is predictive of perinatal mental health difficulties either directly (Dimistrovsky, 2002, Gelabert et al., 2012, Macedo et al., 2009) or indirectly (Oddo-Somerfield et al., 2016). Previous studies have explored the role of perfectionism within the context of eating difficulties, body dissatisfaction and marital satisfaction, samples which typically have been found to have higher levels of perfectionism (Mazzeo et al., 2006, Dimistrovsky, 2002, Sweeney & Fingerhut, 2013).

Perfectionism was measured within this study due to the potential overlap in clinical presentation of an overcontrolled disorder and clinical perfectionism. The total score on the Frost Multidimensional Perfectionism Scale was not predictive of mental health difficulties. However, increased scores on the subscales 'doubts about actions' and 'maladaptive evaluative concerns' did predict membership to the clinical group, confirming previous findings within Gelabert et al. (2012). Individuals scoring highly on these scales typically display the following patterns of behaviour; excessive checking, being overly cautious, constantly trying to improve by re-doing things, strong attention to detail, and avoidance of new things or tasks that may lead to failure. The FMPS and the OUT'M were significantly correlated, it is possible that these perfectionism subscales are linked to the underlying traits of overcontrol, such as; high trait moral certitude, high trait compulsive striving, and high trait detail-focused processing. Therefore, it is likely that the measure of overcontrol was not effective at distinguishing between trait perfectionism and an overcontrolled coping style.

The final variable predictive of mental health difficulties was age, women within the 'young' category (<25 years old), increasing the risk more than any other variable included in the study. Previous literature has highlighted that younger mothers are almost twice as likely to experience depression during this time, however, this has predominantly focused on adolescent mothers (Troutman & Cutrona, 1990, Birkeland, Thompson, & Phares, 2005, Reid & Meadows-Oliver, 2007). It has been hypothesised that this is often due to poor social support, financial hardship, unwanted pregnancy, increased family conflict, and lack of stable partner (Rich-Edwards et al., 2006, Reid & Meadows-Oliver, 2007, Jenkins, 2013). These findings indicate that perhaps this risk continues following the adolescent years into early adulthood, contrary to the previous understanding of this risk factor (Robertson et al., 2004).

2.4.2 Implications

Primarily this study aimed to explore the theoretical model of overcontrol as proposed by Lynch, Hempel and Clark (2015). The findings from this study partially support this model. Indicating that it is likely to be applicable to this population, however improved screening and assessment tools are required to accurately assess an individual's coping style.

The current study identified that 31% of women met the clinical threshold for a mental health difficulty. This is higher than previous estimations of prevalence within this population, indicating a higher proportion of women requiring support during the perinatal period than previous research suggests. As highlighted previously, the strongest risk factor was maternal age indicating that women under the age of 25 were more at risk of developing mental health difficulties. Mental health screening is routine within antenatal and postnatal services (NICE, 2014), however, this may not be the most appropriate identification method for those experiencing mental health difficulties. Of the present clinical sample, 20% of women reported to be currently accessing treatment for their mental health difficulties, indicating that women are struggling to access support, therefore increasing access and availably within services for all aged mothers is essential.

Previous research exploring the role of perfectionism as a vulnerability factor for depression has highlighted that these individuals hold themselves to extremely high standards (Frost et al., 1990, Shafran & Mansell, 2001), thus making it very difficult to ask for support as this would be perceived as a sense of failure. For an individual feeling detached from others, asking for support is going to be very difficult. Therefore, accessing mental health support or social support during the perinatal period would benefit from being made easier. Adaptions to the routine information provided to women during the antenatal period normalising the experience of becoming a parent, the acceptability of asking for help, and effectively communicating with others regarding their support needs.

The Division of Clinical Psychology (BPS, 2015) recommends clinical psychology input across the perinatal period in a variety of settings. The findings from this research suggest that clinical psychologists can be effective in supporting the psychoeducation provided in the antenatal period. This would be the ideal time to promote the idea of being flexible as a parent, increasing social support and provide advice regarding accessing support when needed in or to normalise the experience and reduce the feelings of detachment from others. For those requiring mental health support during the perinatal period clinical psychologists would be best placed to develop formulations for treatment both by clinical psychologists and other professionals. The findings from this study indicate that psychological interventions should focus on decreasing feelings of detachment, increasing emotional and behavioural inhibition, and reducing the maladaptive traits of perfectionism; such as; increased doubt about actions and concerns over mistakes.

Previous research examining the role of self-control suggests that it is important to identify where on the spectrum people fall, to ensure targeted treatments can be offered, for example standard Dialectical Behaviour Therapy (DBT, Linehan, 1993, 2014) for severely under-controlled personality styles, Cognitive Behaviour Therapy (CBT) for those amongst the more flexibly controlled, and Radically Open-Dialectical Behaviour Therapy (RO-DBT, Lynch, in press) for individuals with a severely over-controlled personality style. This requires further exploration within the perinatal population.

2.4.3 Strengths of the current study

This study is the first to explore the role of self-control in the development of perinatal mental health difficulties. It is adding to the growing body of literature supporting the notion that the neurobiosocial theory of overcontrolled disorders (Lynch, Hempel & Clark, 2015) is applicable to numerous clinical populations. This study implemented a wide-ranging recruitment process aiming to access clinical and non-clinical samples through various means increasing the generalisability of the findings. The study collected a range of demographic data and additional personality trait measures, which were important in considering the previously researched risk factors that may contribute to the development of mental health difficulties. The recruitment enabled high generalisability, the sample population represented all ages, income levels and employment statuses, but not ethnic diversity. The administration of this study took relatively little time, indicating that it is possible to screen for mental health difficulties and coping styles within antenatal appointments to identify those most at risk and tailor the interventions provided. Previous research has found there continues to be a large amount of fear and stigma associated with mental health within this population, likely to be due feelings of shame, the worries around being a labelled ‘bad mother’ or social rejection (Bilszta, Ericksen, Buist, & Milgrom, 2010, Centre for Mental Health, 2015, Dunford & Granger, 2017), and it’s possible the online nature of this study and the anonymity reduced women’s reluctance to participate and thus increase generalisability of the study.

2.4.4 Limitations of the current study

The current study should be understood within the context of its limitations. First, all measures used in this study were self-report questionnaires, thereby introducing the possibility of social desirability bias and demand characteristics. The measures administered screening for mental health difficulties were identified as those used routinely within NHS services and widely within clinical research, all were short, timely to administer and well validated, allowing for the

identification of difficulties. The Psychiatric Disorder Screening Questionnaire was used for the assessment of psychosis, this identified a high proportion of women within the sample experiencing psychotic symptoms. This was the best available tool, however the measure had low internal reliability within this study, making it difficult to draw firm conclusions from the findings within the undercontrolled-externalising disorders regression analyses.

Each participants level of self-control was measured using a newly validated questionnaire, the Over-Undercontrolled Trait Measure (OUT'M, Seretis, Hempel, Smith-Lynch, & Lynch, personal communication). Despite this measure having strong internal consistency and reliability, the face and content validity within a clinical sample are unclear. This measure has previously been trialled within student samples, and with disorders that are more typically overcontrolled. The findings from this study suggest that the OUT'M does not effectively measure maladaptive overcontrol as hypothesized. It would appear effective at measuring undercontrol and flexible control, it is unclear whether the items within the scale effectively measure maladaptive overcontrol within a perinatal population. It may be adaptive for women within the perinatal period to score highly on items included within the scale of overcontrol (such as; organised, methodical, orderly, structured) to feel more able to parent an infant effectively. Therefore, the tool may be unable to decipher between adaptive and maladaptive overcontrol within this population.

The OUT'M was found to be predictive of an undercontrolled coping style and correlated moderately with perfectionism within this sample. The measure used descriptive words to identify the trait pattern, perhaps a question-style measure would have been better suited. It is possible that some of the wording within the measure targeted symptoms of the disorders included in the study, for example; a lack of inhibition within bipolar affective disorder and borderline personality disorder. It would have been beneficial for this study to have administered another measure of self-control such as the Assessing Style of Coping measure (Lynch, in press) or the OC Trait Rating Scale (Seretis, Hempel, Smith-Lynch, & Lynch, in press) to further validate the OUT'M within a clinical population.

A further limitation was the study design: a cross-sectional study design rather than a prospective longitudinal design was implemented to explore self-control within perinatal mental health difficulties. Women were recruited throughout the perinatal period including mothers both antenatally and postnatally, due to a recent shift in the understanding of perinatal mental health difficulties. However, this highlighted a number of confounding variables that were not measured including; whether the pregnancy was planned, birth type and birth experience. Whilst there were no identified differences between those participants who were pregnant and those who had recently given birth with regards to their mental health, this is a possible confounding variable.

In addition, the generalisability of the study may have been affected by sampling bias: despite many NHS sites advertising the study, the women for the most part accessed the study

through social media (77.86%), the numbers of participants within the clinical group were small, and when the clinical group was broken into disorder type this meant the sample size of the regression was small, leading to limitations within the applicability of the findings. Additional resources within the clinical areas would have helped balance the sample further and access a broader range of women.

Finally, this study explored only one of the other well-established personality risk factors identified in Chapter 1, perfectionism. It would have been beneficial to measure the other personality traits, i.e. neuroticism, self-criticism and dependency that have been previously identified as risk factors for mental health difficulties during the perinatal period, and may be an alternative explanation for the negative affectivity within overcontrol.

2.4.5 Directions for future research

This research has highlighted the importance of considering personality traits and coping styles in the development of mental health difficulties and the association this may have with providing suitable evidence-based treatments. It is important to continue to develop screening tools for overcontrolled and undercontrolled disorders within varying clinical samples to further its development and applicability. In addition, it would be beneficial to explore the relationship between self-control and perinatal mental health difficulties using a longitudinal, prospective design with matched controls to establish whether this transition to motherhood is mediated by the individual's level of self-control. Thus far, overcontrol has been explored and identified within chronic mental health difficulties (Lynch et al., 2013, 2015), and it would be of benefit to further explore its utility within purely clinical samples of varying severity.

It would also be of benefit to explore whether parenting style is directly linked to level of self-control, thus potentially informing the environments of the infants to enable them to be more flexibly controlled. It is possible that an individual's coping style may also influence the way in which they parent due to the way in which they have been parented themselves. This is of particular importance given the neurobiosocial theory of overcontrolled disorders placing an emphasis of coping style being reinforced within the environment, therefore the parents' coping style may influence coping style in child, which may result in increased odds for the child to develop mental health difficulties in adolescence or adulthood.

2.4.6 Conclusions

This is the first study exploring the role of self-control within perinatal mental health. Approximately 30% of the sample were experiencing a mental health difficulty, and that clinical membership was predicted by high detachment, and low inhibition. The role of self-control, and overcontrol in perinatal mental health difficulties was not fully supported in this study. Internalising disorders were not predicted by high score of overcontrol as hypothesised, however the findings supporting the link between externalising disorders and undercontrol coping styles indicate that this theory has potential relevance to this population. Further research is needed to advance upon this study to enable identification of at risk mothers and to target service development and treatment methods, with the aim of reducing the long-term impact on the mother, infant and wider family.

Appendices

Appendix A - Supplementary documentation for systematic literature review.

A1: QATQS Rating Scale.

QUALITY ASSESSMENT TOOL FOR QUANTITATIVE STUDIES

EPHPP
Effective Public Health Practice Project

COMPONENT RATINGS

A) SELECTION BIAS

(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?

1 Very likely
2 Somewhat likely
3 Not likely
4 Can't tell

(Q2) What percentage of selected individuals agreed to participate?

1 80 - 100% agreement
2 60 – 79% agreement
3 less than 60% agreement
4 Not applicable
5 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

B) STUDY DESIGN

Indicate the study design

1 Randomized controlled trial
2 Controlled clinical trial
3 Cohort analytic (two group pre + post)
4 Case-control
5 Cohort (one group pre + post (before and after))
6 Interrupted time series
7 Other specify _____
8 Can't tell

Was the study described as randomized? If NO, go to Component C.

No Yes

If Yes, was the method of randomization described? (See dictionary)

No Yes

If Yes, was the method appropriate? (See dictionary)

No Yes

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

C) CONFOUNDERS

(Q1) Were there important differences between groups prior to the intervention?

1 Yes
2 No
3 Can't tell

The following are examples of confounders:

1 Race
2 Sex
3 Marital status/family
4 Age
5 SES (income or class)
6 Education
7 Health status
8 Pre-intervention score on outcome measure

(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?

1 80 – 100% (most)
2 60 – 79% (some)
3 Less than 60% (few or none)
4 Can't Tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

D) BLINDING

(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?

1 Yes
2 No
3 Can't tell

(Q2) Were the study participants aware of the research question?

1 Yes
2 No
3 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

E) DATA COLLECTION METHODS

(Q1) Were data collection tools shown to be valid?

1 Yes
2 No
3 Can't tell

(Q2) Were data collection tools shown to be reliable?

1 Yes
2 No
3 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

F) WITHDRAWALS AND DROP-OUTS

(Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?

1 Yes
2 No
3 Can't tell
4 Not Applicable (i.e. one time surveys or interviews)

(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).

1 80 -100%
2 60 - 79%
3 less than 60%
4 Can't tell
5 Not Applicable (i.e. Retrospective case-control)

RATE THIS SECTION	STRONG	MODERATE	WEAK	
See dictionary	1	2	3	Not Applicable

G) INTERVENTION INTEGRITY

(Q1) What percentage of participants received the allocated intervention or exposure of interest?

1 80 -100%
2 60 - 79%
3 less than 60%
4 Can't tell

(Q2) Was the consistency of the intervention measured?

1 Yes
2 No
3 Can't tell

(Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?

4 Yes
5 No
6 Can't tell

H) ANALYSES

(Q1) Indicate the unit of allocation (circle one)

community organization/institution practice/office individual

(Q2) Indicate the unit of analysis (circle one)

community organization/institution practice/office individual

(Q3) Are the statistical methods appropriate for the study design?

1 Yes
2 No
3 Can't tell

(Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?

1 Yes
2 No
3 Can't tell

Appendix A

GLOBAL RATING

COMPONENT RATINGS

Please transcribe the information from the gray boxes on pages 1-4 onto this page. See dictionary on how to rate this section.

A	**SELECTION BIAS**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
B	**STUDY DESIGN**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
C	**CONFOUNDERS**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
D	**BLINDING**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
E	**DATA COLLECTION METHOD**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
F	**WITHDRAWALS AND DROPOUTS**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	Not Applicable

GLOBAL RATING FOR THIS PAPER (circle one):

1	STRONG	(no WEAK ratings)
2	MODERATE	(one WEAK rating)
3	WEAK	(two or more WEAK ratings)

With both reviewers discussing the ratings:

Is there a discrepancy between the two reviewers with respect to the component (A-F) ratings?

No Yes

If yes, indicate the reason for the discrepancy

1	Oversight
2	Differences in interpretation of criteria
3	Differences in interpretation of study

Final decision of both reviewers (circle one):

1	**STRONG**
2	**MODERATE**
3	**WEAK**

Table A1. *The QATQS ratings for each article.*

Article	Selection Bias	Study Design	Confounding variables	Blinding	Data Collection	Withdraw/ Drops outs	Global rating
Boyce et al., 1991	Moderate	Moderate	Weak	Weak	Strong	Weak	Weak
Bunevicius et al., 2009	Moderate	Moderate	Strong	Moderate	Strong	Strong	Strong
Canals et al., 2002	Weak	Moderate	Strong	Moderate	Strong	Moderate	Moderate
Dimistrovsky, 2002	Weak	Moderate	Strong	Moderate	Moderate	Strong	Moderate
Gelabert et al., 2012	Moderate	Moderate	Moderate	Moderate	Strong	Moderate	Strong
Guszkowska et al., 2014	Weak	Weak	N/A	Weak	Strong	N/A	Weak
Gutierrez-Zotes et al., 2015	Moderate	Moderate	Moderate	Moderate	Strong	Moderate	Strong
Ilandis et al., 2015	Moderate	Moderate	Strong	Moderate	Strong	Weak	Moderate
Ilandis et al., 2017	Moderate	Moderate	Moderate	Moderate	Strong	Weak	Moderate
Imsiragic et al., 2014	Moderate	Moderate	Strong	Moderate	Strong	Moderate	Strong
Kennerley et al., 1989	Moderate	Moderate	Strong	Moderate	Weak	Strong	Moderate
Kumar et al., 1984	Moderate	Moderate	Moderate	Moderate	Weak	Strong	Moderate
Lee et al., 2000	Moderate	Moderate	Moderate	Moderate	Strong	Moderate	Strong
Macedo et al., 2009	Moderate	Weak	Moderate	Moderate	Strong	N/A	Moderate
Maia et al., 2012	Moderate	Moderate	Moderate	Weak	Strong	Weak	Weak
Marin-Morales, 2014	Moderate	Moderate	Strong	Moderate	Strong	Weak	Moderate
Martin-Santos et al., 2012	Strong	Moderate	Strong	Moderate	Strong	Moderate	Strong
Meares et al., 1972	Moderate	Moderate	Moderate	Moderate	Strong	Strong	Strong
Oddo-Somerfield et al., 2016	Weak	Moderate	Moderate	Moderate	Strong	Strong	Moderate
Periacoba-Puente et al., 2016	Moderate	Moderate	Moderate	Moderate	Strong	Weak	Moderate
Podolska et al., 2010	Moderate	Weak	Moderate	Weak	Strong	N/A	Weak
Saisto, 2001	Weak	Moderate	Moderate	Moderate	Strong	Weak	Weak
Sweeney & Fingerhut, 2013	Moderate	Moderate	Moderate	Moderate	Strong	Weak	Moderate
van Bussel et al., 2009a	Moderate	Moderate	Moderate	Weak	Strong	Weak	Weak
van Bussel et al., 2009b	Moderate	Moderate	Moderate	Weak	Strong	Weak	Weak
Verkerk et al., 2005	Strong	Moderate	Strong	Moderate	Strong	Strong	Strong

A2: Measures tables

Table A2. Utilisation of general personality measures within the reviewed studies.

Measure	Description of measure	Study	Personality trait (s) measured	Reliability within study	Stage (s) administered
Eysenck Personality Inventory (Eysenck & Eysenck, 1964)	57-item self-report questionnaire, scored on a 'yes' 'no' scale. Split across 3 subscales; Neuroticism, extraversion and lie.	Boyce et al., 1991 Kennerley et al., 1989 Meares, 1972	Neuroticism and extraversion Neuroticism Neuroticism and extraversion	Original manuscript - reasonable reliability (Eysenck & Eysenck, 1964) Reliability not reported in Boyce et al., Kennerley et al., or Meares, 1972.	Baseline (13-27 weeks antenatally) Baseline (14-16 weeks antenatally) Antenatally or postnatally
Eysenck Personality Questionnaire (Eysenck & Eysenck, 1965, 1975)	100-item self-report questionnaire, scored on a 'yes' 'no' scale. Split across 3 subscales; Neuroticism, extraversion and psychoticism.	Kumar et al., 1984 Lee et al., 2000	Neuroticism, psychoticism, and extraversion Neuroticism	Original manuscript - reliability .68 for females (Eysenck & Eysenck, 1975) Reliability not reported in Kumar et al., or Lee et al.	Baseline (12 weeks antenatally) and T7 (26 weeks postnatally) Baseline (2 days postnatally)
Eysenck Personality Questionnaire – Revised Shortened (Eysenck & Eysenck, 2001)	A 48-item self-report questionnaire from the EPQ-R. Scored on a 'yes' 'no' scale. Measuring 3 dimensions of personality.	Gelabert et al., 2012 Gutierrez-Zotes et al., 2015 Martin-Santos et al., 2012	Neuroticism, psychoticism, and extraversion Neuroticism, psychoticism, and extraversion Neuroticism, psychoticism, and extraversion	Reliabilities >.80 for N & E, .60 for P (Eysenck et al., 1985). Gelabert et al.: internal consistency (a=.71-.86) and test re-test reliability (.72-.86). Reliability not reported in Gutierrez-Zotes et al., or Martin-Santos et al.	Once post-remission or postnatally for controls Baseline (2-3 days postnatally) Baseline (2-3 days postnatally)
Eysenck Personality Questionnaire – Adults (Eysenck & Eysenck, 1992)	A 94-item self-report questionnaire. Scored on a 'yes' 'no' scale.	Canals et al., 2002	Neuroticism, psychoticism, and extraversion	Canals et al. (2002): internal consistency a= .70 – .85 across the three dimensions.	Baseline (pre-conception)

Measure	Description of measure	Study	Personality trait (s) measured	Reliability within study	Stage (s) administered
Big Five Personality Inventory (John & Srivastava, 1999)	Subscales used consisted of 8-items each. Scored on a 5-point Likert scale (1 strongly disagree – 5 strongly agree).	Bunevicius et al., 2009 – Translated to Lithuanian not validated	Neuroticism and extraversion	Original manuscript – alpha reliabilities range from .78-.90. Reliability of measure not reported in Bunevicius et al. 2009	T2 (22-26 weeks antenatally)
Big Five Inventory (Benet-Martinez & John, 1998)	A 44-item self-report questionnaire assessing 5 personality dimensions on 5-point Likert scale (1 strongly disagree – 5 strongly agree).	Imsiragic et al., 2014	Neuroticism, extraversion, openness, agreeableness, & conscientiousness	Reliability ranges from .75-.90 (Pervin, & John, 1999). Croatian sample internal reliability varies from *a*= .69-.80 (Hudek-Knezevic & Kardum, 2009).	Baseline (3-5 days postnatally)
NEO-Five Factor Inventory (Costa & McCrae, 1992)	Short form: 55-item self-reported questionnaire. Rated on a 5-point scale.	Guszkowska et al., 2014 Podolska et al., 2010 – Polish version (Zawadzki et al., 1998) Saisto et al., 2001 van Bussel et al., 2009 (a&b)– Dutch version	Neuroticism, extraversion, openness, agreeableness, & conscientiousness	Original manuscript -adequate internal consistency across all subscales (mean .78, Costa & McCrae, 1992) Internal reliability in Polish samples vary from *a*= .82 – .68 (Zawadzki et al, 1998). Saisto et al. reported *a*= .71-.78 van Bussel et al. reported internal reliability between a= .64-.75	Antenatally (17-36 weeks) Either antenatally or postnatally T1,2,3 (pre-and post-30 weeks antenatally and 2-3 months postnatally) T2 (26 weeks antenatally)
NEO-Five Factor Inventory (Seisdedos, 1999)	A 60-item self-report measure on a Likert scale from 0-4.	Periacoba-Puente et al., 2016 – Spanish version	Neuroticism, extraversion, openness, agreeableness, & conscientiousness	Original manuscript - reliability consistently >.70. Reliability of measure in study not reported.	Baseline (12-13 weeks antenatally)
NEO- PI – R (Costa & McCrae, 1999)	A 60-item self-report measure on a Likert scale from 0-4.	Marin-Morales, 2014 – Spanish version	Neuroticism, extraversion, openness, agreeableness, and conscientiousness	Original manuscript -internal consistency of the NEO PI-R is high: N *a* = .92, E *a* = .89, O *a* = .87, A *a* = .86, C *a* = .90 Costa & McCrae, 2010).	T1 (14 weeks antenatally) and T2 (16-17 weeks postnatally)

Measure	Description of measure	Study	Personality trait (s) measured	Reliability within study	Stage (s) administered
				Cronbach's *a* = .70-.86 in Marin-Morales.	
Swedish University Scale of Personality (Schaling et al., 1994)	Self-rating questionnaire with 91 statements to be rated on a Likert scale from 1-4. Forms 13 scales on 3 factors.	Ilandis, 2015	Neuroticism, aggressiveness, and extraversion	High face validity and internal consistency (Gustavsson et al., 2000). Reliability of measure in study not reported.	T2 (32 weeks antenatally)
Swedish University Scale of Personality (Gustavsson et al., 2000)	Self-rating questionnaire with 91 statements to be rated on a Likert scale from 1-4. Forms 13 scales on 3 factors.	Ilandis, 2017	Neuroticism, aggressiveness, and sensation-seeking	Original manuscript - ranged from *a* =.59 to .84. Reliability of measure in study not reported.	T2 (32 weeks antenatally)

Table A3. Utilisation of personality measures assessing perfectionism within the reviewed studies.

Measure	Description of measure	Study	Personality trait (s) measured	Reliability	Stage (s) administered
Frost Multidimensional Perfectionism Scale (Frost et al., 1990)	35-item questionnaire measuring 6 dimensions of perfectionism. 5-point Likert scale (1 strong disagree – 5 strongly agree). 6 subscale scores and an overall score.	Gelabert et al., 2012 – Spanish version	Perfectionism	Original manuscript – internal consistency ranges from *a* = .77-.93. Gelabert et al.: good internal consistency (*a* = .93) and temporal stability (ICC = .89)	Postnatally (during first 6 months)
		Oddo-Somerfield et al., 2016 - German version	Concern over mistakes (9 items) and doubts about actions (4 items).	Cronbach's *a* = .84 for overall German scale. Concern for mistakes *a*=.89. Doubts about actions *a*= .70	Baseline (30 weeks antenatally)
		Sweeney & Fingerhut, 2013		Concern for mistakes scale had strong internal reliability	

Measure	Description of measure	Study	Personality trait (s) measured	Reliability	Stage (s) administered
			Concern over mistakes (9 items) and doubts about actions (4 items).	in this study *a*= .88, doubt about actions scale *a* = .84	Baseline (28 weeks antenatally) and T2 (2 months postnatally)
Hewitt-Flett Multidimensional Perfectionism Scale (Hewitt & Flett, 1989, 1991)	45-item scale divided into three subscales; self-oriented perfectionism, other-oriented perfectionism and socially-prescribed perfectionism. Statements are rated on a 7-point Likert scale (1 strongly disagree to 7 strongly agree).	Dimistrovsky et al., 2002	Perfectionism	Original manuscript – adequate levels of reliability and validity in psychiatric population. Adequate levels of concurrent validity. Reliability of measure in Dimistrovsky et al., not reported. Portuguese psychometric properties are good (Soares et al., 2003).	Antenatally (third trimester)
	.	Macedo et al., 2009 – Portuguese version (Soares et al., 2003)	Self-oriented perfectionism and socially-prescribed perfectionism	Macedo et al. (2009) reported strong internal reliability of the scales: total *a*= .90, SOP *a*= .89, SPP *a* =.82	Antenatally (third trimester, mean gestational age 32 weeks)
		Maia et al., 2012 – Portuguese version (Soares et al., 2003)	Self-oriented perfectionism and other-oriented perfectionism.	Maia et al. (2012) internal reliability was high SOP *a*=.89, SPP-OHS *a*=.82, SPP-CA *a*= .69	Baseline (antenatally in third trimester) and T2 (3 months postnatally)
Almost Perfect Scale-Revised (Slaney et al., 2001)	Discrepancy subscale, 12-items with 7-point Likert scale (1 strongly disagree to 7 strongly agree).	Sweeney & Fingerhut, 2013	Maladaptive perfectionism	Original manuscript - Slaney et al. reported that the internal consistency estimates of the APS-R ranged from .85 to .92. Sweeney & Fingerhut: *a*= .96.	Baseline (28 weeks antenatally) and T2 (2 months postnatally)

Table A4. Utilisation of additional personality measures within the reviewed studies.

Measure	Description of measure	Study	Personality trait (s) measured	Reliability	Stage (s) administered
Interpersonal Sensitivity Measure (Boyce & Parker, 1989)	36-item self-report questionnaire, scored on a 4-point Likert scale.	Boyce et al., 1991	Interpersonal sensitivity	Original manuscript - internal consistency estimates for the total score were .86 and .85. Demonstrated satisfactory internal consistency, *a* = .85, test re-test .70, (Boyce & Parker, 1989)	Baseline (13-27 weeks antenatally)
Dutch Personality Questionnaire (Luteijn, Starren, & Dijk, 1985)	36-item self-report on a 3-point scale.	Verkerk et al., 2005	Neuroticism and introversion	The reliability and validity of the DPQ are satisfactory (Luteijn et al., 2000). The internal consistencies of the DPQ-scales are satisfactory (range α between 0.86 and .67). Cronbach's neuroticism *a*= .85, introversion *a*= .87 in study.	Baseline (34 weeks antenatally)

Table A5. Utilisation of depression measures.

Measure	Type and description of depression measure (screen, symptom, or severity)	Study	Clinical cut off used	Reliability	Stage (s) administered
Beck Depression Inventory (Beck, Ward & Mendelson, 1961)	21- item measure of behavioural manifestations of depression. Assessing severity of symptoms.	Boyce, et al. (1991)	11+	Original manuscript high internal consistency and reliability (>0.85). Not stated within Boyce, et al. (1991).	Baseline (13-27 weeks antenatally) and T2, T3 (Postnatally at 1 and 6 months)
		Lee et al. (2000)	Not used.	High internal consistency and reliability with Chinese populations	

Measure	Type and description of depression measure (screen, symptom, or severity)	Study	Clinical cut off used	Reliability	Stage (s) administered
				(Shek, 1990). Not stated within Lee et al. (2000).	Baseline (postnatally 2nd day) and 6 weeks postnatally.
		Saisto et al. (2001)	Not used.	Saisto et al. (2001) Cronbach's *a* = 0.88	T1,2,3 (pre-and post-30 weeks antenatally and 2-3 months postnatally)
Beck Depression Inventory-II (Beck et al., 1996) – Portuguese version (Coelho et al., 2002)	21-item measure with four options under each item, ranging from not present (0) to severe (3). Split into three factor subscales; cognitive-affective, anxiety, and fatigue. Maximum score 63.	Macedo et al. (2009)	Not used.	Original manuscript coefficient alpha estimates of reliability for the BDI-II with outpatients .92 and .93 for nonclinical sample. Macedo et al. (2009) internal reliability total score *a*= 0.89, cognitive-affective *a*= 0.89, anxiety *a*= 0.67, and fatigue *a*= 0.65.	Antenatally (third trimester, mean gestational age 32 weeks)
		Maia et al. (2012)	12+ major depressive disorder, 11+ depressive disorder during pregnancy 11+ major depressive disorder, 10+ for depressive disorder postpartum.	Not stated.	Baseline (antenatally in third trimester) and T2 (3 months postnatally)
Simplified Beck Depression Inventory-V (Schmitt et al., 2006)	A 20-item scale rated on a 6-point Likert scale from 0 never to 5 almost always. Study eliminated items that confounded with pregnancy related difficulties.	Oddo-Somerfield et al. (2016)	35+ indicates depressive disorder	Internal consistency *a*= 0.93	Baseline (30 weeks antenatally) and postnatally (12 weeks)

Measure	Type and description of depression measure (screen, symptom, or severity)	Study	Clinical cut off used	Reliability	Stage (s) administered
Edinburgh Postnatal Depression Scale (Cox et al., 1987, Harris et al., 1989)	Screening tool for symptoms of postnatal depression. A 10-item self-reported measure. With a total possible score of 30, from 4-point Likert scale (0 no, never to 3 yes, most of the time). Captures mood of the last 7 days and excludes physical symptoms of depression often in measures.	Boyce, et al. (1991)	13+	Original paper by Cox et al. (1987) obtained a Cronbach's alpha of *a*= 0.87.	T2, T3 (Postnatally at 1 and 6 months)
		Gelabert et al. (2012) – Spanish version (Garcia-Esteve et al., 2003)	9/10+	Good psychometric properties for Spanish version reported by Navarro et al. (2007). Spanish version reports internal consistency of 0.81.	Baseline (postnatally 2nd day) and T2/T3 (postnatally at 8 and 32 weeks)
		Gutierrez-Zotes et al. (2015) – Spanish version (Garcia-Esteve et al., 2003)	9+	Not stated.	Baseline 2nd day postnatally and 8 and 32 weeks postpartum.
		Iliadis (2015)	13+ antenatal symptoms 12+ postnatal symptoms	Not stated.	Baseline antenatally at 17 weeks, T2,3,4 (antenatally 32 weeks, postnatally at 6 weeks and 6 months)
		Iliadis (2017)	13+ antenatal symptoms 12+ postnatal symptoms	Not stated.	Baseline antenatally at 17 weeks, T2,3,4 (antenatally 32 weeks, postnatally at 6 weeks and 6 months)
		Imsiragic et al. (2014) – Validated Croatian translation (Nakić Radoš et al., 2013)	9+	Not stated.	Postnatally at 6 weeks
		Marin-Morales (2014) – Spanish	9+	Cronbach's *a*= 0.88	Baseline (3-5 day postnatally) and postnatally 6-9 weeks.

Measure	Type and description of depression measure (screen, symptom, or severity)	Study	Clinical cut off used	Reliability	Stage (s) administered
		version (Garcia-Esteve et al., 2003)			
		Martin-Santos et al. (2012) – Spanish version (Garcia-Esteve et al., 2003)	10/11+ for major depression 9+	Not stated.	Postnatally (4 months)
		Oddo-Somerfield et al. (2016) – German version (Bergant et al., 1998)	10+	German version internal consistency of 0.81.	Postnatally (8 and 32 weeks)
		Periacoba-Puente et al. (2016) – Spanish version (Garcia-Esteve et al., 2003)	10/11+	Study internal reliability of 0.87.	Baseline (30 weeks antenatally) and postnatally (12 weeks)
		Podolska et al. (2010) – Polish version (Bielawka-Barorowicz (1995)	12+	Not stated.	Baseline (13-14 weeks antenatally) and postnatally (4 months)
		Sweeney & Fingerhut (2013)		Reliability in this study was strong, Cronbach's a= 0.83 during pregnancy and a= 0.86 during the postpartum period.	Either antenatally (32-40 weeks) or postnatally (3-5 days)

Appendix A

Measure	Type and description of depression measure (screen, symptom, or severity)	Study	Clinical cut off used	Reliability	Stage (s) administered
		van Bussel et al. (2009a, 2009b) – Dutch version (Pop et al., 1992)	9+ at risk for depression, 12+ diagnosis of depression	Within this study strong internal reliability Cronbach's, a = 0.80-0.84.	Completed at all 5 time points: baseline (8-15 weeks gestation), T2, T3, T4 and T5 (20-26 weeks and 30-36 weeks antenatally and 8-12 weeks and 20-25 weeks postnatally)
		Verkerk et al. (2005)	Not used.	Good psychometric properties and validated in the Netherlands (Pop et al., 1992).	Baseline 34 weeks gestation, T2, T3, T4 (postnatally at 3, 6, and 12 months postnatally).
Composite International Diagnostic Interview-Short Form (Kessler et al., 2006)	Symptom screening questionnaire for depression.	Bunevicius et al. (2009)	One positive response, led to further assessment using SCID-NP.	Not reported.	Baseline (antenatally 12-16 weeks) T2 and T3 (22-26 and 32-36 weeks)
Structured Clinical Interview DSM-III-R-NP (Spitzer et al., 1990)	Diagnostic tool to establish psychiatric diagnosis. Semi-structured interview. Module A and I. (Lithuanian translation, Bunevicius, 1995).	Bunevicius et al. (2009)	Women meeting diagnostic criteria were classified as a 'case'.	Not reported.	Only administered if women screen positively on CIDI-SF at any point (12-16, 22-26 and 32-36 weeks gestation)
	Modified to 6-week diagnosis. Chinese translation.	Lee et al. (2000)	Women meeting 2/5 diagnostic criteria.	Not reported.	Postnatally (6 weeks)
Structured Clinical Interview for DSM-IV (Depression	Diagnostic tool for major depressive episode.	Gelabert et al. (2012)	Women meeting diagnostic criteria for depression.	Inter-rater reliability kappa = 0.91.	Postnatally (2nd day)

Measure	Type and description of depression measure (screen, symptom, or severity)	Study	Clinical cut off used	Reliability	Stage (s) administered
module, First et al., 1997)					
Depressive Experiences Questionnaire (Blatt et al., 1976)	Measures experiences of depression. 2 subscales of a 66-item measure of depression assessing experiences associated with depression. Scales used are dependency and self-criticism. Items are rated on a 7-point Likert scale (1 strongly disagree – 7 strongly agree).	Dimistrovsky (2002)	None used.	Within study reported reliability is satisfactory in previous studies. Correlated with BDI.	Antenatally (third trimester)
Diagnostic Interview for Genetic Studies (Nurnberger et al., 1994)	Diagnostic tool for depressive 'caseness'. Structured clinical interview allowing for evaluation of the course, chronology, and comorbidity of depressive disorders. Sections on major depression, suicidal behaviour and a reduced section of mania were administered. Adapted for postpartum depression.	Gutierrez-Zotes et al. (2015) – Spanish version (Roca et al., 2007) Macedo et al. (2009) – Portuguese version (Azevedo et al., 1993, 1999) Maia et al., 2012 - Portuguese version (Azevedo et al., 1993, 1999) Martin-Santos et al., 2012 - Spanish version	Women meeting diagnostic criteria. Women meeting diagnostic criteria. Women meeting diagnostic criteria. Women meeting diagnostic criteria.	Original article reliability 0.73-0.95 (Nurnberger et al., 1994). Excellent inter-rater reliability, in Azevedo et al., 1993). Excellent inter-rater reliability, in Azevedo et al., 1993). Not stated.	Administered on the women who met the EPDS cut off postnatally at 8 and/or 32 weeks. Antenatally (third trimester, mean gestational age 32 weeks) Baseline (antenatally in third trimester) and T2 (3 months postnatally) Administered at 32 weeks to those who met EPDS cut off.

Appendix A

Measure	Type and description of depression measure (screen, symptom, or severity)	Study	Clinical cut off used	Reliability	Stage (s) administered
		(Roca et al., 2007)			
Operational Criteria Checklist for Psychotic Illness (McGuffin et al., 1991)	Assesses diagnoses. A 90-item checklist of signs and symptoms of psychiatric illness. Responses entered into a computer-generated algorithm to provide diagnoses.	Macedo et al., 2009 – Portuguese version (Azevedo et al., 1993, 1999)	Women meeting diagnostic criteria.	Not stated.	Antenatally (third trimester, mean gestational age 32 weeks)
		Maia et al., 2012 - Portuguese version (Azevedo et al., 1993, 1999)	Women meeting diagnostic criteria.	Not stated.	Baseline (antenatally in third trimester) and T2 (3 months postnatally)
Depression Self-Rating Scale (DRDS, APA, 2000)	Designed to cover criterion A for depressive disorders.	Ilandis, 2015	Women fulfilling criteria for DSM-IV A depression.	Inter-rater reliability kappa 0.87. High sensitivity and specificity (0.94 ad 0.96).	Postnatally (6 months)
Present State Examination (Wing et al., 1974)	Screening instrument designed to classify mental health disorders.	Kennerley et al., 1989	Women meeting diagnostic criteria.	Not stated.	Baseline (14-16 weeks antenatally), T2 and T3 (36-38 weeks antenatally and 12 weeks postnatally)
Montgomery & Asberg (1979)	10 item scales assessing symptoms of depression	Kennerley et al., 1989	Not stated.	Not stated.	Baseline (14-16 weeks antenatally), and T2 (12 weeks postnatally)
Symptom Check List-90R (Derogatis, 1977) – Spanish version (De las Cuevas et al., 1991)	A 90-item questionnaire measured on a 5 point Likert scale (0 not at all – 4 extremely). Subscale for depression administered.	Marin-Morales, 2014	Not stated.	Convergent validity with BDI and Hamilton Depression Scale. Current study Cronbach's *a*= 0.85	Baseline (14 weeks antenatally) and T2 (16-17 weeks postnatally)

Measure	Type and description of depression measure (screen, symptom, or severity)	Study	Clinical cut off used	Reliability	Stage (s) administered
Research Diagnostic Criteria (Spitzer et al., 1978)	Classifies minor and major depression based on a structured clinical interview.	Kumar et al., 1984	Meet criterion for major depressive disorder if meet one criterion and 5 additional criteria with a duration of 2 weeks. Women with 3 or 4 criteria were diagnosed with minor depressive disorder.	Not stated.	All time points (antenatally 12,24,36 weeks and postnatally 1,6,12,26,52 weeks and 4 years)
		Verkerk et al., 2005		Not stated.	Baseline 34 weeks gestation, T2, T3, T4 (postnatally at 3, 6, and 12 months postnatally).

Table A6. Utilisation of anxiety measures.

Measure	Type and description of anxiety measure (screen, symptom, or severity)	Study	Clinical cut off used	Reliability	Stage (s) administered
State Trait Anxiety Inventory (Spielberger, Gorsuch & Lushene, 1970, 1988)	Severity and intensity of anxiety. A 40-item questionnaire measured on a 4-point Likert scale.	Canals et al., 2002 – Spanish translation.	Not used.	Good internal consistency reported in study Cronbach's *a*=0.92 (STAI-S) and *a*= 0.85 (STAI-T)	Baseline, T2-T5 (antenatally 10, 30 weeks, postnatally 3 days and 3 months)
		Guszkowska et al., 2014 – Polish version (Wrzeniewski et al., 2002)	Not used.	Reliability of Polish version Cronbach's *a*=0.89	Administered once antenatally (17-36 weeks)
Anxiety Trait Inventory (STAI-R, Speilberger, Gorsuch & Lushene, 1983)	Measures anxiety traits. A 20-item self-administered questionnaire.	Gutierrez-Zotes et al., 2015	Not used.	Not reported in study.	Baseline (2nd day postnatally)

Measure	Type and description of anxiety measure (screen, symptom, or severity)	Study	Clinical cut off used	Reliability	Stage (s) administered
Taylor Manifest Anxiety Scale (Taylor, 1953)		Meares, 1972	Not used.	Not reported.	Antenatally once (various stages)
Trait Anxiety (unvalidated, Maia et al., 2012)	Trait anxiety. A 1-item anxiety question with 'yes' 'no' response options. Generated for this study.	Maia et al., 2012	Answers 'yes' to question	Not reported.	Baseline (antenatally in third trimester)
Symptom Check List-90R– Spanish version (Gonzalez de Rivera et al., 1989)	Assesses clinical symptoms of anxiety. Anxiety subscale. 90-items rated on a 5-point Likert scale (0 not at all to 4 extremely).	Periacoba-Puente et al., 2016	None used.	Previous studies have shown high internal consistency (Robles, Andreu & Pena, 2002. This study Cronbach's *a*= 0.77.	Antenatally (30 weeks)

Table A7. Utilisation of measures assessing anxiety and depression.

Measure	Type and description of measure (screen, symptom, or severity)	Study	Clinical cut off used	Reliability	Stage (s) administered
Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983)	14-item scale assessing severity of depression and anxiety. 7 anxiety questions and 7 depression related questions.	van Bussel et al., 2009a, 2009b– Dutch version (Spinhoven et al., 1997)	Not used.	Validated within this population by Herrmann (1997). Within this study strong internal reliability Cronbach's, *a* = 0.75-0.84.	Completed at all 5 time points: baseline (8-15 weeks gestation), T2, T3, T4 and T5 (20-26 weeks and 30-36 weeks antenatally and 8-12 weeks and 20-25 weeks postnatally)
Leeds scales for measuring Depression and	Screening tool for depression and anxiety.	Kennerley et al., 1989	Not stated.	Not stated.	Baseline (14-16 weeks antenatally), and T2 (12 weeks postnatally)

Measure	Type and description of measure (screen, symptom, or severity)	Study	Clinical cut off used	Reliability	Stage (s) administered
Anxiety (Snaith et al., 1976)					
General Heath Questionnaire (Goldberg et al., 1972)	Severity of mental health symptoms. 30-item screen of recent affective disturbance. Positive screen on 6 or more questions indicates a potential case.	Kumar et al., 1984	Positive screen on 6 or more items.	Not stated.	All time points (antenatally 12,24,36 weeks and postnatally 1,6,12,26,52 weeks and 4 years)
General Heath Questionnaire (1978)	Severity of mental health symptoms	Lee et al., 2000	Not stated.	Reliability with Chinese populations	Baseline (postnatally 2nd day) and 6 weeks postnatally.
General Health Questionnaire-28 (Goldberg & Williams, 2001)	Severity of mental health symptoms. 4 mental health indices; somatic symptoms, anxiety and insomnia, social dysfunctions, and symptoms of depression.	Guszkowska et al., 2014 – Polish version (Makowska & Merecz, 2001)	Sum of points created, no cut of used.	Reliability in Polish populations vary, Cronbach's a=0.77-0.93.	Administered once antenatally (17-36 weeks)
Profile of Mood States (McNair et al., 1971) – Portuguese version (Azevedo et al., 1991)	65 self-report items using the 5-point Likert Scale from 0 (not at all) to 4 (extremely).	Macedo et al., 2009	Not stated.	Reliability Cronbach's alpha for each scale was high. Anxiety a= 0.85, depression = 0.92, anger a= 0.92, vigour a= 0.78, fatigue a= 0.82, and confusion a= 0.68	Antenatally (third trimester, mean gestational age 32 weeks)
State Trait Anxiety Depression Inventory (Laux et al., 2013)	An 80-item self-report questionnaire aiming to distinguish between depression and anxiety. 4-point Likert scale ranging from 0 'not at all' to 3 'very much'.	Oddo-Somerfield et al. (2016)	Cut off scores not yet determined. T values used for enhanced anxiety t > 61 and extremely high t >70.	Internal consistency is high on both scales, anxiety a= 0.90, depression a= 0.87.	Baseline (30 weeks antenatally) and postnatally (12 weeks)

Appendix B - Supporting documentation for the empirical paper

B1: Recruitment outline and recruitment materials

(1) Research sites included: 2 NHS Trusts. Within these two sites NHS patients accessing perinatal mental health specialist services (inpatient and community) and local inpatient and outpatient midwifery departments, birthing centres and hospitals were invited to take part through the advertising of posters and leaflets alongside social media posts on the NHS pages.

(2) Participant information centres (PICs) included: 3 NHS Trusts. Across these three sites NHS patients attending local services for women within the perinatal period were recruited through poster and leaflets in waiting rooms and clinic spaces. These sites included; local primary care services such as IAPT, children's services and General Practitioner surgeries.

(3) Non-clinical sites: participants were recruited from a variety of sources. Recruitment posters and adverts were placed on notice boards in public areas after having sought permission from the relevant persons responsible. These included community centres and retail outlets serving the target population, such as; Sure start centres and the National Childbirth Trust (NCT) groups and Mama's & Papa's based in southern England. In addition to this online forums and social media sites were used to advertise the study. An advert was placed on the research pages on the following forums; netmums.com, and mumsnet.com, and posts were placed on social media sites such as; Facebook, Instagram and Twitter through the University of Southampton account and through the researchers account (a breakdown below in Table B1).

Appendix B

Table B1. *Social media recruitment schedule.*

Form of social media	Location of post
Twitter	@htinto – main timeline
	@sotonpsych – main timeline
Facebook	Personal account (Hannah Tinton - shared by friends)
	University of Southampton Psychology page
	Southampton Mums
	Southampton Baby & Toddler Forum
	Mummies & Mummies to bee (National page)
	Portsmouth Mum & Babies
	Portsmouth & Southsea NCT
	Southampton NCT
	Winchester mums to be and way beyond
	Pregnancy and mummys support chat (UK)
	Can I breatfeed here? UK - off topic group page
	We are Winchester mums to be
	Mummies Club for New Forest Village & Surrounding Areas
	New Forest Mummies
	Basingstoke NCT
	New Forest NCT
	Bournemouth and Poole mums and mummies to be
	Portsmouth, Fareham and Gosport bumps, babies and under 5's
Instagram	@MrsCoatesy_
Forums	
Netmums	Research forum page
Mumsnet	Research forum page
Charity advertisement	
Maternal Mental Health Society	News page
Birth Trauma Association	Posted on Twitter account
Hampshire Lanterns (peer support network)	Posted on Facebook page

Figure B1. *Social media advert.*

Social Media text accompanying advert:

Recruiting until 31st March
Hi All,

(I'm really sorry if this is the wrong place to post this but I was hoping you could help. Please delete if this is against group rules).

I am a third year trainee clinical psychologist at the University of Southampton. I am looking for soon to be mums and new mums to take part in an online survey for my thesis project.

If you are pregnant or have given birth in the past 12 months and are interested in taking part please click the link below. It takes about 20 minutes to complete.

https://www.isurvey.soton.ac.uk/19563

The password to enter the survey is 'baby'.

Please share with anyone else who you think might be interested in taking part. If you have any questions please feel free to message me. Thank you

Appendix B

Figure B2. *Leaflet used for advertisement.*

Who can take part?

We are looking for women who:

- Are 18 or over
- Are currently pregnant or
- Have given birth in the previous 12 months

Will the information collected remain confidential?

Yes, all information collected about you during the course of the study will be kept confidential in line with the normal NHS and clinical research policies.

NHS Southampton University of

How do I find out more?

This is a very short summary about the study, if you would like to find out more you can contact a researcher via email (contact details below). Or by accessing the iSurvey webpage and reading a more detailed information sheet, this can be found at:

www.isurvey.soton.ac.uk/19563
password: baby

Thank you for reading this leaflet and for considering taking part in this study.

Contact Details

Hannah Tinton
B44A University of Southampton
University Road
Highfield
Southampton
Hampshire
SO17 1BJ

Email: ht5g14@soton.ac.uk

ERGO: 18715 IRAS: 199164 REC:16/SC/0370 V3 23.08.16

NHS Southampton University of

Pregnant? or New mum?

The University of Southampton Clinical Psychology department are looking for pregnant women and new mums to take part in a new research study.

Perinatal mental health

The perinatal period, defined in terms of mental health, spans from conception to one year post birth. It is thought that perinatal mental health difficulties occur in up to 10-20% of women. The most common difficulties are depression and anxiety.

Previous research has examined the possible external risk factors, such as recent life stressors or poor social support that may lead to the development of mental health problems. More recently research has begun to explore the personality factors which may influence the development of mental health difficulties during this time in women's lives.

What's the Research about?

This study is looking at the possible role that self-control may have within the development of mental health difficulties during the perinatal period. Research across the life span suggests that mental health difficulties are closely linked to self control.

It is hoped that by investigating self control in the perinatal period we can develop a clearer understanding of the personality traits that are more likely to result in mental health difficulties. This may increase the understanding of why certain people are more at risk and might enable better detection of those who could benefit from earlier intervention.

What does taking part involve?

This study is being conducted online. The researchers have a series of questionnaires that they would like you to answer. This will take approximately 30-45 minutes to complete. There will be no further participation required.

How can I take part?

If you would like to take part, please go to:

www.isurvey.soton.ac.uk/19563
password: baby

and complete the questionnaire.

We will be recruiting participants until March 2017.

Figure B3. *Poster used for advertisement.*

NHS

UNIVERSITY OF Southampton

Pregnant? or New mum?

The University of Southampton Clinical Psychology department are looking for pregnant women and new mums to take part in a new research study. This study will be examining the role of self control in the development of mental health difficulties during the perinatal period.

If you are 18 or over, and are currently pregnant, or have given birth within the last 12 months we would like to invite you to take part in our research study.

The study is being conducted online. The researchers have devised a series of questionnaires that will take approximately 30-45 minutes to complete.

You can find our more information and access the questionnaire at:
www.isurvey.soton.ac.uk/19563 password: baby

Interested in participating? We are recruiting until March 2017. For more information please email us!

Version 3 Date: 23/08/2016 ERGO: 18715 IRAS: 199164 REC: 16/SC/0370

Perinatal mental health study
www.isurvey.soton.ac.uk/19563
password: baby
For more info contact:
ht5e14@soton.ac.uk

Perinatal mental health study
www.isurvey.soton.ac.uk/19563
password: baby
For more info contact:
ht5e14@soton.ac.uk

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Perinatal mental health study
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password: baby
For more info contact:
ht5e14@soton.ac.uk

Appendix B

B2: Online survey

Link to iSurvey: https://www.isurvey.soton.ac.uk/19563

iSurvey Questionnaire

iSurvey Accessibility toolbar University of Southampton

The Role of Self Control in Perinatal Mental Health

Participant Information Sheet (V5 – 20/09/2016)

Study Title: The Role of Self Control in Perinatal Mental Health

Researcher: Hannah Tinton (Trainee Clinical Psychologist)

Ethics number: ERGO 18715, IRAS 199164

Please read this information carefully before deciding to take part in this research. If you are happy to participate you will be asked to complete a consent form.

We'd like to invite you to take part in our research study. Joining the study is entirely up to you, before you decide we would like you to understand why the research is being done and what it will involve for you. Please read through the information below to help you decide whether or not you would like to take part.

What is the research about?

This is a brief questionnaire study investigating how different levels of self-control and being a perfectionist are related to mood and well-being within a perinatal population. The term **'Perinatal'** means the period of time in a woman's life starting from conception up to one year after the birth of your child.

One of the reasons we are conducting this study is to better understand how certain personality traits may increase the risk for mental health problems in pregnant women or those who have given birth in the past year. Perinatal mental health problems occur in approximately 10-20% of women. The most common and investigated problems are depression and anxiety.

You do not need to be experiencing any of these problems yourself to take part. Equally, if you do experience symptoms such as feeling low, anxious or anything else, you can also take part. So, as long as you are pregnant and/or have given birth in the past year, you are eligible to take part in this study.

This study is being carried out by a Trainee Clinical Psychologist as part of her training towards a Doctorate in Clinical Psychology under the supervision of Dr Roelie Hempel (Senior Research Fellow) and Dr Hannah Wilson (Consultant Clinical Psychologist). We are looking to recruit a minimum of 210 women who are pregnant or who have given birth in the previous year. You are being invited to take part due to meeting one of those inclusion criteria.

What does taking part involve?

The research study is taking place online and at various NHS sites across Southern England in order to capture a wide variety of participants. The study will be recruiting participants until March 2017. If you choose to take part in this study you will be asked to complete a series of questionnaires, either via on an online forum, iSurvey, or in paper form at the clinic you attend (if you are currently accessing NHS services). It will take approximately 30-45 minutes to complete and once you have done so there will be no additional participation required. The series of questionnaires includes questions about you, your emotions, and your personality and coping styles. This is a standalone research study and will not impact upon any treatment you may currently be receiving.

What are the possible benefits of taking part?

Your participation in this study may not lead to any direct benefit to yourself. The most likely benefit of taking part will be contributing to the development of the understanding of the personality traits and coping styles which may lead to perinatal mental health difficulties. The information gathered may aid health care professionals in early identification of those at risk of mental health difficulties during the perinatal period.

What are the possible disadvantages and risks of taking part?

The nature of this research is not designed to cause discomfort or distress; however, the researchers are aware that taking part may cause some distress. Whilst completing the questionnaires you might notice a pattern in your answers which may lead to some concerns about your own mental health which you are currently unaware of, for example you may notice that you are scoring highly on questions about low mood or anxiety. As a research team we will not feedback your specific responses because all answers are stored anonymously, but we will provide information about support available to you should you be concerned about your mental health in a debrief information sheet upon completion of the questionnaire.

What happens if I change my mind?

The decision to take part in this study is entirely voluntary. You do not have to participate in this study and if you chose to, you can withdraw at any time. This will not affect your legal rights or routine care (should you currently be accessing NHS services). If you wish to withdraw from the study whilst completing the questionnaires please do not submit any data. Submission of your completed questionnaires will be considered to imply your consent to our using your anonymised data. If you have any queries about this before beginning the research please do not hesitate to contact the research team.

Will my participation be confidential?

All the information you provide us with will be treated confidentially. During the completion of the study you will not be asked for any information that could be used to identify you, your data will identified by a participant number only. Any information you provide us with will be stored anonymously.

The paper copies of the questionnaires and consent forms will be stored in locked filing cabinets in a secure University department. The electronic data from the questionnaires collected via iSurvey is done via Secure Sockets Layer (SSL) which encrypts the data before sending it and storing it in the database. A number of security checks are conducted prior to the research team accessing the data. This is in compliance with the Data Protection Act and University of Southampton policy.

The results of the study will be written up as part of a doctoral thesis. All results will be referred to anonymously. The full report will be available on the University of Southampton's thesis database. A summary of the findings will be distributed to the University of Southampton and the NHS sites research teams. On completion of the questionnaire you will be asked if you would like a summary of the results. If you decide to provide your email address to receive a summary of the findings this will be collected via a different survey and stored in a separate password protected file. The summary of the findings will then be sent on completion of the study. The findings from this study will also be submitted to peer reviewed journals to widen the academic communities understanding of perinatal mental health difficulties.

Who is organising and funding this study? Has it been reviewed?

This research study is being funded and sponsored by the University of Southampton.

All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by the NHS Research Ethics Committee, alongside the University of Southampton's Research Ethics Group.

What happens if something goes wrong?

If you have a concern about any aspect of this study, in the first instance please contact the researchers who will do their best to answer your questions Hannah Tinton (Trainee Clinical Psychologist) via email: ht5g14@soton.ac.uk.

If you remain unhappy and wish to complain formally, you can do this by contacting the Research Governance Manager at the University of Southampton (02380 595058, rgoinfo@soton.ac.uk).

If you have been recruited via an NHS setting please find a list of the complaints departments below and contact the appropriate department;

- NHS Patient Advice and Liaison Services (PALS) by telephone 02380 874065 or by email hp-tr.complaints@nhs.net.
- Southern Health Research and Development Department on 02380 874053.

Contact details of the researcher

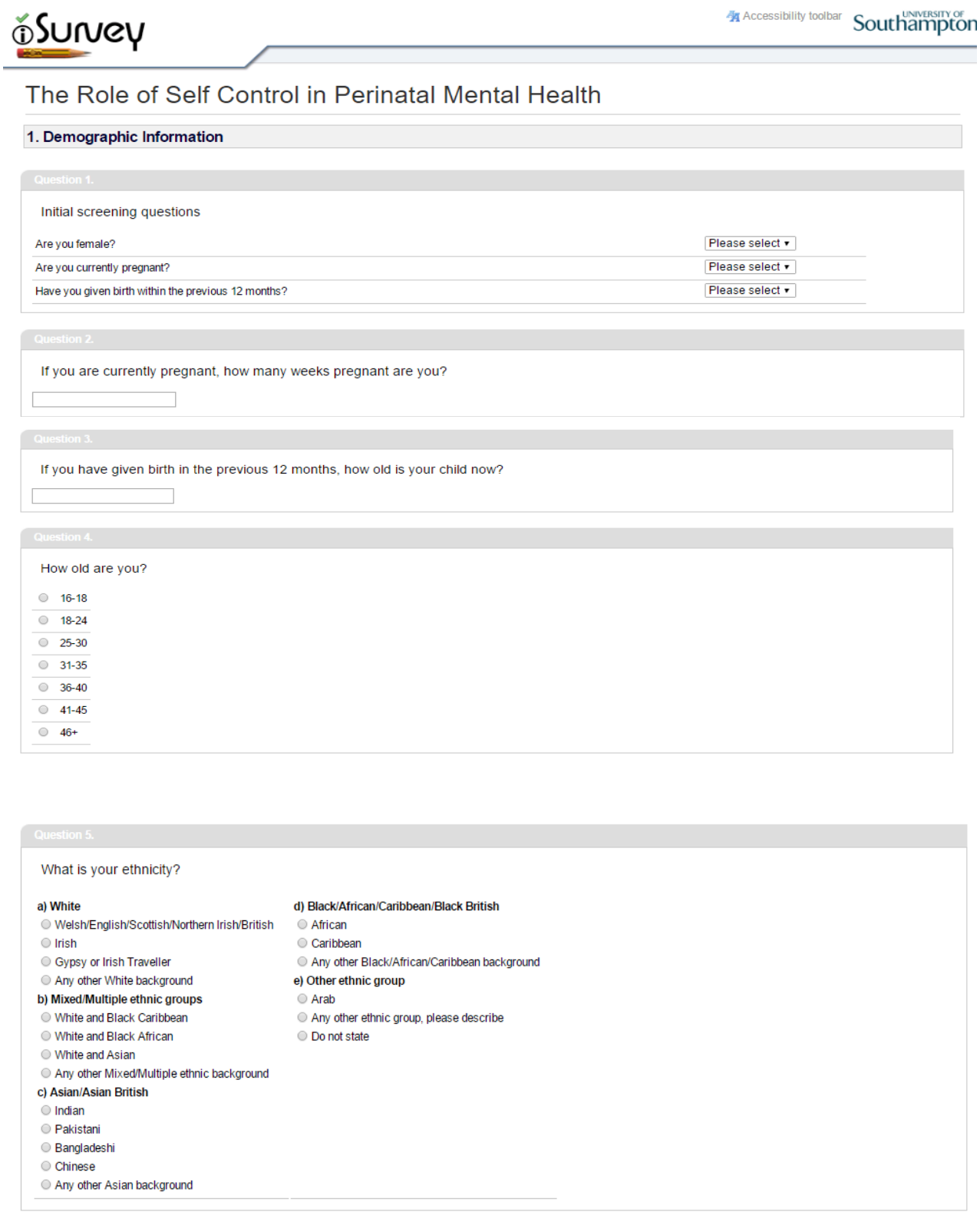
If you have any further questions or queries about this study please contact Hannah Tinton (Trainee Clinical Psychologist) via email: ht5g14@soton.ac.uk or Dr Roelie Hempel (Senior Research Fellow) r.hempel@soton.ac.uk.

A password is required to access this survey. Please enter password below

Please tick (check) this box to indicate that you consent to taking part in this survey

Click here to start this survey

Appendix B



iSurvey

Accessibility toolbar University of Southampton

The Role of Self Control in Perinatal Mental Health

1. Demographic Information

Question 1.

Initial screening questions

Are you female?	Please select
Are you currently pregnant?	Please select
Have you given birth within the previous 12 months?	Please select

Question 2.

If you are currently pregnant, how many weeks pregnant are you?

Question 3.

If you have given birth in the previous 12 months, how old is your child now?

Question 4.

How old are you?

- 16-18
- 18-24
- 25-30
- 31-35
- 36-40
- 41-45
- 46+

Question 5.

What is your ethnicity?

a) White
- Welsh/English/Scottish/Northern Irish/British
- Irish
- Gypsy or Irish Traveller
- Any other White background

b) Mixed/Multiple ethnic groups
- White and Black Caribbean
- White and Black African
- White and Asian
- Any other Mixed/Multiple ethnic background

c) Asian/Asian British
- Indian
- Pakistani
- Bangladeshi
- Chinese
- Any other Asian background

d) Black/African/Caribbean/Black British
- African
- Caribbean
- Any other Black/African/Caribbean background

e) Other ethnic group
- Arab
- Any other ethnic group, please describe
- Do not state

Question 6.

What is your first language?

Question 7.

What is the highest level of education you have completed?

Please select

Question 8.

What is your employment status?

Please select

Question 9.

What is your household annual income?

Please select

Question 10.

What is your marital status?

Please select

Who is the breadwinner in your household?

Please select

Question 12.

Do you already have children?

Yes

How many children do you have?

Question 13.

Have you ever had any mental health difficulties?

Yes

Yes, I have experienced...

- Depression
- Anxiety
- Post-natal depression
- Bi-polar affective disorder
- Psychosis
- Pueperal psychosis
- Personality disorder
- Other

Have you previously accessed mental health services?

Yes

Can you please give us some details of the mental health services you have previously accessed.

Appendix B

Do you currently have any mental health difficulties?

Yes

Current mental health difficulties

- [ ] Depression
- [ ] Anxiety
- [ ] Post-natal depression
- [ ] Bi-polar affective disorder
- [ ] Psychosis
- [ ] Pueperal psychosis
- [ ] Personality disorder
- [ ] Other

Are you currently accessing mental health services?

Yes

If you are accessing mental health services, can you please give us some details of the services you are currently accessing.

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The Role of Self Control in Perinatal Mental Health

2. Health Questionnaires

Question 1.

GAD-7 (Generalised Anxiety Disorder -7, Spitzer et al, 2006)

Over the last 2 weeks, how often have you been bothered by the following problems?

	Not at all	Several days	More than half the days	Nearly every day
Feeling nervous, anxious or on edge	○	○	○	○
Not being able to stop or control worrying	○	○	○	○
Worrying too much about different things	○	○	○	○
Trouble relaxing	○	○	○	○
Being so restless that it is hard to sit still	○	○	○	○
Becoming easily annoyed or irritable	○	○	○	○
Feeling afraid as if something awful might happen	○	○	○	○

Question 2.

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

- ○ Not difficult at all
- ○ Somewhat difficult
- ○ Very difficult
- ○ Extremely difficult

Question 3.

PHQ-9 (Patient Health Questionnaire, Spitzer, Kroenke & Williams, 1999)

Over the last 2 weeks, how often have you

been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly every day
Little interest or pleasure in doing things	○	○	○	○
Feeling down, depressed, or hopeless	○	○	○	○
Trouble falling or staying asleep, or sleeping too much	○	○	○	○
Feeling tired or having little energy	○	○	○	○
Poor appetite or overeating	○	○	○	○
Feeling bad about yourself — or that you are a failure or have let yourself or your family down	○	○	○	○
Trouble concentrating on things, such as reading the newspaper or watching television	○	○	○	○
Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving .around a lot more than usual	○	○	○	○
Thoughts that you would be better off dead or of hurting yourself in some way	○	○	○	○

Question 4.

PDSQ – (Psychiatric Disorder Screening Questionnaire, Zimmerman, 2000)

During the past two weeks....

	Yes	No
Did things happen that you knew were true, but that other people told you were your imagination?	○	○
Were you convinced that other people were watching you, talking about you, or spying on you?	○	○
Did you think that you were in danger because someone was plotting to hurt you?	○	○
Did you think that you had special powers other people don't have?	○	○
Did you think that some outside force or power was controlling your body or mind?	○	○
Did you hear voices that other people didn't hear, or see things that other people didn't see?	○	○

Question 5.

MDQ (Mood Disorder Questionnaire, Hirchfield et al, 2000)

Has there ever been a period of time when you were not your usual self and

	Yes	No
You felt so good or so hyper that other people thought you were not your normal self or you were so hyper that you got into trouble?	○	○
You were so irritable that you shouted at people or started fights or arguments?	○	○
You felt much more self-confident than usual?	○	○
You got much less sleep than usual and found you didn't really miss it?	○	○
You were much more talkative or spoke much faster than usual?	○	○
Thoughts raced through your head or you couldn't slow your mind down?	○	○
You were so easily distracted by things around you that you had trouble concentrating or staying on track?	○	○
You had much more energy than usual?	○	○
You were much more active or did many more things than usual?	○	○
You were much more social or outgoing than usual, for example, you		

You felt so good or so hyper that other people thought you were not your normal self or you were so hyper that you got into trouble?	○	○
You were so irritable that you shouted at people or started fights or arguments?	○	○
You felt much more self-confident than usual?	○	○
You got much less sleep than usual and found you didn't really miss it?	○	○
You were much more talkative or spoke much faster than usual?	○	○
Thoughts raced through your head or you couldn't slow your mind down?	○	○
You were so easily distracted by things around you that you had trouble concentrating or staying on track?	○	○
You had much more energy than usual?	○	○
You were much more active or did many more things than usual?	○	○
You were much more social or outgoing than usual, for example, you telephoned friends in the middle of the night?	○	○
You were much more interested in sex than usual?	○	○
You did things that were unusual for you or that other people might have thought were excessive, foolish, or risky?	○	○
Spending money got you or your family into trouble?	○	○

Question 6.

If you checked YES to more than one of the above, have several of these ever happened during the same period of time?

- ○ Yes
- ○ No

Question 7.

How much of a problem did any of these cause you – like being unable to work; having family, money or legal troubles; getting into arguments or fights?

- ○ No Problem
- ○ Minor Problem
- ○ Moderate Problem
- ○ Serious Problem

Question 8.

Have any of your blood relatives (i.e. children, siblings, parents, grandparents, aunts, uncles) had manic-depressive illness or bipolar disorder?

- ○ Yes
- ○ No

Question 9.

Has a health professional ever told you that you have manic-depressive illness or bipolar disorder?

- ○ Yes
- ○ No

Survey Progress

Start Finish

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1. Personality Questionnaires

Question 1.

The Over- and Under-control Trait Measure (OUT'M). Seretis, D., Hempel, R. J., Smith-Lynch, E., & Lynch, T.R. (in prep).

Read each word and use the scale provided below to rate the extent it describes you. If you are unsure how much a word is characteristic of you, imagine what your friends members might say about you.

	Not at all	Very slightly	A little	Moderately	Quite a bit	Very much	Extremely
Chaotic	○	○	○	○	○	○	○
Disciplined	○	○	○	○	○	○	○
Distant	○	○	○	○	○	○	○
Erratic	○	○	○	○	○	○	○
Exact	○	○	○	○	○	○	○
Extreme	○	○	○	○	○	○	○
Haphazard	○	○	○	○	○	○	○
Impulsive	○	○	○	○	○	○	○
Methodical	○	○	○	○	○	○	○

Distant	○	○	○	○	○	○	○
Erratic	○	○	○	○	○	○	○
Exact	○	○	○	○	○	○	○
Extreme	○	○	○	○	○	○	○
Haphazard	○	○	○	○	○	○	○
Impulsive	○	○	○	○	○	○	○
Methodical	○	○	○	○	○	○	○
Orderly	○	○	○	○	○	○	○
Organized	○	○	○	○	○	○	○
Precise	○	○	○	○	○	○	○
Quiet	○	○	○	○	○	○	○
Reckless	○	○	○	○	○	○	○
Reserved	○	○	○	○	○	○	○
Risky	○	○	○	○	○	○	○
Shy	○	○	○	○	○	○	○
Structured	○	○	○	○	○	○	○
Wild	○	○	○	○	○	○	○
Withdrawn	○	○	○	○	○	○	○

Appendix B

Question 2.

PAI-BOR (Personality Assessment Inventory – Borderline Features Scale, Morey, 1991)

Read each statement and decide if it is an accurate statement about you. Mark your answer by circling the appropriate choice. Give your own opinion of yourself. Be sure to answer every statement.

	False	Slightly True	Mainly True	Very True
My mood can shift quite suddenly.	○	○	○	○
My attitude about myself changes a lot.	○	○	○	○
My relationships have been stormy.	○	○	○	○
My moods get quite intense.	○	○	○	○
Sometimes I feel terribly empty inside.	○	○	○	○
I want to let certain people know how much they've hurt me.	○	○	○	○
My mood is very steady.	○	○	○	○
I worry a lot about other people leaving me.	○	○	○	○
People once close to me have let me down.	○	○	○	○
I have little control over my anger.	○	○	○	○
I often wonder what I should do with my life.	○	○	○	○
I rarely feel very lonely.	○	○	○	○
I sometimes do things so impulsively that I get into trouble.	○	○	○	○
I've always been a pretty happy person.	○	○	○	○
I can't handle separation from those close to me very well.	○	○	○	○
I've made some real mistakes in the people I've picked as friends.	○	○	○	○
When I'm upset, I typically do something to hurt myself.	○	○	○	○
I've had times when I was so mad I couldn't do enough to express all my anger.	○	○	○	○
I don't get bored very easily.	○	○	○	○
Once someone is my friend, we stay friends.	○	○	○	○
I'm too impulsive for my own good.	○	○	○	○
I spend money too easily	○	○	○	○
I'm a reckless person.	○	○	○	○
I'm careful about how I spend my money.	○	○	○	○

Question 3.

FMPS (Frost Multidimentional Perfectionism Scale, Frost et al, 1990)

Read each statement carefully. For each statement, fill in the response that best represents your opinion. Make sure that your answer corresponds to the response that is most true for you.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My parents set very high standards for me.	○	○	○	○	○
Organization is very important to me.	○	○	○	○	○
As a child, I was punished for doing things less than perfect.	○	○	○	○	○
If I do not set the highest standards for myself, I am likely to end up a second-rate person	○	○	○	○	○
My parents never tried to understand my mistakes.	○	○	○	○	○
It is important to me that I be thoroughly competent in everything I do.	○	○	○	○	○
I am a neat person.	○	○	○	○	○
I try to be an organized person.	○	○	○	○	○
If I fail at work/school, I am a failure as a person.	○	○	○	○	○
I should be upset if I make a mistake.	○	○	○	○	○
My parents wanted me to be the best at everything.	○	○	○	○	○
I set higher goals than most people.	○	○	○	○	○
If someone does a task at work/school better than I, then I feel like I failed the whole task.	○	○	○	○	○
If I fail partly, it is as bad as being a complete failure.	○	○	○	○	○
Only outstanding performance is good enough in my family.	○	○	○	○	○
I am very good at focusing my efforts on attaining a goal.	○	○	○	○	○
Even when I do something very carefully, I often feel that it is not quite right.	○	○	○	○	○

I hate being less than the best at things.	○	○	○	○	○
I have extremely high goals.	○	○	○	○	○
My parents have expected excellence from me.	○	○	○	○	○
People will probably think less of me if I make a mistake.	○	○	○	○	○
I never felt like I could meet my parents' expectations.	○	○	○	○	○
If I do not do as well as other people, it means I am an inferior human being.	○	○	○	○	○
Other people seem to accept lower standards from themselves than I do.	○	○	○	○	○
If I do not do well all the time, people will not respect me.	○	○	○	○	○
My parents have always had higher expectations for my future than I have.	○	○	○	○	○
I try to be a neat person.	○	○	○	○	○
I usually have doubts about the simple everyday things I do.	○	○	○	○	○
Neatness is very important to me.	○	○	○	○	○
I expect higher performance in my daily tasks than most people.	○	○	○	○	○
I am an organized person.	○	○	○	○	○
I tend to get behind in my work because I repeat things over and over.	○	○	○	○	○
It takes me a long time to do something "right."	○	○	○	○	○
The fewer mistakes I make, the more people will like me.	○	○	○	○	○
I never felt like I could meet my parents' standards.	○	○	○	○	○

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The Role of Self Control in Perinatal Mental Health

Debriefing Statement *(written,* 12/08/2016, Version 2)

Study Title: The Role of Self Control in Perinatal Mental Health

Researcher: Hannah Tinton (Trainee Clinical Psychologist)

Ethics number: ERGO 18715, IRAS 199164

Thank you for participating in this study. We appreciate the time you devoted to participating in this study. The aim of this study is to test the role of self-control within the perinatal population to develop a clearer understanding of the personality traits that are more likely to result in mental health difficulties. We hope that this study will help us to identify people earlier if they need support during the perinatal period of their pregnancy.

Should you have any concerns about your own wellbeing after completing our questionnaires, we hope you find the information below helpful.

- Please refer to the following pages on NHS choices for more information http://www.nhs.uk/conditions/pregnancy-and-baby/pages/mental-health-problems-pregnant.aspx
- If you would like to access some support for the difficulties outlined above the following services will accept self referrals;
- iTalk (for participants based in Hampshire) http://www.italk.org.uk/ Tel: 02380 8038 3920 or info@italk.org.uk
- Steps to Wellbeing (for participants based in Southampton or Dorset) http://www.steps2wellbeing.co.uk/ Tel: 0800 612 7000
- Alternatively please visit your GP. They can advise your treatment options.

The following websites are useful for further information and charitable support;

http://www.pandasfoundation.org.uk/

https://www.family-action.org.uk/what-we-do/early-years/perinatal-support-services/

http://www.wellspringcharityfoundation.org.uk/ante--post-natal-depression-support.html

Appendix B

If you require urgent support:

Contact your GP. If your GP surgery is not open, you can contact the NHS Out of Hours Medical Service on 111. NHS 111 is available 24 hours a day, 365 days a year. Calls are free from landlines and mobile phones.

If you feel at risk of harming yourself or others – go straight to your nearest Accident and Emergency department or contact the Samaritans on 116 123.

The Samaritans' phone lines are open 24 hours a day, 7 days a week, the number is free to call. You can also e mail the Samaritans jo@samaritans.org. For more information visit their website at http://www.samaritans.org/

Once again thank you for your participation. If you have requested to be informed of the outcome of the study we will send you a summary of the findings upon completion in October 2017.

If you have any further questions please contact Hannah Tinton (Trainee Clinical Psychologist) via email: ht5q14@soton.ac.uk, or the research supervisor Dr Roelie Hempel (Senior Research Fellow) via email: r.hempel@soton.ac.uk

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: +44 (0)23 8059 3856, email fshs-rso@soton.ac.uk

B3: Ethical approval

University of Southampton Research Ethics Committee

The role of self control in perinatal mental health

Submission ID:18715

Submission Overview | IRGA Form | Attachments | History | Adverse Incident

Amendment History

Latest Version

Original Submission

Current Status

Approved

Category A Research.

Click here for more information on research categories

Submission Checklist

IRGA Form	Complete
Ethics Form	Attached
Risk Form	Attached

Comments

Updated IRGA, IRAS and SOA.

Co-ordinators

Roelie Hempel

Hannah Tinton

The role of self control in perinatal mental health (Amendment 1)

Submission ID:24925

Submission Overview | IRGA Form | Attachments | History | Adverse Incident

Amendment History

Latest Version

Original Submission

Current Status

Approved

Category A Research.

Click here for more information on research categories

This study ended on 31st March 2017

To apply for an extension for this study please click this link

If anything else is changing in your reseach other than the study dates please use the 'Amend and resubmit' option below

Submission Checklist

IRGA Form	Complete
Ethics Form	Attached
Risk Form	Attached

Comments

Amendments have been made to the ethics form and proposal updating the participating NHS Trusts amending two previous Trusts and using the updated Trust information (Hampshire Hospitals), no newly identified trust have been added to the project. HRA amendment email attached as the documentation sent to the HRA, no further information was sent to the HRA prior to categorisation.

Co-ordinators

Roelie Hempel

Hannah Tinton

Appendix B

NHS – Health Research Authority Approval

NHS
Health Research Authority

Miss Hannah Florence Tinton
[redacted]
Email: hra.approval@nhs.net

21 September 2016

Dear Miss Tinton

Letter of HRA Approval

Study title:	**Examining the role of self control in the development of perinatal mental health difficulties.**
IRAS project ID:	**199164**
Protocol number:	**1**
REC reference:	**16/SC/0370**
Sponsor	**University of Southampton**

I am pleased to confirm that HRA Approval has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications noted in this letter.

Participation of NHS Organisations in England

The sponsor should now provide a copy of this letter to all participating NHS organisations in England.

Appendix B provides important information for sponsors and participating NHS organisations in England for arranging and confirming capacity and capability. **Please read *Appendix B* carefully**, in particular the following sections:

- *Participating NHS organisations in England* – this clarifies the types of participating organisations in the study and whether or not all organisations will be undertaking the same activities
- *Confirmation of capacity and capability* - this confirms whether or not each type of participating NHS organisation in England is expected to give formal confirmation of capacity and capability. Where formal confirmation is not expected, the section also provides details on the time limit given to participating organisations to opt out of the study, or request additional time, before their participation is assumed.
- *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* - this provides detail on the form of agreement to be used in the study to confirm capacity and capability, where applicable.

Further information on funding, HR processes, and compliance with HRA criteria and standards is also provided.

IRAS project ID	199164

It is critical that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details and further information about working with the research management function for each organisation can be accessed from www.hra.nhs.uk/hra-approval.

Appendices

The HRA Approval letter contains the following appendices:

- A – List of documents reviewed during HRA assessment
- B – Summary of HRA assessment

After HRA Approval

The document *"After Ethical Review – guidance for sponsors and investigators"*, issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments
- Notifying the end of the study

The HRA website also provides guidance on these topics, and is updated in the light of changes in reporting expectations or procedures.

In addition to the guidance in the above, please note the following:

- HRA Approval applies for the duration of your REC favourable opinion, unless otherwise notified in writing by the HRA.
- Substantial amendments should be submitted directly to the Research Ethics Committee, as detailed in the *After Ethical Review* document. Non-substantial amendments should be submitted for review by the HRA using the form provided on the HRA website, and emailed to hra.amendments@nhs.net.
- The HRA will categorise amendments (substantial and non-substantial) and issue confirmation of continued HRA Approval. Further details can be found on the HRA website.

Scope

HRA Approval provides an approval for research involving patients or staff in NHS organisations in England.

If your study involves NHS organisations in other countries in the UK, please contact the relevant national coordinating functions for support and advice. Further information can be found at http://www.hra.nhs.uk/resources/applying-for-reviews/nhs-hsc-rd-review/.

If there are participating non-NHS organisations, local agreement should be obtained in accordance with the procedures of the local participating non-NHS organisation.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application

IRAS project ID	199164

procedure. If you wish to make your views known please email the HRA at hra.approval@nhs.net. Additionally, one of our staff would be happy to call and discuss your experience of HRA Approval.

HRA Training

We are pleased to welcome researchers and research management staff at our training days – see details at http://www.hra.nhs.uk/hra-training/

Your IRAS project ID is **199164**. Please quote this on all correspondence.

Yours sincerely

[redacted]

Assessor

Email: hra.approval@nhs.net

B4: Reliability analysis

Table B2. *Internal consistency statistics for variables using Cronbach's alpha (N= 253).*

Variable	Subscale	Items (*N*)	α
PHQ-9	Total score	9	.89
GAD-7	Total score	7	.90
MDQ	Total score	13	.84
PDSQ	Total score	6	.66
PAI-BOR	Total score	24	.74
OUT'M	Total score	20	.82
	Inhibition	8	.89
	Detachment	5	.86
	Need for structure	7	.93
FMPS	Total score	35	.95
	Concern for mistakes	9	.94
	Parental expectations	5	.83
	Parental criticism	4	.85
	Doubts about actions	4	.84
	Personal standards	7	.88
	Organisation	6	.89
	Maladaptive Evaluative Concerns	22	.94

B5: Supplementary analyses tables

Table B3. *Correlational relationships between the clinical variables and the personality variables.*

Variable	GAD- 7	PHQ-9	MDQ	PAI	PDSQ
PHQ-9	.77***	-	-	-	-
MDQ	.09	.15*	-	-	-
PAI	.15*	.15*	.59***	-	-
PDSQ	.05	.09	.37***	.36***	-
OUTM - Sum	.004	-.08	-.14*	-.16***	-.15*
OUTM-Inhibition	-.09	-.18**	-.50***	-.56***	-.36***
OUTM-Detachment	.15*	.09	.29***	-.35***	.19***
OUTM-Need for Structure	-.007	-.04	-.01	-.04	-.06
FMPS - Sum	.07	.09	.31***	.34***	.09
FMPS – Concern over mistakes	.06	.07	.34***	.40***	.13*
FMPS – Parental Expectations	.08	.08	.13*	.13*	.04
FMPS – Parental Criticism	.03	.08	.21**	.29***	.04
FMPS – Doubts Of Actions	.07	.11	.43***	.47***	.23***
FMPS – Personal standards	.03	.07	.109	.04	-.08
FMPS - Organisation	-.04	-.08	.001	.09	-.02
FMPS – Maladaptive Evaluative Concerns	.07	.10	.36***	.41***	-.14*

Note *= $p<0.05$, ** = $p<0.01$ ***= $p<0.001$

Table B4. *Correlational relationships between the clinical variables and the personality variables.*

Variable	OUTM - Sum	OUTM- Inhibition	OUTM- Detachment	OUTM- Need for Structure
FMPS - Sum	.17***	-.34***	.30***	.30***
FMPS – Concern over mistakes	.12	-.40***	.34***	.24***
FMPS – Parental Expectations	.04	-.19***	.09	.15*
FMPS – Parental Criticism	.04	-.22***	.25***	.06
FMPS – Doubts of Actions	.07	-.38***	.37***	.14*
FMPS – Personal standards	.29***	-.13*	.12*	.43***
FMPS - Organisation	.46***	.11	.06	.52***
FMPS - Maladaptive Evaluative Concerns	.09	-.39***	.34***	.21***

Note *= $p<0.05$, ** = $p<0.01$ ***= $p<0.00$

Appendix B

List of References

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