The Role of Epistemic Trust in the Treatment of Major Depressive Disorder

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Thesis declaration form

I confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signature: 

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Overview

This thesis focuses on feelings of emotional isolation and disconnectedness from others and examines their relationship with psychopathology through the exploration of two constructs that are theorised to be conceptually linked through social cognition; loneliness and epistemic trust. Both chronic loneliness and low levels of epistemic trust have been hypothesized to impair social cognition. Collectively, this impacts upon an individual's ability to form satisfying emotional attachments. If one desires connections with others but cannot achieve them, this leads to loneliness. If an individual cannot trust socially communicated information, they may feel misunderstood by others and suspicious of their intentions and knowledge, leaving them feeling intensely alone.

The literature review (Part 1) is a meta-analysis of loneliness in individuals with mental disorders and/or personality disorders compared to healthy controls. The review contains meta-analyses for all disorders, mental disorders and personality disorders.

The empirical research paper (Part 2) examines the association between epistemic trust (in others and in therapists) and therapist's contingent responding (expected and perceived) and overall depressive symptom severity and the rate of change of depressive symptoms over therapy sessions. This project was a sub-study of a larger project on depression involving a number of measures that were not included in the analyses of this research.

The critical appraisal (Part 3) details a number of practical and methodological challenges encountered during the research and my reflections on these. It outlines my experiences working with individuals with depression and my reflections on conducting research in a field with limited existing empirical evidence.

Impact Statement

The findings of this study can stimulate improvements in the field of mental health, both academically and clinically.

Academia

The present study is the first to investigate the role openness to social learning plays in the process of therapy. The findings of this study begin to build an evidence base for the theory of epistemic trust and it's link to psychopathology. These tentative findings may stimulate interest in researching this theory further, which could build upon the limitations and scope of this project. This could lead to improved ways of measuring and conceptualising epistemic trust and a richer understanding of its exact role in mental health treatment.

The findings of both the literature review and empirical paper are suggestive of possible transdiagnostic factors in mental disorders which illuminate the need for further research into ways of conceptualising and understanding mental distress that deviate from current psychiatric classification models. Moreover, their findings suggest that social connectedness and social communication may play a key role in both generating and addressing mental distress and so recognising their link in more detail could enhance the understanding of the developmental course of psychopathology. The findings of the review and the preliminary observations of the empirical study highlight the need for more research on both the constructs of loneliness and epistemic trust.

The limitations of the findings emphasise the need to conduct research on large sample sizes with validated measures to take advantage of the usefulness of using multilevel models to understand the complex relationship between a number of variables.

Clinical Practice

As low epistemic trust in others appears to be associated with a slower rate of depressive symptom decline in therapy, it may be important to assess openness to

social learning during psychological assessment in order to adapt therapy accordingly. As improvements are slower in those with lower trust, these individuals may need a greater focus on the therapeutic relationship between client and therapist and on relationships with others. Consequently, this may require a longer course of therapy in order to benefit from it to the same degree as somebody with high trust. These findings emphasise the importance of relationships in a client's life and the need to build a sound bond between client and therapist in order for the client to benefit from therapy. Improving the effectiveness of therapies for depression could help to minimise the economical and social impact it has in the UK.

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Part 1: Literature Review

Loneliness in Psychopathology: A Meta-Analysis

1.1 Abstract

Aims: To assess whether individuals with a mental disorder or personality disorder experience more subjective loneliness than healthy controls.

Methods: PsycINFO, EMBASE, MEDLINE and Web of Science were searched using terms related to mental disorders, personality disorders and loneliness. The search yielded 452 papers, for which twenty-two met the review criteria, with nineteen being used in the meta-analysis due to missing data. As a number of these studies included more than one "patient" participant group, thirty effect sizes were included in the overall meta-analysis.

Results: An overall significant large positive effect of mental disorder/personality disorder on loneliness (d=1.15) was found. Due to significant heterogeneity between the studies, post-hoc analyses were conducted to explore this. No significant effect of loneliness measurement type or study quality was found. A significant effect of disorder category (personality disorder, mood disorder, anxiety disorder, psychosis, eating disorder or mixed mental disorder) was found. A further meta-analysis excluding studies of personality disorders found a lower, but significant large positive effect of mental disorder on loneliness (d=1.03) with no heterogeneity between studies. A meta-analysis looking only at personality disorder found a higher overall significant large positive effect on loneliness (d=2.23).

Conclusions: This review found evidence that individuals with mental disorders and/or personality disorders are lonelier than those without any psychopathology. The results suggest that this relationship is stronger for personality disorders. However, it is difficult to draw conclusions due to various limitations, including a lack of studies exploring certain disorders and unrepresentative samples.

1.2 Introduction

Loneliness is a subjective emotional experience characterised by a painful sense of isolation that is discordant with an individual's desired level of connectedness with others (Wang et al., 2017). Evolutionary psychologists argue that humans are social creatures with a basic need to belong in order to survive (Cacioppo & Cacioppo, 2018). Thus, loneliness serves as a stark emotional trigger that tells the individual they need to connect more with others (Cacioppo et al., 2018).

Theories of the construct of loneliness fall into two main categories; unidimensional theories and multidimensional theories (McWhirter, 1990). Unidimensional theories view loneliness as a unitary construct that is experienced in the same manner across individuals, although with varying intensities (McWhirter, 1990). Conversely, multidimensional theories characterise loneliness as having sub-types (McWhirter, 1990), with common distinctions including social versus emotional loneliness (Weiss, 1973). Social loneliness is a result of social isolation, and therefore an increase in social contact is likely to reduce this (Weiss, 1973). Conversely, emotional loneliness is the absence of a sufficiently close emotional attachment with another and thus would only reduce if relationships of a certain emotional quality increased (Weiss, 1973). Other theories include separate types of loneliness for romantic relationships, peer relationships and familial relationships (Schmidt & Sermat, 1983).

As a result of these different theories of loneliness, a number of different measurements of loneliness have been created and used in research. Many studies have focussed on measuring objective elements of social experiences, such as social contact, social support or social network size (Wang et al., 2017). However, these factors do not take into account an individual's desired level of sociability. Thus, they fail to measure the emotional element of the individual's social world – namely emotional attachment and closeness, which are not in complete concordance with social isolation (Wang et al., 2017).

A number of self-report measurements of loneliness have been constructed in an attempt to quantify the level of discrepancy an individual feels in their desired versus actual connectedness with others (Russell, 1982). Unidimensional measurements of loneliness generally use positively and negatively worded statements, avoid the direct mention of “loneliness”, and ask individuals to rate the applicability of these statements to themselves on a Likert scale (Russell, 1982). A number of these measurements were found to have good reliability and validity (see Table 1 for details). It is also common for loneliness to be measured in large-scale surveys directly asking, “are you lonely?” (Russell, 1982). However, single-construct self-report measurements can only be tested for test-retest reliability and responses can be influenced by social desirability (Russell, 1982). Multidimensional measurements of loneliness generally use the same format of items and Likert scales as unidimensional ones, however, they score items according to the presumed subscales of loneliness that they correspond to (Russell, 1982). Many of these also offer an overall loneliness score (Russell, 1982). These have been found to have good reliability and validity (see Table 1 for details).

Table 1

Self-report loneliness measures, their characteristics, reliability and validity.

Loneliness Measure	Items	Response Format	Structure	Reliability	Validity
Bradley Loneliness Scale [a]	38	6-point Likert scale	Unidimensional	Split- half .95 α .90 [g] Test-retest 2 weeks r=.89, 8 weeks r=.83 [b]	"emotionally disturbed" prisoners vs control prisoners [b] Self-labelling Question r= .45 to r=.80 [b]
Abbreviated Loneliness Scale [c]	7	4-point Likert scale	Unidimensional	Test-retest 1 week r=.85 α .67 [c]	Self-labelling Question r=.61 [c]
UCLA Loneliness Scale [d]	20	"often", "sometimes", "rarely", "never".	Unidimensional	α .93 Test- retest 2 months r=.73 [d]	Self-labelling Question r=.79 [d]
3 Item Loneliness Scale [e]	3	"hardly ever", "some of the time", "often"	Unidimensional	α .72 [e]	Correlation with UCLA-R r=.82 [e]
Differential Loneliness Scale [f]	60	True-false	Multidimensional	Kuder-Richardson 20s – .9 and .92 [f]	Factor Analysis: family, romantic and friendship [f]
Belcher Extended Loneliness Scale [b]	60	6-point Likert scale	Multidimensional	Test-retest 9 weeks r=.79, 11 weeks r=.84 [b] α .93 [g]	Students seeking counselling vs student controls Self-labelling Question r=.59 [a]
Loneliness Rating Scale [h]	40	4 and 5 point scale	Multidimensional	α .82 to .89 [h]	None reported
De Jong Gierveld Scale [i]	38	6-point Likert scale	Multidimensional	α r=.64 to r=.87 [c]	Self and other rated loneliness r=.49 and r=.40[i]
Social and Emotional Loneliness Scale [j]	37	7-point Likert scale	Multidimensional	α .89 to .93 [j]	Correlations with UCLA-R r=.37 to r=.79 [j]

[a] Bradley (1969); [b] Belcher (1973); [c] Ellison and Paloutzian (1973); [d] Russell (1978);[e] Hughes, Waite, Hawkley and Cacioppo (2004); [f] Schmidt (1976); [g] Solano (1980); [h] Scalise, Ginter and Gerstein (1984); [i] De Jong Gierveld (1978); [i] DiTomasso and Spinner (1993)

A recent population study in Germany found a 10.5% prevalence rate for loneliness (Beutel et al., 2017). A prevalence study in the UK found that 11% of adults *often* felt lonely and 34% *sometimes* felt lonely (Griffin, 2010). Loneliness can vary with age and tends to peak during late adolescence, then decreases throughout middle adulthood and peaks again during late adulthood (Luhmann & Hawkley, 2016). Loneliness is associated with a number of mental health symptomatology, including depressive symptoms (Erzen & Cikrika, 2018), suicidality (Heus, Stravynski & Boyer, 2001), psychological stress (Cacioppo, Hughes, Waite, Hawkley & Thisted, 2006), anxiety symptoms (Cacioppo et al., 2006), psychotic symptoms (Michalska, Rhodes, Vasilopoulou & Hutton, 2017) and poor sleep (Matthews et al., 2017). Loneliness is also associated with negative personality traits such as high neuroticism, low agreeableness, low conscientiousness and introversion (Schermer & Martin, 2019). It has also been associated with borderline personality disorder (BPD) (Richman & Sokolove, 1992). Additionally, loneliness has also been found to be associated with a number of adverse physical health outcomes, such as lower immune system functioning (Pressman et al., 2005), poorer cardiovascular functioning (Caspi, Harrington, Moffitt, Milne & Poulton, 2006) and strokes (Valtorta, Kanaan, Gilbody, Ronzi & Hanratty 2016). Long term health conditions such as these tend to also be associated with mental health symptomatology themselves, such as depressive symptoms (Patten et al., 2005).

Given that loneliness has been found to be associated with a variety of psychiatric symptomatology and adverse personality traits, it is likely that individuals experiencing a mental disorder or personality disorder are more likely to experience loneliness than individuals without such conditions. Consequently, since loneliness has been associated with a number of physical health problems, which in turn are associated with poorer mental wellbeing, individuals with existing mental disorders or personality disorders may be at a higher risk of developing further physical and emotional difficulties if they are also lonely. Understanding loneliness in those with

emotional difficulties may highlight a key common factor in the experience of mental disorders that can inform our understanding and treatment of them. A number of transdiagnostic factors have been associated with mental disorders, such as internalising and externalising cognitions and behaviours, suggesting that there are conceptual links between distinct psychiatric diagnoses (Krueger & Eaton, 2015). If higher levels of loneliness are present across personality and mental disorders, it may indicate that the construct is a transdiagnostic symptom of psychopathology for which a transdiagnostic approach to treatment may be required.

To date, there have been few literature reviews on loneliness in individuals with mental disorders and/or personality disorders. Lim, Gleeson, Alvarez-Jimenez and Penn (2018) systematically reviewed studies examining the impact of loneliness as a dependent, moderating or mediating variable on individuals with a diagnosis of psychotic disorder. The review found mixed evidence of the relationship between loneliness and psychotic symptoms, but found that any relationship between the two constructs could be partly explained by other psychosocial variables including anxiety, living alone, a sense of being stigmatised, community participation, and low self-esteem. Da Rocha, Rhodes, Vasilopoulou and Hutton (2017) conducted a meta-analysis on thirteen studies looking at the association between psychotic symptoms and loneliness and found an overall moderate positive association using a random effects model. Levine (2012) conducted a systematic review on literature that examines the relationship between psychosocial variables that are associated with loneliness and eating disorders. They found that many of these variables (such as experiences of childhood abuse, interpersonal difficulties and insecure attachment) were also associated with eating disorders. Furthermore, Wang, Mann, Lloyd-Evans, Ma and Johnson (2018) conducted a systematic review on the impact of loneliness and perceived social support on the longitudinal outcomes of mental disorders. This review found that these constructs initially appeared to predict poorer outcomes for depression, schizophrenia, bipolar disorder and anxiety disorders. However, most of

the studies included in the review measured perceived social support rather than loneliness. Erzen et al. (2018) conducted a meta-analysis on studies that examined the relationship between loneliness and depression and found a moderate positive relationship between loneliness and depression.

Studies investigating loneliness in mental disorders or personality disorders often do not compare loneliness to healthy controls and so it is difficult to ascertain whether those with mental disorders or personality disorders experience loneliness more frequently or more intensely than those without these conditions. If emotional loneliness is an experience common to mental disorders and personality disorders, whilst also present to a greater extent than in the general population, this could have important implications for treatment of these conditions. No existing reviews have examined the prevalence of, or experience of loneliness in those with mental and/or personality disorders compared to healthy controls. Given the lack of existing reviews examining the differences between these two groups and the wide ranging negative impact loneliness can have on physical and psychosocial outcomes, this review begins to identify whether loneliness has a relationship with all or some psychopathology which could provide useful insights when understanding and therefore treating such difficulties.

1.2.1 Research Aims

The present meta-analysis and systematic review aims to assess whether individuals with a mental disorder or personality disorder experience more subjective loneliness than healthy controls. It also aims to examine the quality and breadth of the literature on subjective loneliness in mental disorders and personality disorders compared to healthy controls.

To ensure that subjective loneliness was being investigated, as opposed to social support or social contact (as frequently used in literature to measure or infer loneliness), only studies that used valid and reliable self-report measures of the subjective emotional experience of loneliness were used. This did not include one

item measures of loneliness that are often used in large scale surveys due to the limited ability to ascertain reliability and validity. There are also difficulties with potential social desirability effects and participants defining the construct of loneliness in different ways. As much of the research tends to distinguish between mental disorders and personality disorders, likely due to the distinction of the these two types of psychopathologies in the previous edition of the diagnostic statistical manual; DSM-IV (American Psychiatric Association, 2000), the same distinction has been made throughout this review, despite the same distinctions not being made in the current edition of the manual.

1.3 Method

The current systematic review and meta-analysis adheres to the PRISMA guidelines (Moher, Tetzlaff & Altman, 2009). In line with these guidelines, the review protocol is reported below, including search strategy, eligibility criteria and method of synthesising the findings of the studies included in the review.

1.3.1 Data sources and inclusion criteria

Four databases were searched: PsycINFO, EMBASE, MEDLINE and Web of Science. Due to discrepancies in the literature about the definition of loneliness, and it's confusion with related concepts such as social isolation or social support, it was decided that only the names of reliable and validated measures of subjective loneliness would be used in the search terms instead of the phrase "loneliness" to minimise the number of studies returned that did not measure subjective loneliness sufficiently or at all. In order to ensure that studies on a variety of mental/personality disorders were captured in the search, general terms of mental/personality disorders were used. Additionally, specific terms for a variety of the most common affective, anxiety, psychotic and personality disorders were used. These were guided by subject heading searches in PsycINFO, EMBASE and MEDLINE (Web of Science does not

have a subject heading search function). The date parameters of the search were 1806 to week seven of 2019.

The search terms were:

"Abbreviated Loneliness Scale" OR "UCLA loneliness scale" OR "Revised UCLA Loneliness scale" OR "UCLA-LS" OR "R-UCLA" OR "ULS-20" OR "ULS-8" OR "ULS-4" OR "social and emotional loneliness scale" OR "SELSA" OR "SELSA-S" OR "de jong gierveld loneliness scale" OR "differential loneliness scale" OR "Bradley Loneliness Scale" OR "Belcher Extended Loneliness Scale" OR "BELS" OR "loneliness Rating Scale" OR "LRS" OR "three item loneliness scale" OR "TILS"

AND

"mental disorder" OR "mental illness*" OR "psychiatric disorder*" OR "personality disorder*" OR "bipolar disorder" OR "major depress*" OR "schizoaffective disorder" OR "generali*ed anxiety disorder" OR "obsessive compulsive disorder" OR "panic disorder" OR "post traumatic stress disorder" OR "social phobia" OR "agoraphobia" OR "anorexia nervosa" OR "bulimia nervosa" OR "psychosis" OR "schizophrenia" OR "eating disorder*" OR "anxiety disorder*" OR "affective disorder*" OR "borderline personality disorder" OR "BPD" OR "emotionally unstable personality disorder" OR "EUPD" OR "narcissistic personality disorder" OR "paranoid personality disorder" OR "antisocial personality disorder" OR "avoidant personality disorder" OR "dependent personality disorder" OR "histrionic personality disorder" OR "schizoid personality disorder" OR "schizotypal personality disorder" OR "obsessive compulsive personality disorder"*

Once duplicates were removed, the 452 titles and abstracts resulting from this search were read and studies were selected for further examination based on the following inclusion criteria:

1) It was a full study published in a peer reviewed journal
2) It was published in English
3) Loneliness was measured using a reliable and valid self-report measure
4) The study included a healthy control group and mental disorder/personality disorder group in which loneliness scores are compared or available
5) Diagnosis of mental disorders were made by clinicians (either during or before the study) or using a reliable and valid measure used to determine mental disorder symptoms of clinical significance
6) Participants were working age adults aged over 16 years (can include older adults in the sample, but not exclusively an older adult population)
7) It was an original study (e.g. not a review)

Full texts of the abstracts that met the above criteria were obtained and reviewed according to the same criteria. The reference lists of the final studies were then surveyed for any article titles that appeared to meet the above criteria, for which the abstract was then reviewed against the same criteria. Web of Science was used to conduct a citation search of all articles sourced. Titles were reviewed and abstracts sourced and evaluated according to the same criteria. Full texts of any abstracts that met the above criteria were examined again. The number of studies sourced and excluded at each stage of the search is shown in Figure 1.

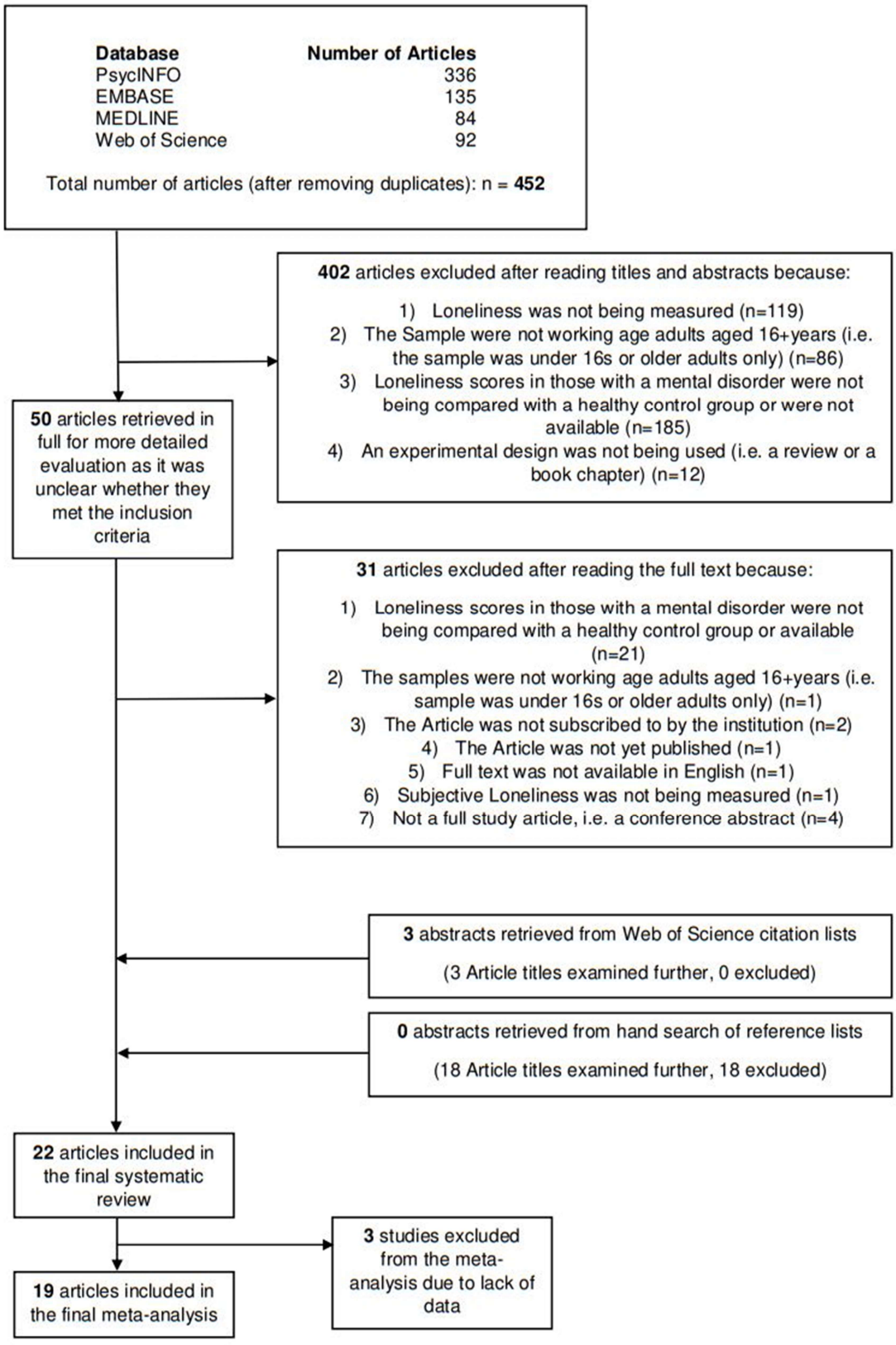

Figure 1

PRISMA Diagram of Literature search strategy

1.3.2 Study Quality

Study quality was assessed using the Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields (Kmet, Lee & Cook, 2004). The tool has criteria for studies that collect qualitative and quantitative data. The fourteen item measure for studies that collect quantitative data was used. The measure has three items which pertain to interventional studies, which were excluded from the score calculation in this review, as instructed in the manual. The maximum score on this measure is 1. Where it was unclear whether the study met certain criteria (due to lack of clarity or missing information), the authors were contacted. Four authors were contacted and two responded, with one of these authors unable to provide the data requested. Where clarification or further information could not be obtained, it was assumed that the studies did not meet the particular criterion in question.

1.3.3 Loneliness Measures

Studies included in the review mostly used unidimensional measures of loneliness with some using multidimensional measures (see Table 2 for details). The papers reported the mean loneliness scores from each participant group for comparison.

Table 2

The characteristics of the loneliness measures used in the studies

Loneliness Measure	Conceptualisation of Loneliness	Items and Scoring	Study
UCLA Loneliness Scale [a]	Unidimensional	20 items "often", "sometimes", "rarely", "never". 20 (low loneliness) to 80 (high loneliness)	Franko et al. (2005) Hsu, Hailey and Range (1987) Liebke et al. (2016) Thome et al. (2016)
Revised UCLA Loneliness Scale [b]	Unidimensional	20 items "often", "sometimes", "rarely", "never". 20 (low loneliness) to 80 (high loneliness)	Balkir, Arens and Barnow (2012) Brown (1996) Hauschild et al. (2018) Johnson, Rabkin, Williams, Ramien and Gorman (2000) Murphy (2000) Levi et al. (2008) Levi-Belz et al. (2014) Tremeau, Antonius, Malaspina, Goff and Javitt (2016) Timpano, Rubenstein Murphy and Schmidt (2014)
UCLA Loneliness Scale (version 3) [c]	Unidimensional	20 items 4-point Likert scale; 1 (never) to 4 (often) 20 (low loneliness) to 80 (high loneliness)	Eglit, Palmer, Martin, Tu and Jeste (2018) Harney, Fitzsimmons-Crafr, Maldonado and Bardone-Cone (2014) Michael and Park (2016) Neeleman and Power (1994)
UCLA Loneliness Scale (short form) [d]	Unidimensional	8 items 4-point Likert scale; 1 (never) to 4 (always)	Wiseman, Guttfreund and Lurie (1995)

		8 (low loneliness) to 32 (high loneliness)	
Belcher Extended Loneliness Scale [e]	Multidimensional (psychological, alienation and anomie)	60 items 6point Likert scale Higher scores indicate higher loneliness	Hsu et al. (1987)
De Jong Gierveld Loneliness Scale [f]	Multidimensional (overall, emotional and social)	11 items 6-point Likert scale Subscales for emotional and social loneliness "strongly agree", "agree", "disagree", "strongly disagree" 0 (not lonely) to 11 (extremely lonely)	Chrostek, Grygiel, Anczewska, Wciorka and Switaj (2016) Saris, Aghajani, van der Werff, van der Wee and Penninx (2017)
De Jong Gierveld Loneliness Scale – Short version [g]	Multidimensional (overall, emotional and social)	6 items Subscales for emotional and social loneliness "yes!", "yes", "more or less", "no", "no!" 0-3 per subscale, 0-6 total, higher scores indicate higher loneliness	Diehl, Jansen, Ishchanova and Hilger-Kolb (2018)
Social Emotional Loneliness Scale [h]	Multidimensional (emotional and social)	10 items Subscales for emotional and social loneliness 5-point Likert scale;1 (Never) to 7 (Very often) 5 – 25 higher scores indicate higher loneliness	Hayley et al. (2017)

[a] Russell (1978); [b] Russell, Peplau and Cutrona (1980); [c] Russell (1996); [d] Hays and DiMatteo (1987); [e] Belcher (1973); [f] De Jong Gierveld and Kamphuis (1985); [g] De Jong Gierveld and Van Tilburg (2006); [h] Wittenberg (1987

1.3.4 Effect Size Calculation

Standardised effect sizes of the differences in the mean loneliness scores of mental and personality disorder participant groups and healthy controls in each paper were computed into Cohen's *d* (Cohen, 1977). Some papers included these already

and some were calculated by existing data in the paper, or from data gathered by contacting the authors.

Effect size (d) = $(M_{MD/PD} - M_{Control})/SD_{pooled}$

$M_{MD/PD}$ is the mean loneliness score the mental disorder/personality disorder participant group and $M_{Control}$ is the mean loneliness score for the healthy control group. SD_{pooled} is the standard deviations for both the mental disorder/personality disorder participant group and the healthy control group calculated using this equation:

$SD_{pooled} = \sqrt{((SD_1^2 + SD_2^2)/2)}$

In accordance with Cohen (1977) effect sizes are interpreted as having the following categories: 0.2 is small, 0.5 is medium and 0.8 is large. A negative effect size indicates that healthy controls reported higher levels of loneliness, and a positive effect size represents a higher level of reported loneliness from the mental disorder/personality disorder participant group. None of the studies reviewed reported a negative effect size.

The estimated standard error for Cohen's d was also calculated, using the following equation:

$SE\ (d) = \sqrt{([n_{MD/PD} + n_{Control}]/[n_{MD/PD} \times n_{Control}]) + (d \times 2/[2x(n_{MD/PD} + N_{Control} - 2])}$

$n_{MD/PD}$ and $n_{Control}$ represent the sample size for the mental disorder/personality disorder and healthy control participant groups respectively.

1.3.5 Statistical Procedures

As recommended in the literature, a random effects model was used to conduct the meta-analysis, which accounts for the variability at study level and subject level (Field & Gillett, 2010). The analysis was conducted on SPSS using a custom syntax created by Field et al. (2010) for calculating a standardised difference between two means using a random effects model. The homogeneity of effects was analysed using the Q statistic (Field et al., 2010).

Three papers that are discussed more broadly in the narrative synthesis were not included in the meta-analysis due to insufficient data to compute effect size or to compare effect sizes; Michael et al. (2016), Hsu et al. (1987) and Wiseman et al. (1995). The authors of these papers were contacted to obtain this data; one responded but was unable to provide the data required, the others did not respond.

A number of the studies compared more than one mental disorder/personality disorder group to a group of healthy controls; Balkir et al.(2012), Brown (1996), Diehl et al. (2018), Franko et al. (2005), Johnson et al. (2000), Hayley et al. (2017), Levi-Belz et al. (2014), Levi et al. (2008) and Saris et al. (2017). The effect sizes for each of these comparisons were included in the meta-analysis individually as although the healthy control groups were the same within the studies, the mental disorder/personality disorder groups differed.

1.4 Results

1.4.1 Corpus of Studies

The literature search yielded twenty two studies that fulfilled the inclusion criteria (see Table 3). One study measured both social and emotional loneliness separately using the Social Emotional Loneliness Scale (Wittenberg, 1987). Only the scores for emotional loneliness were used as social loneliness is defined as not having enough social contact and does not measure the emotional experiences of the individual. The effect sizes and confidence intervals of the difference in means of the

patient groups and healthy control groups for each study, as well as the overall mean effect size and confidence intervals can be seen in Figure 2.

Although the effect sizes of three of the studies could be not be obtained, all the studies reported a significant positive effect of having a mental disorder on loneliness. Two of these studies included a group with depression and one included a group with schizophrenia. Thirty effect sizes were obtained from the nineteen studies in the meta-analysis. Twenty-three effect sizes were large, six medium and one small. One study showed no effect of having a mental disorder on loneliness. Effect sizes tended to be highest for studies that included participants groups with a personality disorder, BPD and individuals with a mental disorder who had also recently engaged in a medically serious suicide attempt. One study (Brown, 1996) found that males with a severe mental disorder were lonelier than females with a severe mental disorder. One study (Balkir et al., 2012) found that German individuals with depression were lonelier that Turkish individuals with depression in comparison to their German and Turkish healthy control comparison groups. One study (Saris et al., 2017) found that individuals with comorbid depression and anxiety were lonelier than those with only depression or only anxiety compared to healthy controls. One study (Franko et al., 2005) found that black participants with a mental disorder were lonelier than white participants with a mental disorder in comparison to their respective healthy control groups. One study (Diehl et al., 2018) found that individuals with severe depression and anxiety were lonelier than those with moderate depression and anxiety compared to a healthy control group.

Table 3

Participant groups, age, gender distribution, measurement of loneliness, method of diagnosis and source of sample for the studies

Study	Participant Groups (n)	Mean Age (years)/SD (Range)	Male:Female Ratio	Loneliness Measure	Method of diagnosis	Source of sample
Balkir,et al. (2012)	Turkish with MDD (29) German with MDD (27) Turkish healthy controls (28) German healthy controls (26)	43.3/1.91 (-) 44.5/1.84 (-) 43.6/1.87 (-) 43.9/1.95 (-)	0:29 0:27 0:28 0:26	R-UCLA	DSM-IV	P: Inpatient wards of three hospitals C: newspaper advertisements, community flyers
Brown (1996)	Severe mental illness (191) Healthy controls (978)	- (-) - (-)	105:86 494:484	R-UCLA	Pre-existing diagnosis and history of structured care.	P: - C: standardised sample of UCLA Loneliness Scale
Chrostek et al. (2016)	Psychosis (207) Healthy controls (978)	38.3/12.6 (-) - (18-79)	104:103 -	DJGLS	Pre-existing diagnosis	Pt: inpatient ward, day ward, a psychiatric outpatient unit C: national survey
Diehl et al. (2018)	Severe depression and anxiety (26) Moderate depression and anxiety (58) Healthy controls (379)	- (16+) - (16+) - (16+)	- - -	DJGLS-SV	PHQ4	Online survey of students from multiple Universities
Eglit et al. (2018)	Schizophrenia/schizoaffective disorder (116) Healthy controls (106)	50.77/10.44 (-) 51.49/11.40 (-)	62:54 47:59	UCLA LS (Version 3)	SCID-I	P: local outpatient clinics, residential care C Local flyers, adverts, word of mouth
Franko et al. (2005)	White non-depressed (389) Black non-depressed (441)	- (21-23) - (21-23)	- -	UCLA LS	CES-D	National survey

	White moderate depression (246) Black moderate depression (213)	- (21-23) - (21-23)	- -			
Harney et al. (2014)	Eating disorders (53) Healthy controls (67)	- (16-40) - (16-40)	0:53 0:67	UCLA LS (Version 3)	SCID-I	P: Specialist eating disorder clinic C: clinic and university campus
Hauschild et al. (2018)	BPD (26) Healthy controls (25)	30.7/9.6 (-) 28.2/5.9 (-)	0:26 0:26	R-UCLA	IPDE	Existing research database
Hayley et al. (2017)	Clinical anxiety (3648) Sub-clinical anxiety symptoms (9877) Clinical depression (4573) Sub-clinical depressive symptoms (8952)	- (<35) - (<35) - (<35) - (<35)	- - - -	SELSA	HSCL	National survey for students in higher education
Hsu et al. (1987)	Depression (21) Chinese healthy controls in America (131) American healthy controls (44) Chinese healthy controls in Taiwan (41)	- (-) 27.56 (-) 22.09 (-) 21.21 (-)	3:18 80:51 11:33 11:23	UCLA LS	Pre-existing diagnosis	P: University outpatient clinic C: undergraduate students
Johnson et al. (2000)	Axis I disorders (36) Axis II disorders (26) Healthy controls (112)	- (23-60) - (23-60) - (23-60)	26:0 112:0 -	R-UCLA	SCID-I, SCID-II	Advertisements in newsletters/newspapers with predominantly gay readership

Levi-Belz et al. (2014)	Mental disorder (with medically serious suicide attempt) (78) Mental disorder (with medically non-serious suicide attempt) (116) Mental disorder (47) Healthy controls (95)	38.5/14.2 (20-85) 38.5/13.9 (20-85) 40.9/14 (20-85) 38.5/14.2 (20-85)	44:34 65:51 14:33 52:43	R-UCLA	SCID-I	General and psychiatric medical centres
Levi et al. (2008)	Mental disorder (with medically serious suicide attempt) (35) Mental disorder (with medically non-serious suicide attempt) (67) Healthy controls (71)	39.7/15.3 (-) 37.3/14 (-) 36.5/14 (-)	18:17 31:36 37:34	R-UCLA	SCID-I	Medical Centre
Liebke et al. (2016)	BPD (40) Healthy controls (40)	27.1 -) 27 (-)	0:40 0:40	UCLA LS	IPDE	Existing research database and advertising, on online BPD groups and newspaper adverts
Michael et al. (2016)	Schizophrenia (25) Healthy controls (15)	44.4 (-) 44.93 (-)	14:11 10:5	UCLA LS (Version 3)	Pre-existing diagnosis	P: one outpatient clinic C: Advertisement in locality of the outpatient clinic
Murphy (2000)	Forensic psychiatric inpatients (30) Healthy controls (25)	37 (-) 33 (-)	24:6 27:4	R-UCLA	Pre-existing diagnosis	P:5 medium secure inpatient psychiatric unit C: orthopaedic wards
Neeleman et al. (1944)	Schizophrenia (21) Healthy controls (25)	45/12.6 (-) 35/10.6 (-)	10:11 23:2	UCLA LS (Version 3)	Pre-existing diagnosis	Psychiatric outpatient clinic

Saris et al. (2017)	Anxiety (540) Depression (393) Depression and anxiety (748)	41.8/12.8 (-) 41//12.2 (-) 41.3/12 (-)	176:364 138:255 239:509	DJGLS	CIDI	Community care, primary care and specialist mental health services across three regions
Thome et al. (2016)	BPD (36) Healthy controls (36)	26.6/5.4 (-) 26.8/5.2 (-)	0:36 0:36	UCLA	IPDE	Existing research database and advertising, on online BPD groups and newspaper adverts
Timpano et al. (2014)	Clinical OCD symptoms (40) Non-clinical OCD symptoms (325)	- (18-33) - (18-33)	- -	R- UCLA	OCI	Undergraduate sample
Tremeau et al. (2016)	Schizophrenia/schizoaffective disorder (87) Healthy controls (58)	39.6/10.95 (18-65) 38.31/14 (18-65)	62:25 18:40	R-UCLA	SCID-I	P: an inpatient and outpatient clinic C: Advertisements
Wiseman et al. (1995)	Depression (-) Healthy Controls (-)	- -	- -	UCLA-LS (short form)	BDI	University counselling service

Note. Some information not available in the published papers or from the authors; P = patient group, C= control group; R-UCLA = Revised UCLA Loneliness Scale, SELSA=Social and Emotional Loneliness Scale, DJGLS = De Jong Gierveld Loneliness Scale, UCLA-LS = UCLA Loneliness Scale; PHQ4= Patient Health Questionnaire-4, SCID-I=Structured Clinical Interview for Axis I Disorders in DSM-IV, SCID-II – Structured Clinical Interview for Axis II Disorders in DSM-IV, CES-D = The Centre for Epidemiologic Studies Depression Scale, IPDE= International Personality Disorder Examination, HSCL= Hopkins Symptoms Checklist, CIDI= The DSM-IV Composite Interview Diagnostic Instrument, OCI= Obsessive Compulsive Inventory, BDI=Beck Depression Inventory.

1.4.2 Disorders Investigated

The loneliness scores of a number of different mental disorders and personality disorders were investigated across the studies (see Table 4 for a summary). However, due to the low number of studies some disorders were only investigated by a single study or a small number of studies. Many common mental disorders were not investigated at all. Additionally, a number of studies grouped multiple mental disorders together into one participant group.

Table 4

Number of studies examining various disorder categories

Disorder	Number of Studies
Depression	6 [a]
OCD	1
Psychosis/Schizophrenia/Schizoaffective Disorder	4 [b]
Borderline Personality Disorder	3
Eating Disorders	1
Anxiety Disorders (any)	2
Personality Disorder (any)	1
Varied mental disorders	7

[a] Two studies excluded from meta-analysis; [b] One study excluded from meta-analysis

1.4.3 Study Quality

Table 5 notes the quality scores for each study according to the Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields (Kmet,et al., 2004). The mean score was .84 (SD=.10) out of 1, suggesting

that overall the studies were of good quality. Some quality problems identified in the studies were small sample sizes, unrepresentative sample sizes (such as only using participants of one gender), limited estimates of variance (such as lack of confidence intervals), possible sampling biases, lack of data (such as not reporting means and standard deviations of groups compared in analyses) and possible problems with confounding variables. An independent rater used the same quality assessment tool to rate a random sample of five papers. The joint probability of agreement (Uebersax, 1987) on all items for these five papers was 82.85%.

Table 5

Quality assessment scores for all studies

Study	KMET score (out of 1)
Balkir, et al. (2012)	.82
Brown (1996)	.73
Chrostek et al. (2016)	.91
Diehl et al. (2018)	.77
Eglit et al. (2018)	.91
Franko et al. (2005)	.86
Harney et al. (2014)	.95
Hauschild et al. (2018)	.77
Hayley et al. (2017)	1.00
Hsu et al. (1987)	.64
Johnson et al. (2000)	.91
Levi-Belz et al. (2014)	.86
Levi et al. (2008)	.82
Liebke et al. (2016)	.91
Michael et al. (2016)	.82
Murphy (2000)	.64
Neeleman et al. (1994)	.91
Saris et al. (2017)	.91
Thome et al. (2016)	.86
Timpano et al. (2014)	.86
Tremeau et al. (2016)	.95
Wiseman, et al. (1995)	.73

1.4.4 Meta-Analysis Results

Figure 2 shows a forest plot of the effect sizes for loneliness scores between mental disorder/personality disorder and healthy controls, showing an overall

significant positive effect of mental disorder/personality disorder of 1.15 (95% confidence interval [CI] = 0.99-1.31). This denotes a large effect size (Cohen, 1977). No studies found that healthy controls were lonelier than participants with mental disorders/personality disorders. One study found no effect of mental disorder on loneliness. The population effect size is significant (z=13.98, p<.001).

Heterogeneity between the studies was significant (Q=53.82, df=29, p=.003). This suggests that the variability across effect sizes is greater than would be expected solely from sampling error or accounted for by the variability in study level and sample level that is computed in the random effects model. Field et al.'s (2010) SPSS syntax for moderator analysis was used post-hoc to explore whether measurement type (unidimensional loneliness measure vs. multidimensional loneliness measure), disorder category (personality disorder, mood disorder, anxiety disorder, psychosis, eating disorder or mixed mental disorder) or study quality could explain this heterogeneity. There was no evidence that effect size differed according to measurement type (X^2=0.004, df=1, p=.95) or study quality (β=-0.66, df=21, p=.63). There was evidence of effect size differing according to disorder category (X^2 = 21.28, df=5, p=.001).

As effect sizes for individuals with personality disorders were the largest of all the effect sizes, the meta-analysis was run again removing these effect sizes from the analysis. Although the overall effect size reduced, it still demonstrated a large positive effect of mental disorders on loneliness (d=1.03, 95% confidence interval [CI] = 0.869-1.19) and the heterogeneity of the studies was no longer significant (Q=31.43, df=25, p=.175). This suggests that the heterogeneity was due to the inclusion of effect sizes from both personality disorder and mental disorder groups. A meta-analysis was conducted on the four studies that examined personality disorders only and found a significant large positive effect of personality disorders on loneliness (d=2.23, 95% confidence intervals [CI] = 1.33-3.12) with no evidence of heterogeneity of the studies (Q=2.25, df=3, p=.522). This was a larger effect than found in the studies of mental

disorders. Separate forest plots of the effect sizes for loneliness scores between mental disorder/personality disorder and healthy controls are presented separately in Figures 3 and 4.

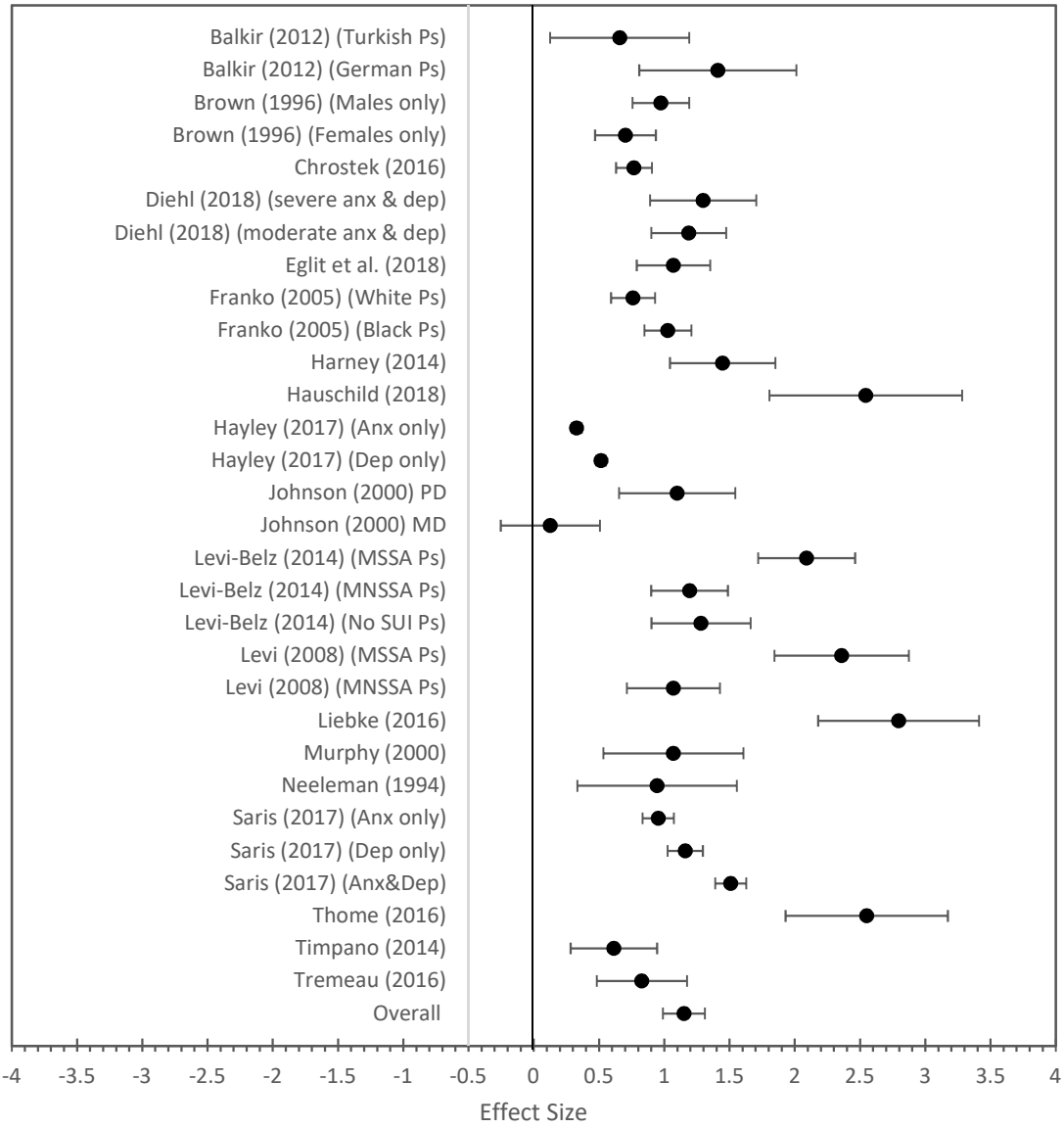

Figure 2

Loneliness effect sizes and confidence intervals for all studies included in the overall meta-analysis

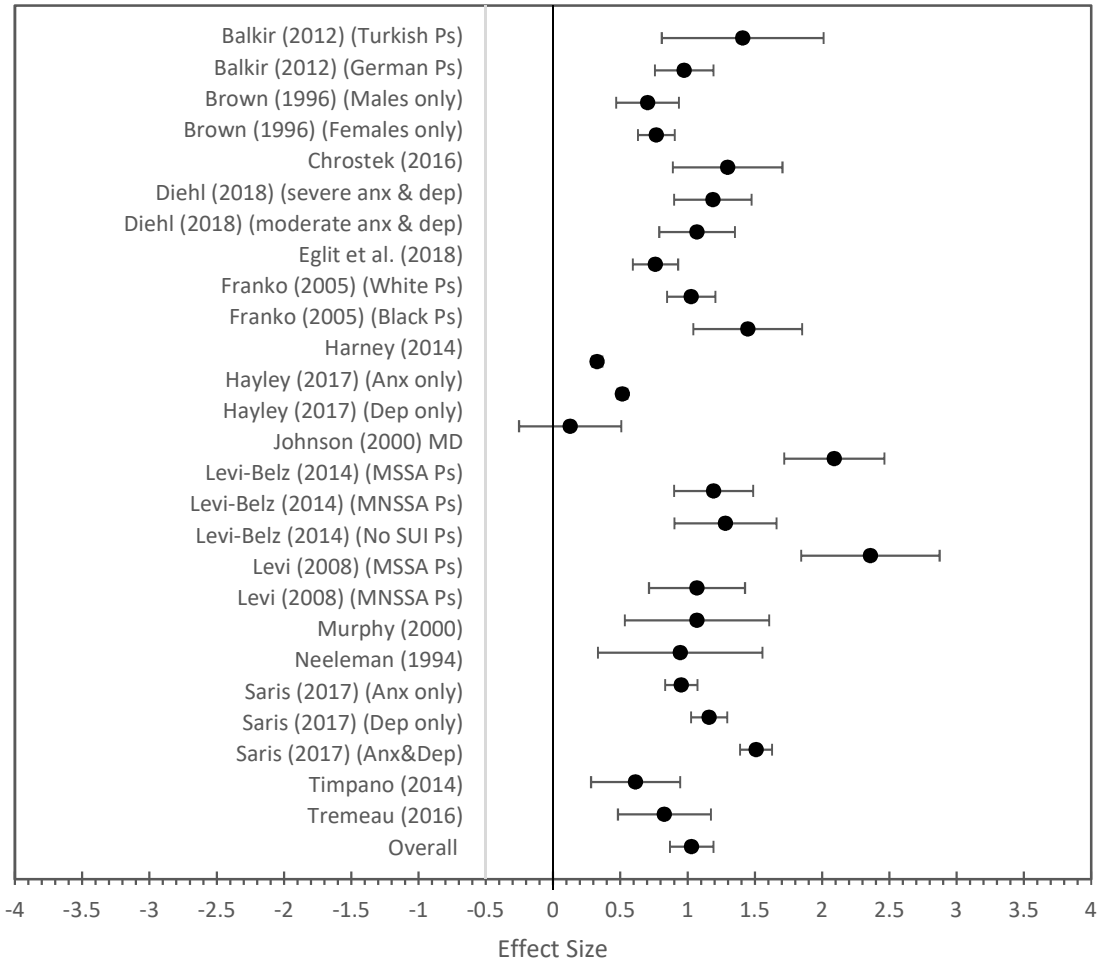

Figure 3

Loneliness effect sizes and confidence intervals for studies examining mental disorders only

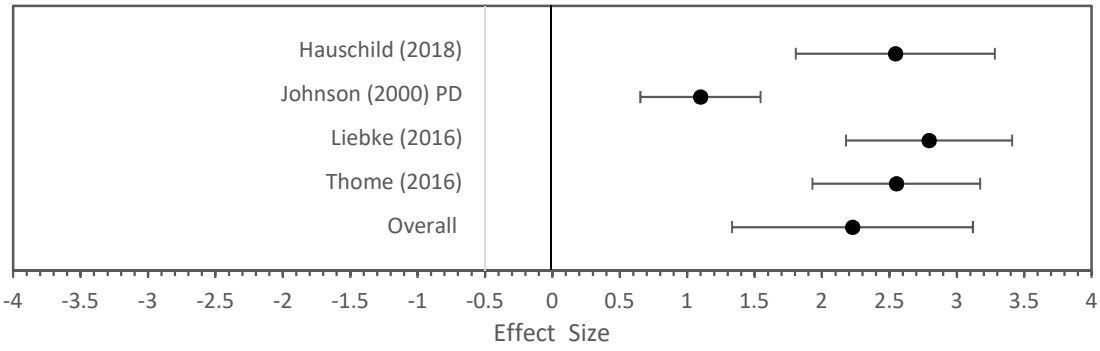

Figure 4

Loneliness effect sizes and confidence intervals for studies examining personality disorders

1.4.5 Publication Bias

Rosenthal's (1979) fail safe N was also computed for the overall meta-analysis and suggested that 32029 unpublished studies would need to exist for the population effect size estimate to be non-significant. Publication bias is visually represented in a funnel plot (see Figure 5). This funnel plot shows effect sizes clustered at the bottom of the plot, mostly to the left hand side, with a number of effect sizes far extended to the right hand side beyond the upper limit of the 95% confidence interval.

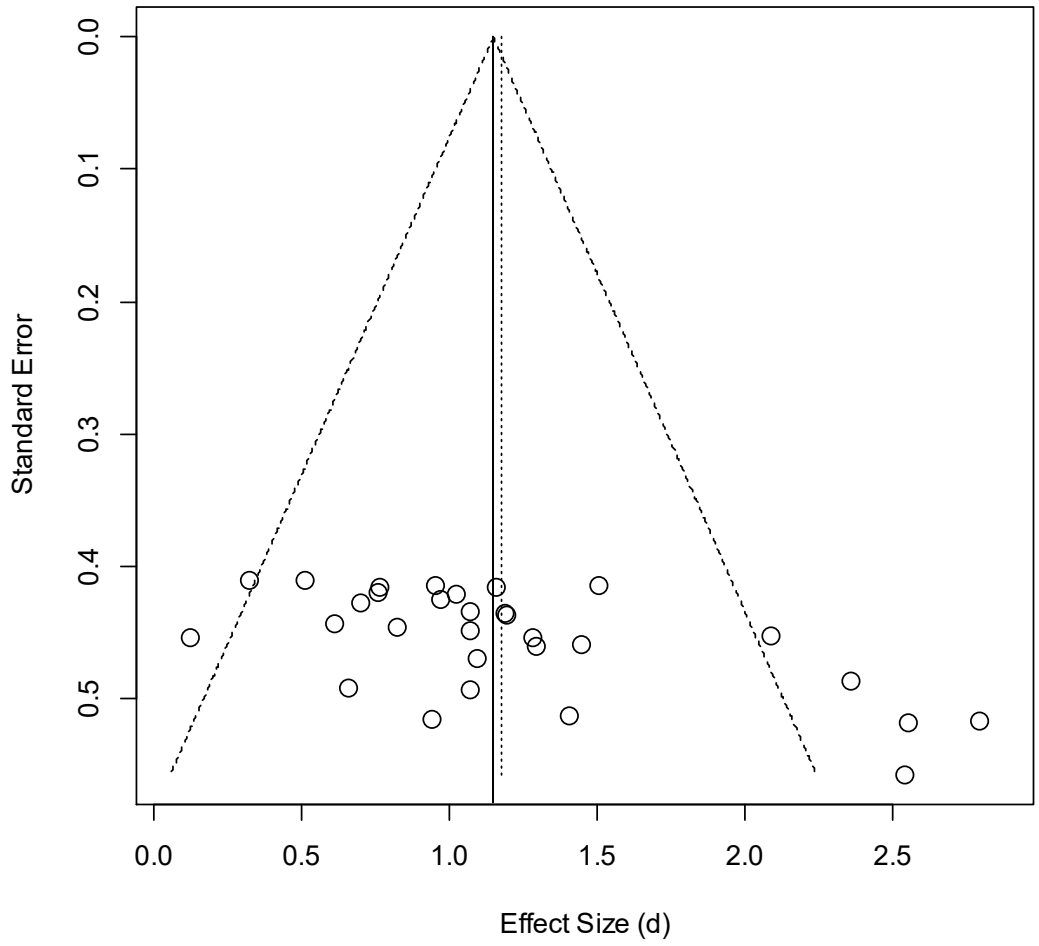

Figure 5

A funnel plot exploring publication bias, including all studies in the overall meta-analysis

Publication bias is indicated when the effect sizes tend to cluster at the lower part of the funnel, particularly toward the right hand side of the plot, as this indicates an overrepresentation of larger effect sizes with larger standard errors, which are likely due to small sample sizes (Sterne et al., 2011). This could be a result of a reporting bias – a tendency to report studies with large effect sizes and methodological flaws, such as small sample size, which could result in exaggeration of the true effect size (Sterne et al., 2011). If there is heterogeneity between the studies then this can cause the funnel plot to be largely symmetrical, with additional

horizontal scatter (Sterne et al., 2011). The homogeneity test showed heterogeneity of the studies, which could explain the relatively symmetrical distribution on the funnel plot despite the small number of effect sizes that extend to the lower right-hand side. Kendall's method of rank correlation for publication bias (Begg & Mazumdar, 1994) suggested some possible publication bias (z=0.39, p=.002).

Vevea and Wood's (2005) scripts for adjusted estimates of effect size based on the potential impact of moderate and severe publication bias for studies with one and two tailed hypotheses were used in R Studio. The calculated estimates of severe impacts of both one tailed and two tailed publication bias suggest the overall effect size could have been affected. However, all estimates still indicate a large effect size (see Table 6).

Table 6

The overall effect size adjusted for publication bias estimates for the overall meta-analysis

Type of Effect Size Estimate	Effect Size Estimate
Unadjusted estimate	1.15
Moderate one tailed selection bias	1.13
Severe one tailed selection bias	1.08
Moderate two tailed selection bias	1.16
Severe two tailed selection bias	1.44

Rosenthal's (1979) fail safe N was also computed for the mental disorder meta-analysis and suggested that 24398 unpublished studies would need to exist for the population effect size estimate to be non-significant. Publication bias is visually represented in a funnel plot (see Figure 6). This funnel plot shows effect sizes clustered at the bottom of the plot, mostly to the left-hand side, with two effect sizes

far extended to the right-hand side beyond the upper limit of the 95% confidence interval. In general, there are less effect sizes extended to the lower right-hand size of the funnel plot for this meta-analysis. However, the studies still continued to be clustered at the bottom of the plot, suggesting some overrepresentation of studies with larger effect sizes and larger standard errors, indicating a possible reporting bias. However, Kendall's method of rank correlation for publication bias (Begg et al., 1994) did not indicate possible publication bias (*z*=0.25, p=.074).

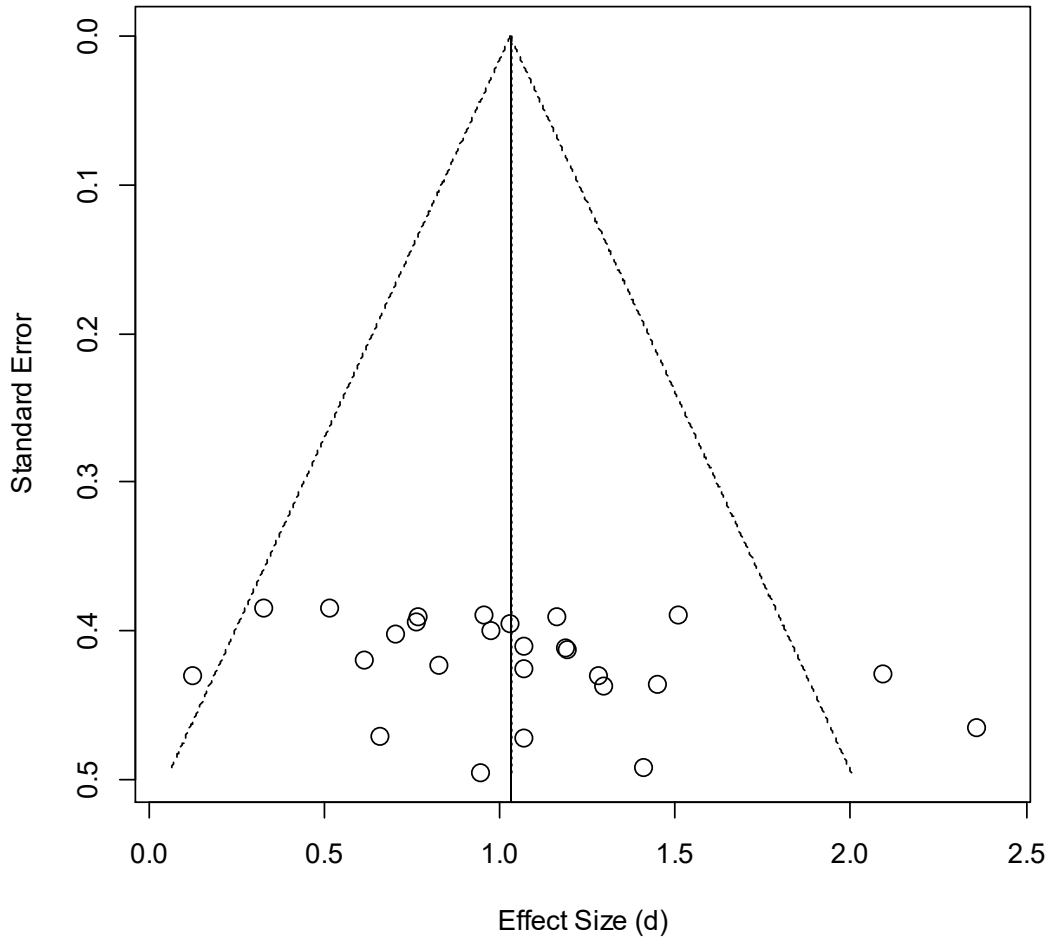

Figure 6

A funnel plot exploring publication bias, including only studies that included individuals with mental disorders

Vevea et al.'s (2005) scripts for adjusted estimates of effect size based on the potential impact of moderate and severe publication bias for studies with one and two tailed hypotheses were used on R Studio. Estimates of severe impacts of both one tailed and two tailed publication bias suggest the overall effect size could have been affected, but all estimates still indicate a large effect size (see Table 7).

Table 7

The overall effect size adjusted for publication bias estimates for the mental disorder meta-analysis

Type of Effect Size Estimate	Effect Size Estimate
Unadjusted estimate	1.03
Moderate one tailed selection bias	1.01
Severe one tailed selection bias	0.98
Moderate two tailed selection bias	1.02
Severe two tailed selection bias	1.01

Due to the low number of studies in the personality disorder meta-analysis, publication bias was not explored.

1.5 Discussion

1.5.1 Summary and Interpretation of the Results

The main aim of the systematic review and meta-analysis was to determine whether individuals experiencing mental disorders or personality disorders have higher levels of loneliness than individuals without either of these diagnoses. The review focussed on studies that directly compared mental disorder/personality disorder participant groups with healthy controls where loneliness was measured

using a well-established, reliable and valid self-report measurement of subjective loneliness. Nineteen studies (thirty effect sizes) were included in the meta-analysis, with twenty-two included in the review more generally.

The findings demonstrate an overall large effect for mental disorder and personality disorder on loneliness. No studies found that healthy controls were lonelier than those with a mental or personality disorder, although one study found a non-significant difference between healthy controls and individuals with an Axis I disorder (Johnson et al., 2000). When considering the reason for this singular outlier, there are a number of possible explanations. Firstly, the sample size for the mental disorder group was low (thirty six participants) and so the study may have been underpowered and potentially missed a true effect. However, since a number of other studies in the meta-analysis had a similar sample size (eleven studies had mental disorder/personality disorder group sample sizes of forty or below) and did find a significant effect of psychopathology on loneliness scores, this is unlikely to be the only explanation. Johnson et al. (2000) used a solely male sample which could have led to an overall lower level of loneliness in this group since males have been found to experience less loneliness than females (Victor, Burholt & Martin, 2012). Moreover, this sample was aged between 23-60 years old. Research has found that loneliness peaks during adolescence and early adulthood and declines until late old age (Luhmann et al., 2016). The sample used in Johnson et al. (2000) contains individuals of an age range that experiences lower levels of loneliness than those outside of these parameters. It may be that in choosing a small sample size of only males who are mostly in middle adulthood the impact of mental disorder on loneliness was “diluted” by the positive impact these demographic factors have on loneliness.

Analyses suggested significant heterogeneity between studies beyond that accounted for by the random effect model of the meta-analysis. Post-hoc subgroup analysis provided no evidence of differences in effect sizes based on measurement type (unidimensional versus multidimensional) or study quality. However, a significant

difference between effect sizes and the category of the disorder investigated in the study (personality disorder, mood disorder, anxiety disorder, psychosis, eating disorder and mixed mental disorders) was found.

The overall effect size was also calculated only for the studies with participants who had mental disorders. The mean effect size was still large, albeit smaller. Additionally, there was no evidence of heterogeneity between the studies in this analysis, suggesting that the difference in loneliness for those with mental disorders and those with personality disorders compared to those without either diagnoses is not the same. This also suggests that the difference in loneliness scores between all the mental disorders included in the studies and healthy controls is significantly similar. When conducting a meta-analysis including only the studies that had participants with personality disorders, an overall large effect size was obtained, and no heterogeneity found between studies. This was a larger effect size than obtained from the studies on mental disorders. As three of the four studies included participants with BPD only, it is not possible to know whether all personality disorders have a similar level of loneliness compared to healthy controls. Moreover, this analysis was conducted on a very small number of studies, and so must be interpreted with caution.

Some evidence of publication bias was found when including all the studies in the original meta-analyses, although estimations of the impact of severe one tailed or two tailed publication biases still yielded a large overall effect size. However, the effect sizes were different compared to the unadjusted estimate. No evidence of a strong publication bias was found when including only studies that examined mental disorders, although there was still evidence of a reporting bias for studies with larger effect sizes and larger standard errors. It is plausible that these large errors are indications of smaller sample sizes. Due to the small number of studies, examination of publication bias in the personality disorder meta-analysis was not possible.

These findings suggest that overall, individuals with a mental or personality disorder experience greater loneliness than those without such disorders. The extent

of this difference appears to vary between disorder types, particularly when comparing personality disorders to mental disorders. The results suggest that although both types of psychopathology are associated with higher loneliness, personality disorder may have a stronger association. Overall, it remains unclear what role loneliness plays in mental disorder and personality disorder, but an association appears apparent. Research has shown loneliness to predict depressive symptoms (Cacioppo, Hawkley & Thisted, 2010; Holvast et al., 2015), alcohol dependence (Akerlind & Hornquist, 1992) and eating disorders (Leine, 2012) and have additional adverse effects on mental disorder outcomes, such as increasing psychiatric hospitalisations (Prince, Oyo, Mora, Wyka & Schonebaum, 2018). Studies have also found mental disorders precede loneliness, such as depression, anxiety and eating disorders (Ausin, Munoz, & Castellanos, 2017; Levine, 2012; Van Beljouw et al., 2010). Therefore, it is likely that loneliness and psychopathology are intertwined in a bidirectional relationship.

1.5.2 Theoretical Explanations

Cacioppo et al. ‘s (2018) evolutionary theory of loneliness (ETL) posits that loneliness is an evolutionarily advantageous emotional response to a perceived lack of social connectedness. Within this framework, humans are viewed as social creatures, where survival relies on being part of a group. Consequently, the emotional pain of loneliness is a signal to an individual that connectedness with others must be sought and so is accompanied by a “thirst” for social connection. Human attachment is not simply characterised by being in the company of others, but by developing an emotional connection in which we feel the other person holds us in mind, understands us and offers us safety (Cassidy & Shaver, 2009). This means that the cure for loneliness is not simply being around other people but having attachments of the aforementioned quality. ETL proposes that, since being disconnected with others is seen as a threat to survival, loneliness increases vigilance for social threat and a sense of vulnerability. A heightened vigilance for threat is linked to a number of

physiological stress responses, which in turn impede an individual's ability to regulate emotions. This leads to a decreased capacity for cognitive processes such as social cognition, resulting in a more threat aligned cognitive style. If this "threat system" remains heightened for long periods it can lead to decreased sleep quality, and an increase in physiological problems related to stress, such as autoimmune diseases, cardiovascular disorder, or vascular diseases such as strokes. These diseases have been found to be associated with loneliness (Caspi et al., 2006; Valtorta et al., 2016) and so could be explained by the presence of a heightened "threat system" activated by feelings of loneliness.

According to ETL, acute loneliness is likely to be successful to survival as the "thirst" for social connectedness sufficiently drives the individual to seek out and forge the attachments they crave. As chronic loneliness impedes social cognition, it becomes a perpetuating cycle where long term loneliness leads to further loneliness as it impedes the use of necessary skills to build relationships. Negative social attributions and expectations can lead to an individual behaving in ways that may elicit negative responses from others, which can serve to confirm the beliefs held by the lonely individual. An individual may then actively isolate themselves as their attempts to connect with others are not fruitful, which in turn could lead to a poorer sense of self and a deeper sense of emotional disconnectedness from the world. However, as the "thirst" for connectedness remains, this leads to increasing discrepancies in the actual and desired attachments an individual has. The lonelier the individual becomes the more they engage in unhealthy or risky behaviours due to increased difficulties with self-regulation. Loneliness has been found to impair performance on attentional tasks (Cacioppo et al., 2000) and is linked to difficulties regulating emotions and behaviours (Hawkley &Cacioppo, 2010). Loneliness is associated with less effort in activities that produce positive emotions such as physical activity (Hawkley, Thisted & Cacioppo, 2009), which is a related to improved physical health and reduced health problems (Warburton, Nicol & Bredin, 2006). Loneliness has also been associated

with a number of other poor health behaviours, such as excessive alcohol use (Akerlind et al., 1992). These unhealthy behaviours may explain the association found between loneliness and a plethora of physical health conditions such as Cardiovascular disease (Caspi et al., 2006), stroke (Valtorta et al., 2016) and ultimately, mortality (Shiovitz-Ezra & Ayalon, 2010). Long term health conditions such as these tend to in turn be associated with mental health symptomatology, such as depressive symptoms (Patten et al., 2005).

This model of loneliness could explain why individuals with mental disorders or personality disorders are lonelier than individuals without such disorders. Negative attributions about the self in relation to others can be seen in a number of mental disorders, along with negative social behaviours such as withdrawal. A diagnostic criteria of mood disorders is low self-esteem and they are characterised by negative cognitions about the self, others and the world, which often leads individuals to avoid social contact (American Psychiatric Association, 2013). Underlying anxiety disorders is a sense of fear due to catastrophic threat-based beliefs such as fear of social judgement and rejection, fears of separation with others or general fears which can lead individuals to withdraw (American Psychiatric Association, 2013). Psychosis is often characterised by paranoid beliefs or unusual delusions that lead individuals to fear others will harm them or lead others to avoid them due to fear or stigma (American Psychiatric Association, 2013). Eating disorders are often characterised by issues with body image, which can affect an individual's confidence to participate in social activities, often leading to avoidance (American Psychiatric Association, 2013). Personality disorders in their essence are associated with a variety of negative and unstable beliefs about the self and others and are characterised by long standing difficulties with building and maintaining relationships (American Psychiatric Association, 2013).

It may be that underlying all mental disorders and personality disorders is distorted social cognition triggered, exacerbated or caused by loneliness, which leads

to impairments in the social behaviours needed to build the attachments that would re-establish a sense of equilibrium in the social threat system. This may be a more intense experience in those with personality disorders as they appear to experience loneliness more intensely than those with mental disorders when compared to healthy controls. This could be due to the chronicity of their difficulties. Personality disorder is thought to begin developing in childhood, emerging in early adulthood, often in the context of adverse and invalidating environments such as childhood abuse (Battle et al., 2004). This is likely to lead the individual to experience emotional loneliness early on in their development, when they lack the necessary social skills to alleviate this. The heightened social threat system that accompanies chronic loneliness is likely to make it difficult to later develop the necessary social skills needed to form fulfilling attachments, which ensures loneliness continues. Individuals with personality disorders are characterised as having difficulties with emotional regulation (American Psychiatric Association, 2013) and so are likely to struggle to regulate their threat system sufficiently to enable them to behave in a prosocial manner and break the chronicity of their loneliness.

Alternatively, Fredrickson's (1998) "broaden and build" theory could also explain the apparent relationship between psychopathology and loneliness. Fredrickson (1998) suggested that the experience of negative emotions tends to lead to specific cognitions and actions, such as avoidance, which narrow the emotional, cognitive and behaviour repertoire. This serves an evolutionary function as negative emotions tend to occur in adverse situations, which allows the individual to focus their behaviour on escaping such circumstances. Conversely, the experience of positive emotions such as joy or contentment, which do not occur in situations of threat, allows an individual to expand their cognitive and behavioural repertoire. This expanded range allows individuals to respond more creatively and flexibly in new situations. This enables them to experience the world differently and learn new skills. Ultimately, this allows individuals to be more receptive to additional positive experiences in the future.

Therefore, it may be the case that loneliness restricts the emotional, cognitive and behavioural responses that precipitate psychopathology, such as social withdrawal, avoidance of activity, negative appraisals and negative emotions, such as low mood and anxiety. Conversely, it may be that the experience of a mental or personality disorder, which are characterised by a number of negative emotions, leads to emotional, cognitive and behavioural responses that limit the opportunities for social connection. Consequently, this increases the likelihood that any social situations will be appraised negatively, ultimately resulting in loneliness.

The need for attachment is likely to differ between individuals and so their propensity to feel lonely will also differ (Cassidy et al., 2009). Different attachment styles have different mental working models for relationships developed through early attachment experiences and these are typically associated with different relationship dynamics and outcomes (Pietromonaco & Barrett, 1997). For example, individuals with a dismissive-avoidant attachment style may be less likely to feel lonely as they desire independence and tend to avoid relationships (Bartholomew & Horowitz, 1991). However, many view this attachment style as a defensive response to relationship difficulties, and that individuals desire relationships but respond to relationship problems with avoidance (Bartholomew et al., 1991). This could mean that individuals with this attachment style are particularly vulnerable to loneliness due to their tendency to avoid connectedness. Conversely individuals with an anxious-preoccupied attachment type tend to crave high levels of intimacy but expect or receive lower levels of responsiveness than desired (Bartholomew et al., 1991). Individuals may be vulnerable to experiencing loneliness due to having a high need for intimacy that is more difficult to obtain and/or a cognitive style that is more likely to perceive social threat. Those with a fearful-avoidant attachment style tend to desire attachments but simultaneously mistrust them and feel undeserving of them, often leading to a mixed pattern of seeking and avoiding connectedness (Bartholomew et al., 1991). Consequently, it becomes difficult to build and maintain fulfilling and

consistent attachments. Research has found that these insecure attachment styles are associated with loneliness in married couples (Givertz, Woszidlo, Segrin & Knutson, 2013). As all three insecure attachments styles have been associated with a number of mental disorders and personality disorders (Bosman, Braet & Van Vlierberghe,2010; Crawford, Livesley & Jang, 2007; Doron, Moulding & Kyrios, 2009; Ein-Dor, Doron, Solomon, Mikulincer & Shaver, 2010; Illing, Tasca, Balfour & Bissada, 2010; Scharfe, 2007), this may explain how individuals with these disorders are likely to be lonelier.

An individual's level of epistemic trust could also affect their propensity to feel lonely. Epistemic trust is an individual's openness to receive information through social communication (Sperber et al., 2010). It is thought that epistemic trust develops in infancy in the context of early attachment relationships, whereby the caregiver uses sufficient ostensive cues and responds contingently to the infant (Corriveau et al., 2009). This demonstrates to the infant that the caregiver views them as an intentional agent who can effectively mentalize them (Corriveau et al., 2009). This opens the infant to social learning as they deem the source of the information to be safe and therefore trusts that the information is relevant and not harmful to them (Corriveau et al., 2009). Low epistemic trust is theorised to lead to lower receptiveness to social communication and thus difficulties in mentalising others and subsequently in building and navigating relationships (Fonagy & Allison, 2014). The essence of loneliness is a dissatisfaction with the current level of connectedness, which could stem from the difficulties in social communication and social cognition that result from epistemic mistrust. Epistemic mistrust may result in a social skills deficit and a tendency to negatively appraise social contact, which can result in a sense of emotional isolation. If this sense of emotional isolation is coupled with a desire to emotionally connect with others, this would result in loneliness. In turn, this may also mean the individual is more vulnerable to psychopathology.

However, these models do not account for whether mental disorder/personality disorder is a result of loneliness, or a cause of it. The models suggest that chronic loneliness becomes a self-perpetuating cycle where further loneliness increases poor social cognition and engagement, which further increases loneliness. However, it is not clear what mechanisms may lead to chronic loneliness in the first instance. It may be that acute loneliness initially occurs due to losses of attachment through circumstances such as bereavement, relationship breakdown, relocation or practical barriers to social contact (such as monetary difficulties), which often precipitate mental health difficulties (Peng et al., 2011). Individuals may be less able to resolve this acute loneliness due to poor coping skills, such as impaired social skills, poor emotional regulation or existing beliefs that affect their response to acute loneliness. Each of these factors have been found to predict mental health difficulties (Berking & Wupperman, 2012; Taylor & Stanton, 2007). In the case of personality disorder, which is thought to develop throughout childhood and adolescence (American Psychiatric Association, 2013), existing difficulties in social skills and attachment styles may lead to difficulties in building and maintaining relationships, which lead to and confounds loneliness.

1.5.3 Impact of Findings

If loneliness is a common experience (and a potential cause and/or aggravator) of mental disorders and personality disorders, then this should be considered when offering treatment for such difficulties. If loneliness is a transdiagnostic symptom in mental disorders, then a common factor in successful therapy could be addressing loneliness. If a sense of disconnectedness with others is a common feature in these disorders, then it would make sense that the focus of the intervention should be relational in nature. A helpful way to address loneliness in therapy, particularly for those with the most chronic experiences of it, is likely to be through the therapeutic relationship itself. This is consistent with the ETL (Cacioppo et al., 2018) which proposes that extended periods of loneliness impede an

individual's ability to build and maintain connections that may reduce their loneliness. As such, it may be important that the connection between therapist and client is of sufficient emotional depth that the client's loneliness begins to reduce, ultimately enabling them to better use social cognition and social skills to build and maintain relationships outside of the therapy room. This could further enable the cycle of loneliness to be broken. It is therefore important that the therapist builds a relationship with the individual based on trust, empathy and respect, which allows the client to feel understood and cared for in a way that they may not currently feel in their personal relationships.

As stated in the theory of epistemic trust, if social cognition is impaired, social learning will also be impaired (Fonagy et al., 2014), which could impede any progress in therapy. As chronic loneliness could cause disruption in social cognition, it is important to reduce this to ensure the client can benefit from information imparted in therapy. It is also important that the therapist considers the impact of chronic loneliness on the client's relationship to them and therefore to the therapy. Social cognitions and maladaptive behaviours towards the therapist may impact therapeutic engagement, such as withdrawal. Therefore, these should be explored and managed.

Additionally, as Cacioppo et al. (2018) proposed that social cognition and maladaptive behaviours help to increase and maintain loneliness, examining thought patterns, resultant behaviours and their consequences should also be focussed on, as is characteristic of many types of therapy. The "gold standard" therapies for personality disorder, namely Dialectical Behaviour Therapy and Mentalising Based Therapy, focus on social cognition and social skill development (NICE, 2009) and their effectiveness may lie in their focus on relationships and the client's patterns of relating to others.

Loneliness often carries a stigma in current Western society, likely due to it's individualistic nature and tendency to privilege independence and individual achievement over social connectedness (Griffin, 2010), Therefore, it is likely that this

is not brought up by those seeking therapy, or indeed by therapists themselves. Euro-centric therapeutic approaches have been criticised for focussing solely on the individual and neglecting to address the individual's role and identity within the relationships (Jordan, 2017). Therefore, it may be useful for therapists to ask about social and emotional connectedness with others when planning treatment with their clients. The treatment could include information about the ubiquity of the experience of loneliness and it's potential impact on emotional and social wellbeing. It may be helpful to use validated measurements of loneliness, such as those seen in the studies within this review, which can allow the therapist and client to assess loneliness and monitor it's progression throughout treatment. This could provide the therapist with valuable information about whether loneliness is leading to barriers in therapy or recovery and provide insight into what may be the most useful techniques to focus on in sessions.

Interventions to reduce loneliness have been shown to be effective when they increase social contact, enhance social skills, address maladaptive social cognitions and provide social support (Mann et al., 2017). However, a meta-analysis of randomised group comparison studies yielded only a negligible effect size of -0.20 (95% CI -0.32, -0.08) (Hawkley et al., 2010), indicating that further investigation of these interventions is needed. The prevalence of loneliness across a number of mental disorders suggests a similarity of experience across disorders that differ widely diagnostically. This provides support for a transdiagnostic approach to understanding and treating psychopathology as opposed to disorder-specific approaches. Effective treatment of psychopathology may involve focusing on the processes and mechanisms that help to develop and maintain psychopathology, such as cognitive processes and behavioural responses. As stated earlier, many of the mechanisms that have been theorised to contribute to the development and maintenance of loneliness are also observed in various mental and personality disorders.

1.5.4 Limitations

The current review has several limitations that need to be considered when interpreting the results. Firstly, there are a relatively small number of relevant studies within the literature. Consequently, there are few studies included in the review and even fewer in the meta-analyses. This limits the confidence in the representativeness of these results, particularly as some disorders were only measured in a few studies or not at all. This is particularly true for the post-hoc mediation analyses and for the post-hoc meta-analyses that only included four studies that examined personality disorders. When conducting meta-analyses on small numbers of studies the risk of error in the estimate of between-studies variance is high, which can in turn lead to errors in estimating the summary effect (Borenstein, Hedges, Higgins & Rothstein, 2009). As some disorders were vastly underrepresented in the studies, it is even more difficult to draw conclusions about their association with loneliness or the possible nature of the relationship between psychopathology and loneliness. When including studies with participants with any mental or personality disorder we found a potential transdiagnostic symptom or factor. However, heterogeneity tests find variability between diagnostic categories, which suggests other factors could influence this relationship and overestimate the actual effect size.

Additionally, some evidence of publication bias was found in the overall meta-analysis. This indicated a bias towards studies that found large effect sizes with low sample sizes and so the actual effect of psychopathology on loneliness may have been exaggerated. Due to a low number of studies in the personality disorder meta-analysis publication bias was not explored. However, the confidence intervals of the studies were wide, including that of the overall effect size, suggesting that the actual effect size may be considerably larger or smaller than estimated. This was not true for the mental disorder meta-analysis, in which the confidence intervals for the overall effect size was relatively narrow. This suggests the actual effect size is unlikely to differ substantially from the estimated value.

There are further difficulties with the generalisability of the results. Some studies included samples of a single gender, or provided separate results based on gender and ethnicity. The effect sizes for these samples may have been influenced by these demographic distinctions, potentially skewing the overall effect size. As ethnic minority status and female gender has been associated with increased loneliness (Pinquart & Sorensen, 2003; Victor, Burholt & Martin, 2012) the inclusions of samples with only individuals of these backgrounds may have exaggerated the loneliness score obtained in these studies. This could have contributed to a higher observed overall effect size than the true effect size. For example, one study found males to be lonelier than females and another study found bigger effect sizes in German participants than Turkish participants. Two studies included individuals with mental disorders and a history of recent suicidality. Suicidality is associated with loneliness (Mezuk, Rock, Lohman & Choi, 2014) and this could have also skewed the effect sizes found in these samples. These participant groups had some of the highest effect sizes across all the studies and this could have led to an overestimation of the overall effect size and affected the publication bias analysis.

A number of the studies used a participant sample in late adolescence or early adulthood. Some studies sourced their control groups from students in higher education. As research has shown that loneliness peaks during adolescence through to middle adulthood (Luhmann et al., 2016), this could have also influenced the loneliness scores collected in the studies and exaggerated the estimated overall effect size. Moreover, many of the studies did not use matched control groups, limiting the accuracy of their comparison with the mental/personality disorder groups. However, due to the small number of studies available for comparison and a lack of clarity in the participant demographics of some of the studies, it was not possible to test the impact of these variables statistically.

Additionally, the sampling of participants differed between studies. A number of studies recruited participants from mental health clinics where a trained

professional assessed diagnosis. In other studies, some participants were recruited through general surveys or population studies and diagnosed using clinically validated self-report measures. There may have been differences in loneliness between those that are seeking help for their psychiatric symptoms and those that are not. For example, as chronic loneliness has been proposed to lead to avoidance of social contact and a sense of hopelessness regarding their isolated state (Cacioppo et al., 2018), it may be the case that participants who were attending mental health clinics were unlikely to represent those experiencing the most chronic of loneliness. However, population studies may have been more likely to include individuals with the most chronic levels of loneliness. Therefore, it is possible that the effect size found in a study was affected by the source of the samples used.

As this review focussed on cross-sectional studies and the loneliness measures only measure current loneliness, and not the chronicity of it, no assertions can be made about the causal relationship between mental and personality disorders and loneliness. Furthermore, as discussed in Cacioppo et al.'s (2018) theory of loneliness, we cannot know if those with mental or personality disorder experience more acute loneliness or chronic loneliness.. Finally, when reflecting on possible publication bias, it is evident that there was a reporting bias for studies with high positive effect sizes, despite having larger standard errors, suggesting weaknesses in the studies methodologies, such as small sample sizes. This could mean that the overall effect size of mental and personality disorders has been overinflated and needs to be interpreted with caution.

1.5.5 Future Research

Further research needs to explore the relationship between mental disorders and loneliness by investigating the prevalence of loneliness in a wider variety of mental disorders and personality disorders in comparison to healthy controls. Such studies could further substantiate the results of this review. It is important that these studies improve upon the quality of the current studies, for example by using large

representative samples. In this research, consideration should be given to other variables that have been previously related to loneliness. These factors include gender and ethnicity and therefore it would be helpful to control for their contributions in order to isolate the impact of mental disorders or personality disorders on loneliness.

The studies included in this review did not investigate the temporal relationship between loneliness and psychopathology and so further research into whether loneliness precedes or follows psychopathology would help to understand the nature of this relationship further. This could be achieved through longitudinal designs and multilevel models that can examine the impact of various factors over time. Wang et al. (2018) found some emerging evidence in the literature of loneliness at baseline predicting poorer outcomes for those with depression. Unfortunately, only a small number of studies were included in this review. To date, reviews on the longitudinal impact of loneliness on other mental disorders have not been conducted. Research into the exact mechanisms of this relationship would then help to understand the development and maintenance of mental and personality disorders in the context of loneliness. Collectively, this research could inform and improve interventions for these disorders as well as understanding and preventing loneliness more generally in the population. Finally, it would also be useful to understand the relationship loneliness has to other proposed transdiagnostic elements, such as attachment, to construct more sophisticated models of self-other relations and their influence on wellbeing and functioning. This could further inform treatment of psychopathology.

1.5.6 Conclusion

In conclusion, this review found evidence for higher loneliness in individuals with mental disorders and personality disorders. In addition to this, there was some evidence that this may involve a stronger relationship in personality disorders. This effect was not mediated by study quality or the type of loneliness measure used, but the inclusion of personality disorder and mental disorder together in the meta-analysis

indicated heterogeneity between the studies. Removing the effect sizes from personality disorder studies from the analysis removed the heterogeneity across studies. The exact nature of the relationship between loneliness and psychopathology is unclear and this review cannot offer any evidence as to the causal relationship between loneliness and psychopathology. Research has found that various indices of psychopathology can occur as a result of loneliness as well as precede it. Cacioppo's (2018) evolutionary theory of loneliness offers a promising framework to understanding the relationship between loneliness and psychopathology. Within this framework, loneliness and mental disorders form a perpetuating cycle and that many of the mechanisms and consequences of loneliness are also that of psychopathology. Due to the number of limitations to this review, the results must be interpreted with caution, To overcome these limitations and increase the confidence in any conclusions formed, a greater volume of robust studies into mental disorders and personality disorders and loneliness need to be conducted. Research in the future should also focus on understanding the mechanisms and developmental relationship between psychopathology and loneliness and move towards creating statistical models that can elucidate this.

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Part 2: Empirical Research Paper

The Role of Epistemic Trust in the Treatment of Major Depressive Disorder

2.1 Abstract

Aims: To explore the relationship between pre-treatment epistemic trust in others (ETO), epistemic trust in therapists (ETT) and expected and perceived contingent responses and overall depressive symptom severity and it's rate of change over therapy.

Method: Forty-six adults with major depressive disorder (MDD) receiving psychological therapy in IAPT participated in the study. Prior to therapy, participants completed a demographics questionnaire, the Epistemic Trust Scale (ETS) and the Expected Contingent Responses Scale (ECRS). During therapy, they completed the Working Alliance Inventory – Short Revision (WAI-SR) and the Perceived Contingent Responses Scale (PCRS). Multilevel modelling was used to measure the growth curve of depressive symptom severity (measured by the PHQ9) throughout sessions.

Results: Lower ETO scores were associated with a slower rate of PHQ9 score decline. ETT score had no additional impact on the growth curve. Neither ECPRS nor PCRS scores were associated with overall PHQ9 scores and this was not mediated by ETO or ETT scores.

Conclusions: Epistemic trust for others could influence the rate of progress in therapy and so measuring this construct could be useful in treatment planning. However, these results should be interpreted with caution due to lack of power and the use of measures with unknown psychometric properties.

2.2 Introduction

2.2.1 Major Depressive Disorder (MDD)

MDD has a lifetime prevalence of 9.5% and causes a significant economic burden internationally, exceeding that of asthma, hypertension and rheumatoid arthritis (Berto, D'Ilario, Ruffo, Virgilio & Rizzo, 2000). The main symptoms of MDD include depressed mood, loss of interest or pleasure in activities, fatigue, feelings of worthlessness or guilt, difficulties concentrating, suicidal ideation, slowed thoughts, slowed movements and appetite and weight changes (American Psychiatric Association, 2013). For a diagnosis of MDD to be made, at least five of these symptoms must be present for at least two weeks, including low mood or loss of interest or pleasure (American Psychiatric Association, 2013).

A number of biological factors have been linked to the development of MDD, including genetics (Levinson, 2006), temperament and personality (Finch & Graziano, 2001), serotonin levels (Lesch et al., 1996), cortisol levels (Herbert, 2013), abnormal circadian rhythms (McClung, 2013) and a variety of physical health conditions such as Diabetes Mellitus (Nouwen et al., 2010), cancer, lung disease, heart disease, arthritis and stroke (Polsky et al., 2005). A number of environmental factors have also been associated with the development of MDD, including negative life events (Phillips, Carroll & Der, 2015), poor social or emotional support (Santini, Kovanagi, Tyrovolas, Mason & Haro, 2015), loneliness (Cacioppo, Hughes, Waite, Hawkley & Thisted, 2006), bereavement (Green et al., 1992), marital relationship difficulties (Fincham, Beach, Harold & Osborne, 1997), trauma (Schumm, Briggs-Phillips & Hobfoll, 2006) and insecure attachment styles (Bifulco, Moran, Ball & Lillie, 2002). Research has explored the possible causes of depression for many years; however, it has failed to find a single biomarker or environmental factor that is common to all incidences of the condition, or at least, the majority of cases of MDD (Strawbridge, Young & Cleare, 2017). Consequently, this research suggests a high level of variability between individuals with depression and indicates that the mechanisms of depression are likely

to be complex and numerous. This heterogeneity between cases of depression poses challenges for developing successful treatments of the condition.

Current research has found that a variety of therapies can offer effective treatment for depression, although none of them offer success in all cases and have no real clinically significant difference in their efficacies. For example, a recent RCT compared the efficacy of Cognitive Behavioural Therapy (CBT) and Interpersonal Therapy (IPT) for MDD and found that both therapies are effective treatments, although CBT had a quicker initial effect (Mulder, Boden, Carter, Luty & Joyce, 2017). Moreover, Cuijpers et al. (2013) conducted a meta-analysis and found no statistically significant differences in effectiveness between psychotherapy and antidepressant medication. In general, psychotherapies tend have a similar impact on depressive symptoms, with meta-analyses finding that various types of psychotherapies had effect sizes ranging from -0.14 to -0.56 (Linde et al., 2015). Another meta-analysis compared the difference between a number of psychotherapies for depression and found statistically negligible differences across all psychotherapies, except for IPT, which was slightly superior to other treatments, although the effect size was small (Cuijpers, van Straten, Andersson & van Oppen, 2008).

2.2.2 Common Factors in Psychological Therapy

The comparative effectiveness between psychotherapies has been termed the "Dodo bird verdict" (Wampold et al., 1997). Psychologists have questioned whether there is a commonality between these therapies that explains their practically equal effectiveness (Cuijpers, Reijnders & Huibers, 2018). This may mean that the theory specific techniques that each therapy emphasises may not be the key element involved in treating psychopathology and that transtheoretical factors in therapy, or "common factors" are responsible for therapy outcomes (Cuijpers et al., 2018). Wampold (2015) proposed the "contextual model" of how psychotherapies are effective in treating psychopathology. This model states that once a basic bond has been created between therapist and client, psychotherapies can have a therapeutic

effect through three pathways. The first, is through a deeper bond created between client and therapist, whereby each party accurately mentalizes the other and are honest and genuine with one another (Wampold, 2015). This is therapeutic to the client as they experience a caring relationship. Secondly, therapies offer an explanation for the difficulties the individuals face and a rationale for how to address them, offering hope to the client that their problems are surmountable and a sense of how this can be achieved (Wampold, 2015). Lastly, each therapy, regardless of diagnosis, offers it's own specific methods for enacting change that promote healthy behaviour in individuals (Wampold, 2015). For example, IPT seeks to improve relationships in the client's life and CBT seeks to encourage more helpful ways of thinking about themselves, others and the world. However, the results of a number of meta-analyses exploring the differences in efficacy between therapies is mixed, with some suggesting little or no difference, and others finding significant differences (Cuijpers et al., 2018).

Wampold (2015) proposes that factors that influence the relationship between therapist and client will predict therapy outcomes. A number of possible common factors have been identified in the literature. Laska, Gurman and Wampold (2014) reviewed the evidence for common factors and report that according to three meta-analyses, working alliance accounts for 7.5% of the variance in the outcome of therapy, while therapist accounts for 5%, goal collaboration 11.5%, positive regard 7.3% and congruence 5.7%. This suggests that relational and therapist-related factors contribute to a significant amount of variance in therapy outcome. However, another meta-analysis found a small effect (d=0.24) for patient expectations on therapy outcome, suggesting patient factors can also influence the outcome of therapy (Constantino, Arnkoff, Glass, Ametrano & Smith, 2011). Additionally, Levy, Kivity, Johnson and Gooch (2018) conducted a meta-analysis and found that greater attachment security predicted better outcomes in therapy with a small to medium effect size (d=0.35), but not when controlling for pre-treatment symptom severity.

Furthermore, Schwartz, Hilbert, Schlegl, Diedrich and Voderholzer (2018) found that patient's self-efficacy also predicted therapy outcome, and this mediated the relationship between patient's contentment with their therapist and treatment outcome. However, it appears that factors related to the relationship between therapist and client collectively explain more of the variance in therapy outcome.

Baldwin, Wampold and Imel (2007) used multilevel modelling to explore the specific contributions that both therapists and patients make to working alliance. They discovered that therapists who formed better alliances generally with a range of patients had better outcomes in therapy overall. However, patients who were able to form better alliances did not necessarily have better outcomes in therapy. Nonetheless, the wide array of literature seems to suggest that relational factors between therapist and patient play a key role in therapy outcomes, and that this can be affected by both patient and therapist factors, suggesting a complex interplay of common factors.

Thus, working alliance is considered to be one of the most important common factors and has been widely researched (Cuijpers et al., 2018). Working alliance is characterised by the bond between therapist and client and their agreement on the goals and associated tasks of therapy (Bordin, 1979). However, many studies on working alliance have only examined associations and cannot determine whether working alliance has any causal relationship with therapy outcome. Zilcha-Mano (2017) reviewed a small number of studies that use regression models to examine working alliance temporally. These studies suggest that working alliance may precede symptom reduction in therapy. Zilcha-Mano (2017) posited that an individual's general ability to form relationships prior to therapy can influence whether a therapeutic alliance is formed and thus whether therapy is effective. However, this disposition can be altered by the interactions with their therapist session by session, which can alter the outcome of therapy. Such research suggests that it may be useful to place more emphasis on developing a therapeutic alliance with those who have relational

difficulties prior to therapy to enhance the likelihood that they will benefit from treatment. Thus, understanding the mechanisms that underpin therapeutic alliance could inform therapy practices and enhance therapy outcomes, particularly for those with interpersonal difficulties.

2.2.3 Epistemic Trust

Fonagy, Luyten, Allison and Campbell (2017) propose that epistemic trust may affect an individual's ability to benefit from therapy and that addressing it could be a key relational common factor that underpins the development of a good therapeutic alliance and thus, successful therapy. Epistemic trust is an individual's openness to receive information through social communication (Sperber et al., 2010). Communication is an important source of social and cultural learning which has been fundamental for human evolution as it allows important knowledge to be passed on from person to person and generation to generation (Csibra & Gerely, 2009). This can include knowledge about skills, behaviours, practices, and the meaning and use of language and resources (Csibra et al., 2009). Across cultures, despite vast differences in child-rearing customs, humans rely on communication to transmit such information (Csibra et al., 2009). As not all social communication will be truthful, accurate or relevant, it is important that individuals discern between information they should use and information that may be harmful or unhelpful. This is known as epistemic vigilance; a natural self-protective mechanism which needs to be relaxed in order for the individual to learn from social communication (Sperber et al., 2010).

Epistemic trust is thought to develop throughout infancy and childhood in the context of early attachment relationships. Here, a sensitive attachment figure provides a safe environment in which learning can take place (Corriveau et al., 2009). Responding contingently and accurately to an infant, using ostensive cues such as smiling, or calling an infant's name, demonstrates to the infant that you recognise them as an intentional agent and that you are able to accurately mentalize them (Fonagy et al., 2017). This allows them to relax epistemic vigilance and to receive

information from this source as it is deemed as safe and relevant (Csibra et al., 2009). Secure attachment patterns have been associated with frequent and consistent ostensive cues from caregiver to infant (Fonagy et al., 2017). Mikulincer (1997) found that adults with insecure attachment styles were generally less open to new information compared to securely attached adults, preferring to rely on their own pre-existing appraisals. Thus, it is theorised that a lack of contingent responding from a close attachment figure or experiences of receiving unsafe information through social communication is likely to lead to the development of low epistemic trust, or epistemic mistrust, which makes individuals less likely as adults to be open to social communication and thus less able to effectively mentalize (Fonagy & Allison, 2014). Poor mentalizing ability is linked to difficulties with emotional regulation and forming relationships (Fonagy, Luyten & Bateman, 2015).

Hanson et al. (2017) found support for this theory in an experiment comparing the social learning of adolescents who had experienced physical abuse compared to adolescents with no history of maltreatment. Those who experienced abuse were less able to learn through reinforcement in an experimental situation. Consequently, they were more likely to make decisions earlier on in the learning process, while disregarding information already received about the reward system used in the study. It appeared that these adolescents were less likely to attend to current information being transmitted through social communication and this resulted in them adapting to experimental conditions less successfully. Additionally, Corriveau et al. (2009) found that infants who were securely attached to their mother showed preference for information given by their mother, unless the information was improbable, in which they relied upon their own perceptions. Infants with avoidant attachments styles were less likely to trust information received from their mother and preferred the information given by the stranger. Infants with a resistant attachment style did not trust information given by a stranger, even when information given by their mother was improbable. Infants who had a disorganised attachment style dismissed information given by both

their mother and the stranger but also did not trust their own appraisals. This study not only demonstrates the link between attachment styles and trust of socially received information, but also demonstrates that epistemic trust for different individuals can differ widely.

A generally high level of epistemic trust can be advantageous to an individual as it allows them to frequently receive information through social communication from a variety of sources, increasing their capacity for adaptability to their environment. However, it may put them at higher risk of receiving and utilizing untrustworthy information that can lead to adverse effects. An individual with generally low epistemic trust will find developing and adapting to their surroundings more challenging as they will receive less information through social communication and so will rely on outdated and irrelevant knowledge and develop inflexibility, resistance to change and a general sense of emotional isolation and suspicion of others (Fonagy et al., 2014). However, they are also likely to be more protected from untrustworthy information. Ideally, an individual develops flexibility, which enables them to judge socially received information based on it's context, enabling them to successfully utilise safe and relevant information and dismiss unsafe or inaccurate information and rely on their own appraisals. Inflexibility in thinking is theorised to impact upon the persistence of difficulties in an individual's life and their resistance to changes that may alleviate them (Fonagy et al., 2017). This idea is potentially relevant to the treatment of psychopathology and suggests that a patient's pre-existing level of epistemic trust could influence their ability to utilize and benefit from the information and skills imparted during the therapy process.

Fonagy et al. (2017) therefore hypothesise that an important relational common factor of therapy is increasing a client's epistemic trust. Therefore, they propose that in the initial stage of therapy the therapist should focus on understanding the mind of the client, using psychological models and formulation. An important part of this stage is the therapist's use of ostensive cues, such as eye contact, addressing

the client's current concerns and responding contingently to the client's emotional and behavioural responses in the room (Fonagy et al., 2017). These cues demonstrate to the client that the therapist is interested in and understands the client's perspective and so information they may convey is likely to be trustworthy and relevant to them (Fonagy et al., 2017). Without increasing the client's epistemic trust, at least for their therapist, it is unlikely that the client will truly benefit from treatment as they will be closed to any ideas the therapist may offer about the reasons for their difficulties and the ways in which the may be overcome (Fonagy et al., 2017). Thus, Fonagy et al. (2017) proposes that stimulating epistemic trust through accurate mentalizing is an important relational common factor of therapy in addition to working alliance. A prerequisite of forming a bond of trust and respect (characteristic of good working alliances) is likely to be a sense of feeling understood by the therapist. This would then increase the likelihood that any therapeutic tasks suggested by the therapist will be deemed as relevant and thus agreed upon by the client, which is the essence of a working alliance (Allison & Fonagy, 2016). In the second stage of therapy, when the patient has begun to be open to social communication (at least from their therapist), they become increasingly interested in the therapist's perspective and the information they impart to them (Fonagy et al., 2017). This stimulates the client's ability to mentalise and use social cognition, which allows them to build different or new relationships in their life (Fonagy et al., 2017). In the third stage, the client generalises epistemic trust to outside the therapeutic relationship and so becomes open to social learning, which enables them to navigate through their difficulties, and the world, effectively (Fonagy et al., 2017).

2.2.4 Rationale, Aims and Hypotheses

To date, no research has explored the impact of openness to social learning (i.e. epistemic trust) on the outcome of psychotherapy. Furthermore, it has not been determined whether improving openness to social learning is a potential common patient or relational factor in effective therapy. Examining common factors in therapies

could have an important clinical and public health impact. In understanding what elements make multiple therapies equally effective, we may be able to improve the effectiveness of each of these therapies. Much research has already identified working alliance as an important relational common factor in effective therapy (that can indeed also be influenced by therapist and patient factors). This is of particular importance in the case of depression, where an estimated 12-20% of cases do not respond to multiple evidence-based treatments and are considered “treatment resistant” (Kubitz, Mehra, Potluri, Garg & Cossrow, 2013). It is also the case that there is an accumulated likelihood of an individual experiencing further episodes of MDD with each episode they have (Burcusa & Iacono, 2007). Despite this, the effect sizes of treatment for depression have not significantly increased across the last decade of research (Cuiijpers et al., 2018).

Cuijpers et al. (2018) emphasise the importance of experimental design in building an evidence base that begins to address the question of how therapies work. In order to begin to understand how common (or indeed specific) factors influence therapy, research needs to look at associations over time/sessions, control for other potential covariates and examine dose-response relationships. Cuijpers et al. (2018) state that most research to date has only been correlational and that building an evidence base of the therapy process will requires large sample sizes, complex analyses and multiple individual studies and so a large amount of resources will be required.

Given the lack of research into the level of openness to learning through social communication and outcomes in psychological therapies, and the methodological limitations in research into common factors, the present study aims to explore the relationship between epistemic trust prior to treatment and the rate of change in depressive symptom severity over therapy sessions/time, controlling for the covariates of initial symptom severity and working alliance . Although working alliance may in part be an indirect measure of epistemic trust, this study will explore if the latter

can be independently measured as a predictor of the course of therapy. Given the theory of epistemic trust outlined above, the following hypotheses are made (controlling for working alliance and initial symptoms severity):

1) The depressive symptoms severity of individuals with low levels of epistemic trust for others prior to treatment will reduce at a slower rate during the course of therapy than those with higher levels of epistemic trust for other.
2) The rate of reduction of depressive symptom severity for those who have low levels of epistemic trust specifically for therapists prior to treatment is likely to be slowed even further.

Additionally, the present study seeks to explore whether the process of change across sessions is related to possible variations in epistemic trust between therapist and client. Specifically, whether the client's overall perception of their therapist's level of contingent responses, which is assumed to be an influence on epistemic trust within a particular relationship, is associated with the change of depressive symptom severity during treatment, when controlling for the covariates of initial symptom severity, working alliance and expectations of contingent responding from the therapist prior to treatment. Given the theory of epistemic trust, the following hypothesis is made:

3) The overall level of a client's perceived contingent responding from their therapist during treatment will be negatively associated with the overall depressive symptom severity during treatment
4) Epistemic trust prior to treatment will moderate the effect of the overall perceived contingent responding on depressive symptom severity-specifically, lower levels of epistemic trust (for others and therapists) prior to treatment will decrease the influence of the perceived contingency of responses in treatment on depressive symptom severity as participants with low trust will be less sensitive to the therapist's contingency.

2.3 Method

2.3.1 Design

The study is a longitudinal, repeated measures observational design that measures depressive symptom severity, epistemic trust and expected contingent responses prior to therapy. It then measures depressive symptom severity, perceived contingent responses and working alliance throughout the course of talking therapy within an “Improving Access to Psychological Therapies” (IAPT) setting. A single group of adults with MDD was used.

2.3.2 Participants

The study received ethical approval from the London Queen Square Research Ethics Committee (REC number: 16/LO/0077, IRAS project ID: 161423, (see Appendix 1) and informed consent was obtained from all participants before being included in the study. The online consent form and study information sheets are included in Appendix 2 and 3.

91 adults aged between 18 to 52 years were recruited to take part in the study from the IAPT services of two NHS trusts. Research Assistants employed by the trusts contacted eligible clients on the waiting list for one-to-one talking therapies via telephone and/or email and sought consent to send their contact details to the study team, who contacted them via telephone and/or email to discuss participation in the study further. To be included in the study, participants needed to be aged 18-60 years and currently on the waiting list for face-to-face talking therapy in IAPT for MDD. A diagnosis of MDD was made my therapists in the IAPT services. Participants joined the study after assessment in IAPT and finished the study once they had completed their therapy sessions (or when they withdrew, whichever was sooner). Any participants who reported beginning therapy before completing the study measures were excluded from the analysis. Participants were required to be fluent in English as all study measures and communications regarding the study were in this language only. Participants were excluded if they had a current or past history of neurological

disorders or trauma. Participants were also excluded if they had a learning disability requiring specialist educational support and were unable to understand written or spoken English as adapted versions of the study measures were not available. By nature of the IAPT exclusion criteria, participants with current Psychosis, a diagnosis of Bipolar Disorder, current high use of substances or high levels of risk to self or others were excluded from the study.

From the ninety-one participants recruited, fourteen participants withdrew from the study before starting therapy and only forty-nine had begun therapy sessions, and thus eligible for the present study, before data analysis. The larger study faced some difficulties with funding immediately prior to the commencement of data collection for the present study, which meant that the collection of data began significantly later than originally planned. It was typical for participants to wait a number of months after their assessment appointment to start their therapy sessions. As a result of the shortened time scale for data collection and the typical waiting time for therapy, a large number of participants in the study had not begun therapy before data collection had ceased. The participants who had not started therapy yet were excluded from the analyses due to lack of eligibility. Of the forty-nine eligible participants, three were excluded as they were receiving group or telephone therapy sessions. Sixteen participants had partially missing data and so were not included in all of the analyses. Participant characteristics for the forty-six eligible participants that had begun therapy (and thus included in this study) are summarised in Table 1.

Table 1

Characteristics of the participants included in the study

Variable	Mean (SD)/%
Age Mean (SD)	 30.78 9.23
Gender (% female)	 72
Ethnicity (% White)	 50
Education level (% higher education)	 72
Employment status (% employed)	 52
Household income (% > £35k)	 37
Previous therapy (% yes)	67

Note: One participant did not provide demographic information

Table 2 summarises the characteristics of the fourteen participants that dropped out of the study prior to starting therapy. Due to the limited data available prior to drop-out only the variables in which data was available for the majority of participants is reported. These characteristics were compared between the study sample and those that dropped out using t-tests, chi-squared tests or Fischer exact tests. No significant differences were found between these groups for any of the characteristics listed in Table 2.

Table 2

Characteristics of the participants that dropped out of the study

Variable	Mean (SD)/%
Age	
Mean	34.92 [b]
(SD)	13.74
Gender	
(% female)	53
Ethnicity	
(% White)	64 [a]
Education level	
(% higher education)	57 [a]
Employment status	
(% employed)	43 [a]
Household income	
(% > £35k)	43 [a]
Previous therapy	57 [a]
(% yes)	
Pre-treatment PHQ9	
Mean	16.29
(SD)	6.97
ECRS	
Mean	28.90 [a]
(SD)	5.53

[a] Four participants did not provide this information, [b] One participant did not provide this information

2.3.3 Treatments

Psychological therapy in IAPT services are predominantly low intensity or high intensity CBT. However, individuals sometimes receive counselling, Dynamic Interpersonal Therapy (DIT), IPT, Eye Movement Desensitisation and Reprocessing (EMDR) or Behavioural Couples Therapy (BCT). Participants in the study received between one and 20 sessions of face-to-face therapy. These treatments are offered

in accordance with NICE guidelines for depression (NICE, 2018). No data was collected from the IAPT services by the research team regarding which therapy participants were receiving, but total session number was obtained. The therapy received by participants was most likely to be CBT or counselling.

2.3.4 Measures

2.3.4.1 Patient Health Questionnaire (PHQ9)

Depressive symptom severity was measured using the PHQ9 at every therapy session (Kroenke, Spitzer & Williams, 2001). The PHQ9 is a reliable and valid self-report measure of depressive symptoms and symptom severity (Kroenke et al., 2001). It was not possible to test for internal consistency in the PHQ9 as the data received from the IAPT services included total scores only. However, the PHQ9 has previously obtained a Cronbach's alpha of .89 in primary care settings (Blackwell & McDermott, 2014). It consists of nine items which describe symptoms of depression such as "little interest or pleasure in doing things" and "poor appetite or overeating". It asks individuals to mark on a Likert scale how often in the last two weeks they have experienced these symptoms (0 – not at all, 1- several days, 2- more than half the days, 3 – nearly every day). The PHQ gives one continuous total score for current depressive symptom severity ranging from 0 – 27, with scores of 5-9 indicating mild depression, 10-14 indicating moderate depression, 15-19 indicating moderately severe depression and 20-27 indicating severe depression. The "cut off" score for clinically significant depressive symptoms is 10. The PHQ9 is routinely used in IAPT services across England as a guide to symptom severity, treatment allocation and recovery. See Appendix 4.

2.3.4.2 The Epistemic Trust Scale (ETS)

The ETS (Luyten, under development) is a newly developed self-report scale that aims to measure the current level of epistemic mistrust an individual has in psychotherapists and in others more generally. The measurement produces two subscales (ETT and ETO respectively) for mistrust pertaining to each of these

aforementioned groups of people. There are twelve statements in each subscale. These include “I think my psychotherapist would always be honest with me” and “If you put a lot of faith in people, you will get hurt”. Individuals are asked to indicate how much they agree with this statement by choosing one of the following options; strongly agree, agree, somewhat agree, neither agree or disagree, somewhat disagree, disagree and strongly disagree. Epistemic mistrust is given as a continuous score between twelve and eighty-four for each subscale, with higher scores indicating higher levels of mistrust (i.e. lower levels of trust). To date, the lack of normative data has meant that the creators have not suggested a “cut off” for quantifying whether an individual’s levels of mistrust are considered low or high. This measure is currently being developed and tested at the Anna Freud Centre and so it’s psychometric properties have not yet been fully established. However, the Cronbach’s alpha from the sample in the present study is .81 for the ETO subscale and .87 for the ETT subscale, which suggests both have good internal consistency. See Appendix 5.

2.3.4.3 Working Alliance Inventory-Short Revision (WAI-SR)

Working alliance was measured using the WAI-SR (Hatcher & Gillaspy, 2006). This measurement has good reliability and validity and is recommended for use in research (Martin, Garske & Davis, 2000). The measure also has excellent internal consistency (Paap & Dijkstra, 2017). It had an overall Cronbach’s alpha of .91 in the present sample, which is in agreement with the suggestion of excellent internal consistency. It is a twelve item self-report questionnaire in which individuals have to respond to a statement about what is happening in their therapy sessions, such as “as a result of these sessions I am clearer as to how I might be able to change”, “___and I are working towards mutually agreed upon goals” and “ ___and I respect each other”. Participants are asked to rate how often they feel these things are happening according to five options; seldom, sometimes, fairly often, very often and always. The WAI-SR produces a total continuous score for working alliance, as well as scores for three subscales; goal, task and bond. These subscales are based on

Bordin's (1979) theory of the factors that influence working alliance in therapy, namely having an agreed goal, working on a task that the client agrees will help achieve this goal and having a trusting bond between client and therapist. Higher scores denote a better working alliance. The questionnaire is copyrighted and permission was given to use this measure in the study (see Appendix 6).

2.3.4.4 Expected Contingent Responses Scale (ECRS)

The ECRS is a new measure that has been created for the present study and so its psychometric properties have not yet been established. In the present sample, it had a Cronbach's alpha of .86, suggesting good internal consistency. It is a nine item self-report questionnaire that aims to identify how an individual expects their (future) therapist to respond to them in their sessions. Specifically, how well their therapist will understand them and sense what they are feeling and trying to communicate. A sense of feeling understood is proposed to be a result of an individual responding contingently to what a person brings to the interaction, verbally and nonverbally (Fonagy et al., 2015). It is proposed that experience of a lack of contingent responses from key attachment figures will lead to an expectation of similar responses from future interactions (Fonagy et al., 2015). The items in the questionnaire are statements about how well their therapist will understand them and will sense what they are feeling and trying to communicate to them. The individual must indicate how often this statement is true from five answer options; always, often, sometimes, rarely, or never. For example, "my therapist cannot tell how I am feeling" and "my therapist can sense when my mood is changing in the session". The score ranges from 9 – 45, with higher scores indicating better expectations of contingent responses from their therapist. See Appendix 7.

2.3.4.5 Perceived Contingent Responses Scale (PCRS)

The PCRS is a new measure that has been created for the present study and so its psychometric properties have not yet been established. In the present study sample, it had an overall Cronbach's alpha of .87, suggesting good internal

consistency. It is a nine item self-report questionnaire that aims to identify an individual's perception of how well their therapist understands them and senses what they are feeling and trying to communicate. These feelings are theorised to be demonstrated through the therapist responding contingently to what the client says and does in therapy (Fonagy et al., 2015). As such, the scale aims to indirectly measure the therapist's ability to respond contingently through the individual's sense of being understood. This includes the same items as the ECRS and uses the same rating scale. The score ranges from 9 – 45, with higher scores indicating better contingent responding from their therapist. See Appendix 8.

2.3.4.6 Demographics Questionnaire

The demographics questionnaire was created by the wider research team and consisted of open questions and questions with multiple choice options. It asked participants' their date of birth, gender, ethnicity, parent's ethnicities, place of birth, employment status, occupation, household income, educational level, years in education, parent's educational level, number of previous therapy sessions and any significant losses or separations in their life. Not all of the information gathered in this questionnaire was used for this sub-study. See Appendix 9.

2.3.5 Procedures

The above measures used in the study were part of a larger study on MDD ("Major Depressive Disorder – a computational neuroscience approach"). All the measures outlined above were completed by participants online using the database system "POD", including the consent form for the study. This system allowed for participants to complete questionnaires at their own pace, rather than in one session and assigned participants ID numbers to anonymise their data. Some of the measures (ETS, PCRS and demographics questionnaire) were completed before the participant began therapy sessions and the others (WAI-SR and ECRS) were completed at different timepoints during the course of therapy. Participants were prompted to complete these repeated measures approximately every two to three

sessions of therapy, although the timepoints in which they actually completed these varied (see table 3 for details of the data collected at each timepoints). PHQ9 scores were collected at assessment and in all therapy sessions as part of usual IAPT practice and later given to the research team.

The larger study had three components; the initial “pre-treatment” phase (which consisted of thirty-one measures in total, including the ETS, ECRS and the demographic questionnaire), the “follow up” component (consisting of WAI-SR and PCRS) completed during the course of therapy and an online trust game. I worked with a central research team and a research team in one of the NHS trusts to recruit and guide participants through the “pre-treatment” phase and online game and then independently managed the “follow up” component of the study with all participants. The approximate total time estimated for participants to complete all aspects of the study was three hours; two hours for the initial battery, forty minutes for the follow up component and twenty minutes for the trust game. The estimated time to complete the measures included in this study was one hour in total. Participants who completed all three components of the study were reimbursed £25 for their time, which equates to approximately £8.33 an hour.

Table 3

The number of participants who completed time-invariant measures according to therapy session number

Session	WAI-SR	PCRS
1	5	5
2	21	22
3	11	11
4	17	11
5	10	11
6	10	10
7	9	9
8	9	9
9	6	6
10	3	3
11	2	2
12	3	3
13	1	1
14	2	2
15	0	0
16	1	1
17	1	1
18	0	0
19	1	1
20	1	1

2.3.6 Data Analysis

2.3.6.1 Power Analysis

Given that no previous studies have investigated the impact of epistemic trust or contingent responses on depressive symptoms severity, it is unclear what the expected effect size for these variables would be. Given that a small effect size would not be clinically significant, only medium or large effects would be considered meaningful findings, so power will be considered with medium effect sizes.

For multilevel mixed regression models there are no “rules of thumb” or accurate power calculations to determine sample size as the models are too complex and too many factors within them affect power (Field, 2018). Very little research has been conducted to explore this (Scherbaum & Ferreter, 2009). As the data involves multiple levels, consideration of sample size needs to be taken at each level, depending on which level the variable of interest in the analysis sits (Arnau, Balluerka, Bono & Gorostiaga, 2010). A number of simulation studies have indicated that sample size at level two is more important in determining the accuracy of the estimates reported in the analysis than sample size in level one (Van de Leeden et al., 1997; Van der Leeden & Busing, 1994, both cited in Maas & Hox, 2005). Kreft and De Leeuw (1998) cited in Maas and Hox (2005) state that the smallest acceptable number of groups in multilevel analysis is 30, with groups sizes that are “not too small”.

Maas and Hox (2005) ran a number of simulations using a simple two level regression model and a variety of sample sizes and found that sample sizes of 50 or less at level two caused an estimation of the standard error of level two variances that was too small (by about 15%), but caused no bias in the estimates of the regression coefficients, the variance components or standard errors of the regression coefficient. However, a number of other simulation studies have found a differing results. Two other simulation studies (Busing, 1993 and Van de Leeden & Busing, 1994, cited in Maas & Hox, 2005) found that more than 100 groups were needed for accurate level two variance estimates. Such simulation studies tend to use basic multilevel models,

usually with one explanatory variable at each level, which limits the applicability such results have to the models in the present study which includes multiple variables in each level. Furthermore, Kenward and Roger (1997) stated that in small sample sizes, normal and chi-squared distribution estimates can provide inflated estimations of the distribution of the test statistics in mixed multilevel models and demonstrated this using simulation studies on various types of model designs.

Furthermore, using G*power, a power calculation for a medium effect size in a linear multiple regression, with an alpha of .05 and power of .80, requires a sample size of 68 for two variables (the smallest number used in any of the models in the study) and 109 participants for eight variables (the largest number used in any of the models) (Faul, Erdfelder,Buchner & Lang, 2009). It seems unlikely that a mixed model would require a smaller sample size than a linear one, although to date research has yielded mixed results. Given the evidence, it seems likely that the present study is underpowered and this could affect the accuracy of both the fixed and random effects in the model and so the results should be interpreted with caution.

2.3.6.2 Data Analysis Procedures

Statistical analysis was conducted using SPSS version 22.0 and STATA version 15.0. Tests for normality were conducted prior to analyses, to which the PHQ9, PCRS and WAI-SR were found to be non-normally distributed according to Kolmogorov-Smirnov tests. For the purposes of the multi-level mixed regression analyses the PHQ9 (pre-treatment and during treatment) were transformed by taking square roots. Although the second Kolmogorov-Smirnov test continued to indicate that the square rooted PHQ9 scores still did not follow a Gaussian distribution, the deviation was small and only marginally significant. See Table 4 for a summary of the Kolmogorov-Smirnov tests.

Table 4

The results of the Kolmogorov-Smirnov tests for the variables in the study

Variable	Kolmogorov-Smirnov Test results
PHQ9	*D*(303) = 0.11, p<.0001***
Pre-treatment PHQ9	*D*(45) = 0.10, p=.200
ECRS	*D*(37) = 0.14, p=.072
PCRS	*D*(96) = 0.11, p=.005**
WAI-SR	*D*(96) = 0.11, p=.006**
Epistemic trust of therapists	*D*(37) = 0.13, p=.129,
Epistemic trust of others	*D*(37) = 0.10, p=.200,
Transformed PHQ9	*D*(303) = 0.05, p=.043*
Transformed Pre-treatment PHQ9	*D*(45) = 0.15, p=.017**

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

Multilevel models were used to investigate the growth curve of depressive symptom severity in individuals with MDD during therapy within an IAPT service, as measured by the PHQ9 across treatment sessions. The data is nested in a two-level hierarchical structure, with session/time at level one and participants at level two. This allowed for the measurement of how depressive symptom severity changes over time, how covariates affect this trajectory and how covariates affect the overall symptoms in treatment. There was a substantial problem with incomplete data because of patient non-compliance with research protocol. However, one of the main advantages of mixed effects models over earlier approaches, such as repeated measures ANOVAs, is that the former are tolerant of missing data (Field, 2018). Mixed effects regressions can make use of all the available data and there is no requirement for equal numbers of observations per participant (Field, 2018). Of course, the possibility of bias resulting from some of the missing data is still present and in a naturalistic clinical dataset such

as this one, it is challenging to interpret such biases as there is inevitable association between those who stay in treatment longer and those who do less well. This creates problems for the interpretation of findings but not for modelling of the data.

An initial mixed multi-level regression model was conducted to analyse the growth curve of depressive symptom severity over sessions/time[1] (linearly), controlling for baseline depression symptom severity using STAT 15 Multilevel Mixed Effects package (StataCorp., 2017. Multiple Imputation Reference Manual, Release 15, College Station, TX:StatCorp LP.). Exploratory analysis revealed no significant quadratic effect of session (the time effect) and so this variable was not used included in the final models. Including random slopes (sessions as a random effect) did not improve the model and caused convergence problems (presumably because of the small sample size) and so this random variable was excluded from the final models. In order to test hypothesis one and two, a second mixed multi-level regression model was conducted which additionally controlled for working alliance. Scores on the epistemic trust for others (ETO) and for therapists (ETT) subscales were then added to the model to explore their relationship to the overall PHQ9 scores. The interactions of scores on both ETO score and for ETT score with sessions/time were then added to the model to explore whether the rate of change of PHQ9 score was affected by these constructs. To test hypothesis three, an additional mixed multi-level regression model was conducted, controlling for initial PHQ9 score, ECRS score and WAI-SR score. PCRS scores, which varied with sessions, were added to this model to explore the association between this variable and overall PHQ9 score across treatment. Finally, to test hypothesis four, interactions between ETO score and for ETT score and overall PCRS score across treatment were added to the model.

[1] As the serial number of sessions also reflects the passing of time without any opportunity to disambiguate the two variables in the study, the variable indicating the serial number of sessions is referred to as session/time throughout. This is to remind the reader that the relationships of this variable with other variables may not reflect the impact of session but may merely show the impact of passing time.

2.4 Results

2.4.1 Descriptive Statistics

The means, standard deviations and ranges of PHQ9 scores per session are outlined in Table 5, including the number of participants who attended each session and completed the measure. The mean PHQ9 score according to session is plotted in Figure 1.

Table 5

The means, SD's, ranges and n for PHQ9 scores

Session Number	Mean (SD)	Range	n
1	13.85 (6.20)	2-27	39
2	12.70 (6.54)	4-27	37
3	11.50 (5.89)	1-25	34
4	10.93 (6.87)	0-24	29
5	10.93 (6.88)	0-24	27
6	10.42 (5.88)	0-26	24
7	9.60 (5.03)	0-21	20
8	7.72 (4.69)	0-21	18
9	7.93 (4.34)	0-17	14
10	6.50 (3.34)	3-14	12
11	9 (3.89)	5-17	8
12	7.17 (4.54)	4-16	6
13	9.50 (7.68)	5-21	4
14	9.50 (6.03)	4-18	4
15	7 (2.16)	3-13	4
16	5.33 (1.53)	4-7	3
17		6	1
18		2	1
19		2	1
20		2	1

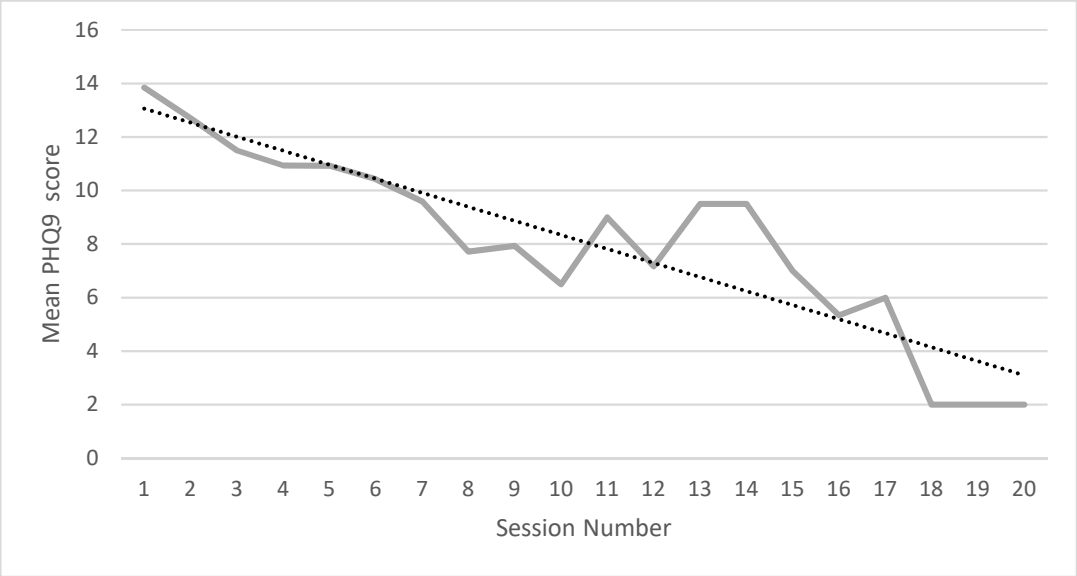

Figure 1

The mean PHQ9 score over sessions/time, with a linear trend line

Table 6 summarises the means, standard deviations and ranges of the time invariant predictors included in the analyses.

Table 6

The means, standard deviations and ranges of the time-invariant variables

Variable	Mean (SD)	Range
Pre-treatment PHQ9	16.53 (5.65)	5-26 [a]
ECRS	30.47 (6.04)	15-44 [b]
ETO subscale	47.21 (9.23)	28-66 [c]
ETT subscale	38.74 (10.98)	17-66 [d]
Number of sessions	6.98 (4.41)	1-20

[a] maximum possible score 27, [b] maximum possible score 45, [c] maximum possible score 84, [d] maximum possible score 84

Tables 7 and 8 outline the means, standard deviations, ranges and sample sizes for the time-varying predictors included in the analyses, including the number of participants who attended each session and completed a PHQ9 along with the other measures.

Table 7

The means, standard deviations, ranges and n of the WAI-SR

Session Number	Mean (SD)	Range	n
1	40.40 (9.99)	34-52	5
2	43.52 (10.38)	21-57	21
3	44.91 (8.44)	34-58	11
4	41.00 (10.66)	23-59	17
5	49.90 (7.20)	32-58	10
6	39.60 (3.86)	23-55	10
7	48.33 (6.95)	38-57	9
8	46.33 (8.93)	30-57	9
9	43.67 (10.40)	25-55	6
10	55.67 (4.04)	52-60	3
11	48.50 (2.12)	47-50	2
12	51.67 (5.77)	45-55	3
13		55	1
14	53.50 (4.95)	50-57	2
15			0
16		48	1
17		53	1
18			0
19		60	1
20		60	1

Note: Total possible score 60

Table 8

The means, standard deviations, ranges and n of the PCRS

Session Number	Mean (SD)	Range	n
1	33.00 (5.61)	27-38	5
2	32.00 (6.33)	19-40	22
3	32.55 (4.97)	24-40	11
4	31.06 (5.69)	21-44	16
5	33.82 (4.54)	28-40	11
6	31.50 (6.74)	22-42	10
7	34.44 (3.81)	29-41	9
8	32.89 (9.02)	19-43	9
9	30.33 (8.70)	18-41	6
10	38.67 (8.39)	29-44	3
11	39.00 (2.83)	37-41	2
12	37.67 (7.57)	29-43	3
13		40	1
14	38.50 (0.71)	38-39	2
15			0
16		30	1
17		41	1
18			0
19		45	1
20		43	1

Note: Total possible score 45

2.4.2 PHQ9 Scores Over Sessions (Model 1a)

A basic model including fixed effects of pre-treatment PHQ9 score and session/time explained a significant amount of variance in PHQ9 scores in treatment, with a Wald Chi^2 statistic of 125.76 significant at the .001 level and a log likelihood ratio of -276.74. Figure 2 shows the predicted values from this model. Due to missing data, only forty-three participants were used in this analysis, with 303 observations (with an average of seven observations per participant). A summary of the coefficients, standard errors, z scores, 95% confidence intervals and associated significance are shown in Table 9.

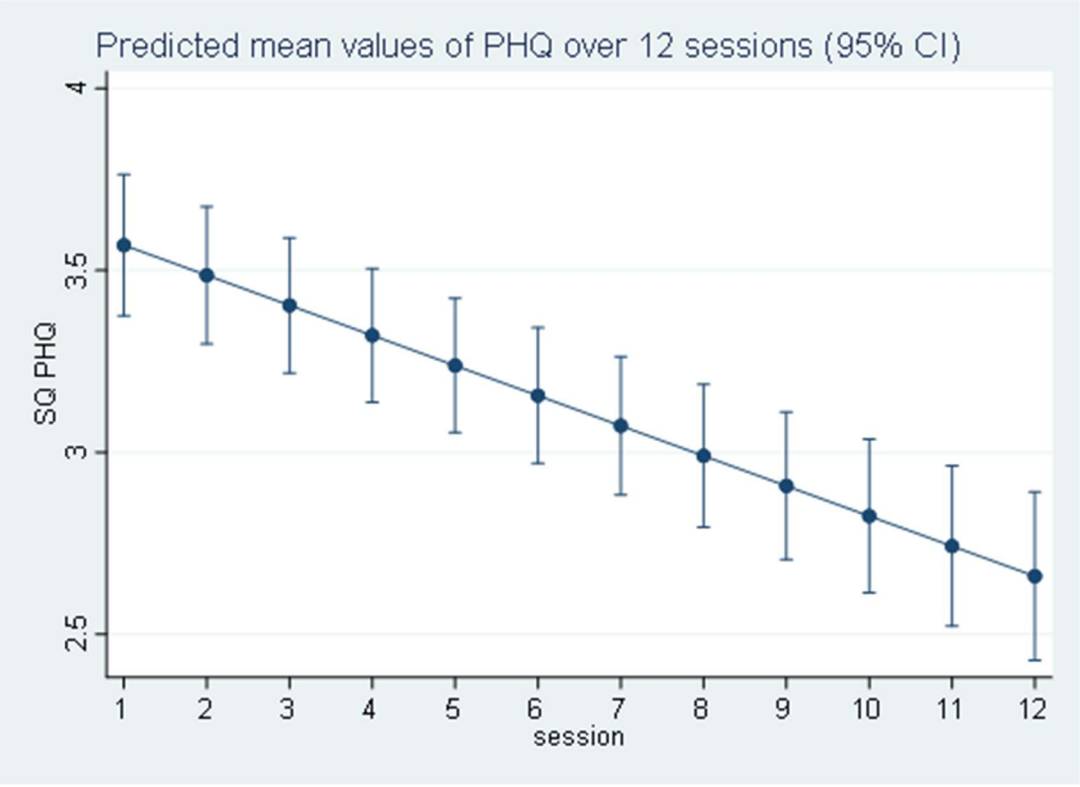

Figure 2

The predicted mean PHQ9 score over 12 sessions (95% CI)

Table 9

Fixed effects parameter estimates of the linear growth model 1a

Predictor	*B*	SE *β*	*Z*	95% CI
Pre-treatment PHQ9	0.698***	0.103	6.76	0.496, 0.900
Session number	-0.083***	0.009	-8.88	-0.101, -0.064

***p<.001

As would be expected, pre-treatment PHQ9 scores had a significant strong positive association with overall PHQ9 scores across treatment. Session/time had a significant negative association with PHQ9 scores. In other words, PHQ9 score reduced over time beyond regression to the mean as we controlled for the effect of initial PHQ9 score. This is depicted in Figure 2. The association between both predictor variables and PHQ9 value appears strong and the confidence intervals relatively narrow.

There was a moderate random effect between subjects, suggesting a difference in intercepts across subjects; the estimated variance at intercept was 0.32, with a standard error of 0.08. This suggests reasonable variability in PHQ9 scores across treatment sessions. As including the random effect of session/time did not improve the fit of the model, it was excluded from the final model under the assumption that the rate of change of PHQ9 scores over time was invariant across subjects in the population once initial value was controlled for.

A likelihood ratio test indicated that this multi-level model was significantly better at predicting PHQ9 scores than a simple linear regression, $X^2(1) = 142.83$, p<.0001.

2.4.3 PHQ9, ETO and ETT Scores (Model 1b)

After controlling for baseline PHQ9 score, WAI-SR scores and session/time, ETO scores and ETT scores were added to the model. This model explained a significant amount of variance in PHQ9 scores in treatment (Wald Chi^2 statistic = 68.62, significant at the .001 level, log likelihood ratio = -85.63), notwithstanding a reduced sample size. Due to missing data, only thirty-five participants were used in this analysis, with ninety-six observations (with an average of three observations per participant). A summary of the coefficients, standard errors, z scores, 95% confidence intervals and associated significance is shown in Table 10.

Table 10

Fixed effects parameter estimates of the linear growth model 1b

Predictor	*β*	SE *β*	*Z*	95% CI
Pre-treatment PHQ9	0.690***	0.126	5.47	0.442, 0.938
WAI-SR	-0.021**	0.008	-2.58	-0.377, -0.005
Session number	0.140	0.126	1.10	-0.109, 0.387
ETO	0.017	0.016	1.04	-0.015, 0.048
ETT	-0.030*	0.015	-2.03	-0.059, -0.001
Interaction of ETO and session/time	-0.007***	0.002	-3.32	-0.011, -0.003
Interaction of ETT and session/time	0.003	0.002	1.59	-0.001, 0.007

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

As in the previous analyses, pre-treatment PHQ9 score had a significant positive association with overall PHQ9 score, although the extent of this lessens when adding WAI-SR score, ETO score and ETT score to the model. This indicates that this association is shared with general dispositional variables in relation to therapy.

As would be expected, WAI-SR score had a significant negative association with overall PHQ9 score. Session/time no longer has a separate significant association with PHQ9 value growth as this change is picked up by other main effects and interactions.

When controlling for these factors, ETO score had no significant association with overall PHQ9 value in treatment, but a significant negative association occurred in the interaction of ETO score with session/time. This suggests that when controlling for pre-treatment PHQ9 score and WAI-SR scores, those with higher ETO values (i.e. presumably lower levels of epistemic trust for others) decreased in PHQ9 score at a slower rate than those with lower ETT values (i.e. presumably higher levels of epistemic trust of others). The predicted PHQ9 score over time based on ETO score is depicted in Figure 3. When controlling for ETO score, ETT score had a significant negative association with overall PHQ9 scores, although this was not moderated by session/time.

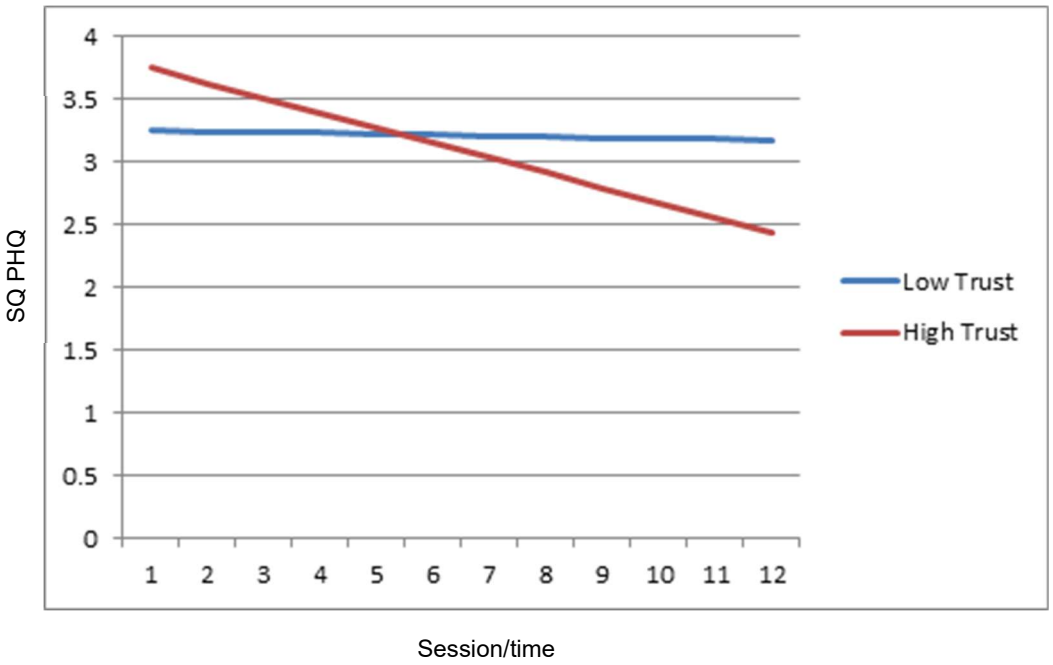

Figure 3

The predicted mean PHQ9 scores over 12 sessions (95% CI) for low ETO scores (high trust for others) (scores <45) and high ETO score (low trust for others) (scores of>44)

The association between ETO score and the rate of change of PHQ9 scores over time appears strong and accounts for additional variance above that of WAI-SR score and ETT score across sessions. The confidence intervals are relatively narrow, suggesting that the actual variance accounted for is unlikely to deviate greatly from the estimated value. The association between ETT score and overall PHQ9 score appears strong, and accounts for additional variance beyond WAI-SR score and ETO score. However, the confidence interval for ETT score is wide, and so the actual variance accounted for could be much smaller that estimated.

There was a moderate random effect between subjects, suggesting a reasonable difference in intercepts across subjects; the estimated variance at intercept was 0.20 with a standard error of 0.08. As including the random effect of

session/time did not improve the fit of the model, it was excluded from the final model under the assumption that the rate of change of PHQ9 scores over time was invariant across subjects in the population once initial value was controlled for.

A likelihood ratio test indicated that this model was significantly better at predicting PHQ9 scores than a simple linear regression, $X^2(7) = 11.83$, p=.0003. The log likelihood in this model improved from model 1 to model 1b. However, this needs to be interpreted with caution as the two models have different sample sizes and so could not be compared statistically with a likelihood ratio test.

2.4.4 PHQ9, ECRS and PSCRS Scores (Model 2a)

Due to missing data for the additional variables added to these models, only thirty participants were used in this analysis, with eighty-seven observations (with an average of three observations per participant). As this analysis is tested on a subsample of the data set used in the models used to test hypothesis one and two, it is not possible to truly test hypotheses three. Nonetheless, the results of the following models are reported to illustrate that the data can be analysed with the model used here, but the estimates obtained cannot truly be considered to be meaningful and so the analysis remains exploratory.

A model of the fixed effects of ECRS score and PCRS scores, controlling for pre-treatment PHQ9 score, WAI-SR scores and session number, explained a significant amount of variance in PHQ9 scores in treatment (Wald Chi^2 = 35.49, significant at the .001 level, log likelihood ratio = -85.04), despite a reduction in sample size. A summary of the coefficients, standard errors, z scores, 95% confidence intervals and associated significance is shown in Table 11.

Table 11

Fixed effects parameter estimates of the linear growth model 2a

Predictor	*β*	SE *β*	*Z*	95% CI
Pre-treatment PHQ9	0.547***	0.142	3.86	0.269, 0.825
ECRS	-0.002	0.023	-0.08	-0.047, 0.043
Session number	-0.071***	0.021	-3.30	-0.113, -0.029
WAI-SR	-0.227*	0.011	-2.03	-0.045, -0.001
PSRS	0.016	0.018	0.89	-0.019, 0.052

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

When controlling for baseline PHQ9 score and WAI-SR scores, ECRS score had no significant association with overall PHQ9 scores. Overall PCRS scores had no significant association with overall PHQ9 score when controlling for baseline PHQ9 value and WAI-SR scores. This could suggest that ECRS and PCRS scores did not significantly affect PHQ9 scores, but inclusion of these variables appeared to create a better fitting model for PHQ9 scores than a simple linear model, or a model including only pre-treatment PHQ9 value.

There was a moderate random effect between subjects, suggesting a difference in intercepts across subjects; the estimated variance at intercept was 0.26, with a standard error of 0.10. This suggests reasonable variability in PHQ9 score at first treatment session. As including the random effect of session/time did not improve the fit of the model, it was excluded from the final model under the assumption that rate of change of PHQ9 scores over time was invariant across subjects in the population when controlling for the initial value.

A likelihood ratio test indicated that this model was significantly better at predicting the rate of change of PHQ9 scores than a simple linear regression model, $X^2(5) = 16.51$, p<.0001. The log likelihood in this model improved from model 1a to

model 2a. However, this needs to be interpreted with caution as the two models have different sample sizes and so could not be compared statistically with a likelihood ratio test.

As stated, the estimates for these variables should not be considered to reflect the true relationship between these variables and PHQ9 score. However, as the log likelihood ratio is relatively small it is unlikely that a larger sample size would yield significant estimates for ECRS or PCRS scores.

2.4.5 PHQ9, ECRS, PCRS, ETO and ETT Scores (Model 2b)

As per the previous model, due to missing data, only thirty participants were used in this analysis, with eighty-seven observations (with an average of three observations per participant). As stated, this analysis is tested on a subsample of the data set used in the models used to test hypothesis 1 and 2, it is not possible to truly test hypotheses 4. Thus, the results of the following model are reported to illustrate that the data can be analysed with the model used here, but the estimates obtained cannot reliably be interpreted. Thus, this analysis is exploratory.

In addition to the previous model, ETO value and ETT value were also controlled for. The interactions between ETO score and ETT score and PCRS scores were added to the model. This model explained a significant amount of variance in PHQ9 score in treatment with the same sample size (Wald Chi^2 =65.89, significant at the .001 level, a log likelihood ratio of -78.94). A summary of the coefficients, standard errors, z scores, 95% confidence intervals and associated significance is shown in Table 12.

Table 12

Fixed effects parameter estimates of the linear growth model 2b

Predictor	*β*	SE *β*	*Z*	95% CI
Pre-treatment PH9	0.650***	0.117	5.54	0.430, 0.881
ECRS	-0.009	0.020	-0.45	-0.048, 0.030
Session number	-0.065***	0.020	-3.29	-0.104, -0.026
WAI-SR	-0.025**	0.011	-2.37	-0.046, -0.004
PCRS	0.061	0.883	0.69	-0.113, 0.234
ETO	0.055	0.055	0.99	-0.053, 0.162
Interaction of ETO and PCRS	-0.002	0.002	-1.62	-0.006, 0.001
ETT	-0.078	0.044	-1.77	-0.165, 0.008
Interaction of ETT and PCRS	0.002	0.001	1.46	-0.001, 0.004

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

The results suggested that overall PCRS score still had no significant association with overall PHQ9 scores. Interactions between ETO and ETT scores with overall PCRS scores had no significant association with overall PHQ9 scores. This suggests that ETO score and ETT score do not impact on the extent of the association between PCRS score and PHQ9 value.

There was a slight random effect between subjects, suggesting some difference in intercepts across subjects; the estimated variance at intercept was 0.10, with a standard error of 0.07. This suggests some variability in PHQ9 score at first treatment session. As including the random effect of session/time did not improve the fit of the model, it was excluded from the final model under the assumption that rate of change of PHQ9 scores over time was invariant across subjects in the population when controlling for the first value.

A likelihood ratio test indicated that this model was significantly better at predicting PHQ9 score than a linear regression, $X^2(9) = 3.09$, p=.0394. The log likelihood in this model improved from model 1a to model 2b. However, this needs to be interpreted with caution as the two models have different sample sizes and so could not be compared statistically with a likelihood ratio test. The log likelihood ratio in model 2b was significantly better than model 2a according to a log likelihood ratio test.

As is the case with the previous model, the estimates for these variables cannot be interpreted. However, as the log likelihood ratio is relatively small it is unlikely that a larger sample size would yield significant estimates for expected and perceived contingent responses or their interactions with epistemic trust.

2.5 Discussion

This paper describes some preliminary analyses exploring the association between ETO, ETT, ECRS and PCRS scores on PHQ9 scores and the rate of change of these scores over sessions/time. Ninety-three adults who were waiting for talking therapies for MDD in IAPT completed thirty-one measures at baseline (three of which were included in the present sub-study). Subsequently forty-six of these participants then completed repeated measures over the course of talking therapy sessions. The result of this study will be discussed in terms of analyses for both pre-treatment ETO and ETT scores and PCRS scores during treatment in relation to PHQ9 scores, and what these results may represent. The limitations and strengths of the study are considered, and the conclusions outlined.

2.5.1 Summary and Interpretation of Results

As expected, PHQ9 scores reduced over sessions/time when controlling for pre-treatment PHQ9 values. Participants did not appear to differ significantly in their rate of change after controlling for this factor but differed somewhat in their intercepts.

2.5.1.1 Epistemic Trust

As predicted, when controlling for initial PHQ9 scores and WAI-SR scores, higher ETO scores were associated with a slower rate of PHQ9 score decline over sessions/time. However, contrary to the hypotheses, higher ETT scores were not associated with the rate of change of PHQ9 scores. Subjects did not appear to differ significantly in their rate of change after controlling for these factors.

These results partially support the ideas proposed by Fonagy et al. (2017), specifically, that a lack of openness to learning through social communication could impede the progress made in therapy. However, the support of the hypothesis is limited because mistrust of information received from therapists specifically did not appear to make any impact on this. Thus, epistemic trust prior to therapy could be a patient related common factor that influences the therapy process. This is congruent with other research that suggests other patient related factors are associated with therapy outcome, including self-efficacy (Schwartz et al., 2018), attachment security (Levy et al., 2018) and patient expectations (Constantino et al., 2011). The implication of this finding could be that developing the client's epistemic trust may be an important part of the therapy process and it may be the case that building epistemic trust is a relational common factor of successful therapies. However, the lack of association of perceived therapist contingency with outcome would argue against such as model. Nevertheless, the findings are consistent with the assumption that those with lower levels of epistemic trust are likely to change less rapidly and arguably benefit less from an intervention based on verbal exchange of information (i.e. learn less from therapy). The conclusion that they need more sessions to recover from depression to the same degree as those with higher levels of trust is a possibility which requires further research.

Interestingly, ETT score was associated with lower levels of PHQ9 scores across the whole treatment when controlling for initial scores of PHQ9. This is the opposite of what was predicted. The finding suggests that for those with lower

expectations of a therapist's ability to understand them and help them in a meaningful way prior to treatment, there was a greater reduction of depressive symptoms associated with the therapy. A meta-analysis found a small effect (*d*=0.24) for patient expectations on therapy outcome (Constantino et al., 2011). The expectancy violation model of nonverbal behaviour (EVT) (Burgoon, 2015) posits that when an individual communicates nonverbally in a manner that is unexpected by the receiver, the individual will likely be evaluated more positively if they were deemed as communicating more positively than expected, and evaluated more negatively if they are deemed to communicate more negatively than expected. This theory has been supported by a number of studies (Burgoon, 2015). One possible alternative explanation for this unexpected result, still broadly within the theoretical framework put forward in this paper, could be that any positive communication displayed by the therapist (such as ostensive cues and contingent responses) was viewed even more favourably by those who expected their communication to be worse compared to those who expectations were better aligned with reality or exceeded it. This could have accelerated the openness to social learning from the therapist in those with lower expectations. However, this is highly speculative and unparsimonious as an explanation and the results may be better explained by characteristics not collected as part of this study. Since this study offers no data to support this theory, this is just postulation.

2.5.1.2 Contingent Responding

Contrary to the predicted outcome, when controlling for pre-treatment PHQ9 value and overall WAI-SR score, neither the ECRS score nor the PCRS scores (controlling for pre-treatment expectations) where associated with overall PHQ9 scores, however these variables explained some additional variance in the scores. This might suggest that contingent responding is not a significant relational common factor in therapies. Additionally, and contrary to prediction, ETO and ETT scores did not appear to moderate the overall effect of PCRS scores on PHQ9 scores during

treatment. The results do not provide support for the notion that contingent responses during therapy are associated with depressive symptomatology during treatment.

It is unclear why ECRS score and PCRS scores had no main effect, but the results do suggest they have some covariance with ETO and ETT scores as the model improved when adding these variables and when including an interaction between these variables and PCRS scores. There was an insignificant interaction between these variables, suggesting that with a larger sample and greater variability of both these parameters an association may emerge. Furthermore, as the models used very small sample sizes that likely led to them being underpowered, it is possible that the effect of contingent responses was too small to be detected. Clearly, further research is necessary, not least on the psychometric properties of both the measures used. It may be that working alliance and contingent responding are closely related and thus contingent responding does not explain much additional variance in depressive symptom severity when working alliance is controlled for. This hypothesis is supported by a post-hoc Pearson's correlational analysis between the mean scores of these variables, which indicated a strong positive correlation ($r(39)=.76$, $p<.0001$). Correlations between two variables that are .80 or above are generally considered to have a high risk of multicollinearity (Field, 2018). As the coefficient for this analysis is very close to this estimate, multicollinearity could be an issue between these two measures (and potentially these two constructs generally).

One aspect of working alliance is the assignment of therapeutic tasks that the client feels are likely to help them achieve the changes they wish to make in their lives. If the client feels the selected tasks are appropriate tasks, the client is demonstrating they have trust in the knowledge of the therapist, which is likely to mean that they feel that the therapist has understood them sufficiently. Therefore, the WAI-SR could be indirectly measuring a sense of being understood by their therapist, just as the PCRS aims to, although the PCRS focuses on this in more depth. This may explain why contingent responses improved the model fit but was not a significant

fixed effect on it's own, especially as both working alliance and contingent responses were measured together throughout treatment sessions. Moreover, a key component of working alliance is building a bond of trust and respect, which is likely to involve feeling listened to and understood, which contingent responses are theorised to do.

2.5.2 Implications for Research on Common Factors

A number of other patient related, therapist related and relational factors have been associated with therapy outcome and are considered common factors to all therapy, including goal collaboration, positive regard, therapist (Laska et al., 2014), patient expectations (Constantino et al., 2011), attachment security (Levy et al., 2018) and patient self-efficacy (Schwartz et al., 2018). As the present study only controlled for the common factor of working alliance and pre-treatment depressive symptom severity, there is likely to be other common factors or covariates that impacted the rate of change of depressive symptomatology that were not measured. These factors could have influenced the relationship between the variables of interest in the study and the overall PHQ9 score and it's rate of change.

As these constructs were not measured and controlled for in the analyses of this study, it is impossible to know whether the inclusion of these variables would alter the associations that ETO, ETT, ECRS or PCRS scores have with PHQ9 score in treatment, although this seems likely given some of the possible conceptual links with the construct of epistemic trust. For example, goal collaboration could be linked to epistemic trust, as it may indicate that the patient feels the therapist's conceptualisation of their difficulties, and thus their solutions to them, are relevant to them, suggesting that they feel understood by the therapist. Moreover, patient expectations could be linked to epistemic trust, as the value and individual places on socially received information is likely to be related to how relevant and useful they expect therapy to be, as this relies on the verbal exchange of information.

Future research into epistemic trust and common factors in therapy needs to simultaneously measure and control for the association between a number of

variables to begin to understand the complex relationship that these variables have with treatment outcome collectively, individually and with each other.

The present findings appear to have potentially identified a patient-related common factor in therapy (epistemic trust in others prior to treatment) that explains variance in treatment outcomes in addition to working alliance (a relational common factor) and initial symptom severity (a patient-related factor). However, the study did not find evidence for a therapist-related common factor (perception of contingency of response from therapist) in therapy success. The findings appear to provide support for the importance of relational common factors, patient-related common factors but not therapist-related common factors. This is somewhat consistent with the literature on common factors in therapy, which have found that patient related, relational factors and therapist related factors each explain variance in therapy outcomes (Constantino et al., 2011; Laska et al., 2014; Levy et al., 2018; Schwartz et al., 2018). However, this is inconsistent with Baldwin et al.'s (2007) findings, which suggest that therapist influence on the therapeutic relationship is associated with therapy outcomes, but that patient influence on this is not. As epistemic trust is assumed to influence working alliance (Fonagy et al., 2014) and contingent responding is assumed to influence epistemic trust (Fonagy et al., 2017), the findings of this study do not appear to support the assertion that patient related factors are not associated with therapy outcome and that therapist factors are.

However, contingency of responses from the therapist was only measured through the perception of the patient. It is assumed that individuals who have lower epistemic trust will be less sensitive to the therapist's contingency and so if this is true, it is unlikely that these patients' perceptions of their therapist's contingency will be accurate. A more reliable way of measuring contingent responses of therapists could be to use an observer-rated scale. If measured using this method, an association between this therapist-related factor may be found as it may measure actual therapist behaviour more reliably.

2.5.3 Limitations of the Study

There are some limitations to the present study that may impact the conclusions that can be drawn from the results found. The limitations are useful to consider when conducting future research into epistemic trust and psychopathology to enhance what is known in this area.

2.5.3.1 Power and Sample Size

Although the literature is unclear, a number of simulation studies suggest that a sample size smaller than 100 at group level in mixed multilevel regression is likely to cause some bias in the values reported in the model. As mixed multilevel models are complex and can vary widely it is difficult to determine the exact effects this could have had on the results observed in this study. However, there is a potential risk of over or underestimation of an effect, or of a model's fit. Therefore, the results in this study must be interpreted with caution and viewed as preliminary in the investigation the impact of epistemic trust on depressive symptoms. This is particularly true for model 2a and 2b as they did not find an effect of perceived contingent responses on depressive symptoms. It may be that a type II error occurred, and an actual effect was missed. Since no studies to date have investigated the role of epistemic trust in psychopathology in which the present results could be compared with, this can only be speculated. Future research should investigate the relationship between ETO, ETT, ECRS, PCRS and PHQ9 scores on a larger sample to adequately test the null hypothesis with more confidence and accuracy.

2.5.3.2 Measures Used

The measures used to determine to key constructs of interest in the study, namely epistemic trust and contingent responses, are all new scales that are still under development and to date are untested for their psychometric properties. This means that any results gathered in the study must be viewed sceptically, as the effects found in the study to be significant or non-significant may not reflect a true relationship between the intended constructs as the measures used may not accurately quantify

them. The present study provided some preliminary data which suggests that the internal consistency of the ETS, ECRS and PRCS are good. However, the study did not provide any evidence for other types of reliability or validity of the measures. It is unclear whether these scales actually measure what they intend to. As discussed, it may be possible that the WAI-SR and the PCRS may overlap in the construct(s) measured by the scales. Thus, the content validity of the PCRS may be questionable. The construct of epistemic trust for others is very broad, concerning any other person, whereas the construct of epistemic trust for therapists is incredibly narrow and specific. These categories may not accurately reflect the possible variation in epistemic trust for people who serve different roles in an individual's life, such as family, friends or figures of authority. As there are currently no alternative validated measures of epistemic mistrust or contingent responses, future research should explore the validity of the aforementioned measures and repeat the study with any revised measures that are created as a result of this testing.

Additionally, the ETS, ECRS, and PCRS have no "cut off" score for what is considered "low" and "high" values as the measures have not yet been tested on a normative sample. This limits the conclusions that can be drawn from any findings made when using them. As depicted in Figure 3, the predictive mean scores over sessions/time were calculated and compared between those with "high trust" for others (lower ETO scores) and those with "low trust" for others (higher ETO scores). However, the creation of these categories were based on the arbitrary parameter of splitting the total possible score on the subscale in half. How these category parameters are defined may affect the differences in predicted trajectory of symptomatology over time.

Additionally, the study did not measure whether the differences in the trajectories between those with higher or lower levels of epistemic trust for others were of clinical significance. The PHQ9 (Kroenke, 2012) denotes that a clinically significant reduction in symptoms is reflected in a total score reduction of five points

or more. It may be that although the rates of change of depressive symptoms differed between people scoring higher or lower on the ETS, this does not equate to anything of clinical important, and thus the treatment would not need to be adapted to accommodate this. Future research could investigate the true significance of this difference in trajectories by ensuring a complete data set which includes the final treatment outcomes for all participants, which this study did not. Ensuring data on outcome at treatment completion would also allow for firmer conclusions to be drawn about the impact epistemic trust has on response to treatment overall as well as over sessions/time. This could allow for clearer recommendations to be made regarding treatment, such as whether those with worse trust for others need a greater of number of sessions to recover than those with better trust.

2.5.3.3 Generalisability

Some features of the sample used in the study should be taken into consideration when interpreting the results. Firstly, this study only looked at individuals with MDD treated largely with CBT and so any findings in this study cannot be generalised to other disorders or treatments. It may be that the relationship between epistemic trust and contingent responding differs across mental disorders and therapies. Future research could benefit from exploring the role epistemic trust plays in the treatment of various psychopathologies.

It may also have been the case that some participants were taking antidepressant medication alongside their therapy, as a combination of pharmacological and psychological treatment is a recommended treatment (NICE, 2018). The combination of these treatments may have impacted on the outcome of therapy and subsequently influenced the observed trends in therapeutic progress. This should be controlled for in future research.

Secondly, this study only looked at individuals seeking treatment in primary care of two NHS trusts, which does not offer support to individuals with chronic, complex and comorbid difficulties outside of certain localities. This means that no

inferences can be made about the relationship between epistemic trust and more severe presentations of depression, or cases of depression across the country. Although there was a good range of PHQ9 scores included in the study, a sample that is solely sourced from primary care will inevitably represent less severe and less persistent presentations of the disorder than a sample that also includes individuals sourced from secondary care. Furthermore, it is reasonable to assume that if an individual has very high levels of epistemic mistrust, that they may not seek out or engage in therapy services as their mistrust for socially received information is so severe that they would see no value in therapy at all. This limits the generalisability of any findings. Future research should consider sourcing samples from both primary and secondary care services.

In the present study, there is a lack of individuals reporting the highest possible scores on the measure of epistemic trust. In conducting analyses on a data set that did not include the full range of possible values for ETO and ETT we may be missing the true nature of their relationship with PHQ9 score in treatment. This is particularly true considering that the ETS does not currently have a "cut off" for high and low epistemic trust. Future research should use a sample that includes a full range of ETO and ETT scores to understand this relationship more broadly.

Additionally, the sample size includes a disproportionately larger number of females, which is expected considering females are more likely to seek treatment for depression than males are (Angst et al., 2002). Males and females experience the various symptoms of depression differently, such as females being more likely to feel tearful and males are more likely to be in paid employment while depressed (Angst et al., 2002). Thus, there are limitations to the generalisability of the results to all individuals with depression.

Finally, there were a number of "drop-outs" at various stages of the study. Only limited exploration of the characteristics of drops outs was possible as these participants provided very little data prior to leaving the study. Although there were

some differences between the characteristics of those who dropped out and the study sample (namely pre-treatment PHQ score, age, gender, ethnicity, household income and employment status) none of these were found to be statistically significant. However, these individuals may have differed in other potentially meaningful ways to those participants that remained in the study, which may have caused bias in our sample and results. It is not clear whether these individuals only dropped out of the study or if they also dropped out of their treatment in the IAPT services. It would be reasonable to expect that those with high levels of epistemic mistrust for others may see little or no value in therapy and so this may be the very reason these individuals do not begin or continue sessions, or indeed, the study. Due to a lack of data on the epistemic trust of those who dropped out, it was not possible to examine this in the present study. Thus, further analysis of the participants who left the study prematurely may tell us something of interest about the relationship between epistemic trust and therapy process or outcome. Future research may benefit from including such analysis procedures in their design. This may require collecting data on epistemic trust as early as possible in the study protocol. As the present study was part of a larger study, participants were typically asked to complete the ETS after a number of other measures, making it more likely that those who drop out of the study prior to starting therapy would not have provided this data. Future research may benefit from prioritising the completion of this measure earlier on in the study protocol.

Additionally, the present study had a 15.4% drop out rate as well as some missing data due to participant non-compliance with the study protocol. Missing data and “drop-outs” are not unusual in longitudinal research (Rajulton, 2001). However, Hoerger (2010) found that the initial drop out rate of student participants in an internet-based survey was 10% with an additional 2% drop out found with each 100 items the participants were required to complete. This is likely to have an even greater impact on the current study due to the common symptoms of MDD including lack of motivation and lack of energy (American Psychiatric Association, 2013). Although no

statistically significant differences were found between pre-treatment PHQ scores, it may have been that participants who were more functionally impacted by their depressive symptoms were more likely to drop out of fail to follow the study protocol, introducing possible bias into the study sample. Future research may benefit from significantly reducing the number of measures participants are required to complete to improve data completeness and representativeness.

2.5.4 Strengths and Impact of the study

Despite the limitations of the current study, it provides the first preliminary investigation into the possible relationship between openness to social learning and the treatment of psychopathology to date. The study offers some suggestive results of potential clinical significance regarding the course of treatment for depression, which indicate that further exploration of these constructs may be warranted. If epistemic trust prior to treatment is a significant patient common factor in therapy outcome, it would be useful to measure this and take it into account when considering what treatments are offered, by which therapists, for how long and using what therapeutic techniques. For example, if the findings here were to be replicated it could be argued that as IAPT services usually only offer 10-12 sessions of CBT for depression, whilst 20 is recommended by NICE guidelines (2018), outcomes for some people could be improved by lengthening therapies. 10-12 may not be a sufficient number of sessions for someone with low epistemic trust of others to recover and adapting the treatment may be necessary to promote recovery. Moreover, if the findings were replicated, they may inform the skills therapists need to develop, what they should focus on in their sessions and how they can conceptualise and measure progress and barriers to it. Such conclusions or recommendations of course cannot be made on the basis of this study without further investigation in more robust and larger scale studies which may be able to offer some useful recommendations to existing clinical practice.

This study provides some initial pilot data on the reliability of new measures of epistemic trust and contingent responses that can inform future studies exploring their psychometric properties. The results of this study may stimulate interest in the theory of epistemic trust and encourage further research which can improve measurement of the constructs and explore whether the present findings can be replicated and/or extended.

The use of a mixed multilevel analysis allowed for the exploration of both between and within participant effects, allowing a more thorough understanding of the trends in PHQ9 scores. The model allowed for the measurement of the impact of a number of variables, both on their own (when controlling for other factors) and collectively, which helps create a richer and truer picture of the impact epistemic trust and contingent responding may have. Although the models in present study were almost certainly underpowered, they demonstrate an effective way to examine the process of change in therapy, which Cuijpers et al. (2018) highlights is vital in beginning to build an evidence base as to how therapy works and how common or specific factors influence it.

2.5.5 Conclusions

The present study found results that are suggestive of a possible relationship between epistemic mistrust for others and the rate of improvement across primary care psychological therapy in individuals with MDD, but not for epistemic mistrust specifically for therapists. Contrary to what was hypothesized, epistemic mistrust for therapists was associated with less overall depressive symptomatology in treatment. Due to a limited sample size and the use of untested measures in the study, the results should be viewed as preliminary and exploratory, although are suggestive of a need to further investigate the role of these constructs in psychotherapy. Future research should initially focus on validating the measures of epistemic trust and contingent responding and replicating the current analyses with a larger sample size to investigate the relationship between these variables with more confidence.

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Part 3: Critical Appraisal

3.1 Introduction

This critical appraisal considers some of the conceptual and practical issues encountered and insights gained during this research study and systematic review. This includes the challenges of working within a large research team and with the NHS, the methodological and practical issues in the study design, my experience working with individuals with depression and finally my reflections on conducting research in an area with a limited evidence base. Lastly, I briefly draw some conclusions from the appraisal.

3.2 Conducting Research in Wider Teams

3.2.1 Working Within a Larger Project

The present study was conducted as part of a larger project examining a variety of different variables and their association with major depressive disorder (MDD). My role within the team was primarily to manage the collection of measures at baseline and after therapy sessions (via POD), but I was also involved in recruitment to the study and in ensuring participants completed all elements of the larger study. This involved me holding multiple agendas and priorities in mind simultaneously, which was quite challenging at times. However, it gave me the opportunity to understand the study in it's entirety, which enabled me to identify and manage problems that arose in any part of the larger study. For example, it enabled me to identify that initially all the referrals from the NHS trusts were of participants who had only recently been placed on a long waiting list for IAPT treatment, meaning that they were unlikely to complete the therapy before data was analysed, leading to higher than expected levels of missing data. This gave me the opportunity to problem solve and liaise with members of the research team and involved agencies to discuss and offer solutions to such issues. The challenges of this were ensuring that all members of the research team were cohesive in their approach to the barriers encountered. Additionally, it was important that I communicated the aims and needs

of my sub-project with the wider team effectively to ensure the project ran as smoothly as possible. This was challenging as most communication with the wider project team and NHS trusts was via email, sometimes making it difficult to quickly resolve any issues that arose. This emphasised to me the need for frequent and effective communication between members of a research team, particularly when they work remotely.

3.2.2 Recruiting through the NHS

NHS trusts have research and development teams that work across services to manage, coordinate and oversee all the research being conducted with patients in the services. The research team of the current study was located outside of the NHS, but the research and development teams of the trusts sent referrals of patients that were interested in participating in the study. The research team would then contact them to discuss the study further and seek consent from the individuals. The NHS trusts agreed to send a certain number of referrals to the research team each month, based on what was manageable given their resources. This posed some challenges for the study. It was not unusual for a number of the referrals sent through each month to be uncontactable, decline consent or simply lose contact with the study team. Due to the time-limited nature of the project, this severely impacted the number of participants who were successfully recruited to the study. Although more referrals were needed, it was important to balance this with maintaining a good relationship with the research and development teams in the trust, as placing additional pressure on their limited resources may have resulted in the trusts having to disengage entirely from the study. Additionally, the study team itself had limited resources, and as following up with participants throughout the course of their therapy (required for the repeated measures aspect of the study design) was very labour-intensive, the research team was also limited in the number of new participants they could successfully manage at any given time.

In the first two months of recruitment, it became clear that the trusts were only sending referrals of patients that had very recently had their assessments in the service and so had at least three months until they began therapy, which in itself could last up to five months. This was problematic as a number of these individuals were unlikely to begin therapy by the end of the study, and many would not have attended many therapy sessions by the time data was analysed. This problem was highlighted to the trusts and more suitable referrals were sent following this. However, this meant that recruitment was slowed even further and a number of participants entering the study were not eligible for the data analysis. The highlighted to me the difficulties in having another institution "gatekeeping" recruitment. This may mean the aims and requirements of the study are not clearly communicated to other organisations and that problems that arise in the study may take longer to resolve as the research team themselves are not responsible for managing all aspects of the study.

Another challenge of this arrangement with the trusts was that the research team did not have access to the clinical data systems used by the IAPT services and so some data for the analyses had to be requested from the research and development teams. As the research and development teams are involved in a number of research projects, this led to delays in obtaining data that was required for analysis. This emphasised to me the importance of organisation, planning ahead and communicating a clear schedule when managing a research project. This is particularly useful when a number of teams or institutions are working together on research, as their schedules and resources may widely differ. It would have been useful to have a clearer study schedule early on in the project that could be disseminated to the team and other agencies involved in the study to minimise delays in the project. However, this was not possible due to a number of challenges that meant there was a lot of uncertainty in the project's progression with regards to achieving a sample size that had been established by power calculations.

3.3 Methodological and Practical Issues

3.3.1 Managing Funding

Shortly before data collection was due to commence the research team unexpectedly lost some funding which made it impossible to continue with the study in it's original incarnation. The larger research project was held in a research centre and participants were invited to attend the centre, complete all the measures of the study and be reimbursed for their time and travel expenses. However, this was no longer feasible. This required myself and the research team to redesign aspects of the study promptly to minimise the delay to data collection, considering which elements of the study could be removed or adapted to narrow the scope and minimise the cost of the project. This meant tolerating a lot of uncertainty in the future of the project and having to delay the project while waiting for approval from project leads and the ethics committee. In addition to having less time to recruit participants, this resulted in the study being redesigned to be completed online, with contact with participants made over the telephone or via email. This introduced some limitations to the study which ultimately impacted on participant recruitment, as well as shortening the amount of time I had for data collection (as well as potential recruitment bias, which was difficult to account for statistically due to a lack of data on those patients not enrolled).

This experience impressed upon me the impact that funding has on research and the fragility of it. I reflected on the power that funding bodies have on what research is conducted and how it is conducted and how this may be at odds with the goals of researchers. This also highlighted to me the need for adaptability in research and the importance of having a "plan B". This gave me an opportunity to think about the multiple ways a research question can be addressed and the associated costs and benefits of these approaches. This also made me reflect on the challenges of conducting research within a short time scale, and how many other factors can impact upon the schedule you have planned for a project.

3.3.2 Longitudinal Designs

One of the widely known challenges of longitudinal research is managing "drop-outs" across time-points in the study, particularly if these time-points are far apart, which leads to missing data (Rajulton, 2001). This was a significant problem with the present study. Due to delays in beginning recruitment and the short time-scale of the project, it meant that a number of participants had not completed therapy when data was analysed, which could be viewed as missing data. As the study was not examining treatment outcome but the process of change in treatment, this was not necessarily an issue providing participants had completed at least two sessions of therapy so within-subject changes could be analysed (to which some had not). Moreover, a number of participants did not follow study protocol, which resulted in them completing measures at differing time-points to one another. To minimise the impact of missing data during therapy a multilevel model analysis was chosen as this method of analyses is robust against missing data in "clusters" of nested data (Field, 2018).

Additionally, Rajulton (2001) also points out that there are a number of factors that may influence any change observed over time than the function of time itself, and so there are difficulties in establishing causal relationships. This may be true for the present study, as for example, the differences in the growth curves of individuals with higher and lower epistemic trust may be due to other unmeasured and uncontrolled factors. However, a longitudinal design did allow for the examination of the process of therapy, for which Cuijpers, Reijnders and Huibers (2018) state is vital in developing an evidence base that can begin to answer the question of *how* factors influence therapy, rather than simply acknowledging that they do through correlational research.

3.3.3 "Remote" Studies

There are additional challenges to studies completed entirely online. Internet users may differ from those who do not use the internet. The U.S. Department of

Commerce (2002) cited in Kraut et al. (2004) found that internet users are more likely to be young white adults. The use of computers and the internet may have made the study less appealing for some individuals, such as ethnic minorities or middle aged and older adults. This may have explained why some people dropped out of the study, although without analysis into the characteristics of participants who dropped out, this cannot be determined. However, if this were found to be the case, it might be useful to consider having alternative methods for participating in the study available to participants to choose from, such as coming into research centres or posting paper copies of measures back to the research team.

Despite these challenges, remote studies reduce participant burden as they do not require participants to travel to research sites, which in turn reduces the cost of the study as travel is usually reimbursed (Kraut et al., 2002). Furthermore, the online data system (POD) allowed participants to complete the measures at their own pace, giving participants flexibility in how they participated in the study. Some researchers have expressed concerns that characteristics of the environment in which online questionnaires are completed (such as distracting environments) can affect the reliability of results. However, Riva, Teruzzi and Anolli (2003) compared responses from online and paper versions of questionnaires and found no differences in the psychometric properties of these modalities.

3.4 Working with Participants

3.4.1 Working with Individuals with MDD

There were some challenges in working with individuals with MDD. One of the main symptoms of MDD is a lack of motivation, tiredness and little energy (American Psychiatric Association, 2013). This may have affected their engagement with the study. The study required a substantial amount of participants time (around three hours for all components of the larger study) that was spread across a number of weeks, sometimes months. A number of participants dropped out at various stages of

the study, resulting in a lot of missing data. It was common for participants not to respond to contact, even if they remained in the study, resulting in data being completed at varying session numbers. This is a common problem in longitudinal research (Rajulton, 2001) and with “remote” studies (Kraut et al., 2002) but this may have also been in part due to working with individuals where inactivity and avoidance of social contact is a symptom of their diagnoses. A recent systematic review identified symptoms such as low motivation as a reported barrier to participant engagement in research (Hughes-Morley, Young, Waheed, Small & Bower, 2015). Upon reflection, in order to reduce “drop-outs” and missing data, it would have been beneficial to reduce the participant burden by reducing the number of measures they are asked to complete. Although there are benefits to collecting a large and comprehensive data set, this should be minimised as much as possible for this particular group. It may have also been beneficial to recruit participants who were due to commence therapy in two or three weeks, to minimise the amount of time they are involved in the study. Additionally, it would have been useful to have co-created the study with service users whose experience with depression could be invaluable in designing a study that is both informative and manageable for participants with these difficulties.

3.4.2 The Role of Researcher

A number of participants in the study asked me questions or voiced frustrations about their treatment, namely regarding the waiting times for therapy. This suggested to me that despite explanations from the research and development team and the study team, the division between the researching institution and the treating institution was not clear to participants. As I was regularly contacting participants to enquire whether they had been given a start date for therapy (in order to schedule when they would complete the next measures in the study), it often meant I was in more frequent contact with them that the IAPT services, and so it seemed natural that participants would approach me with such questions. As I was not part of the IAPT teams, I was unable to answer any questions, and could only advise participants

contact the IAPT service themselves. As the majority of communication following consent was via email, it was challenging to respond to these concerns sensitively and to ensure that the differences between the two services was communicated clearly. These challenges made me reflect on the differences between the role of clinician and researcher and the difficulties in switching between these roles as a Psychologist. It also made me consider how confusing it may be for clients involved with clinical and academic institutions to understand how they work and subsequently who serves what role within them. It is important that this information is given clearly to participants prior to consenting to participate, both verbally and via the participant information sheet. Upon reflection, it may have been helpful for service users to co-create the participant information sheet and help the researchers think about how they explain the service structures to participants. As individuals outside of the "systems" involved in the research, service users could provide a valuable perspective and identify ways to increase clarity for participants.

3.5 Conducting Research on an Emerging Topic

3.5.1 Clinical Experiences and Empirical Research

When conducting the systematic review, I was surprised by the lack of studies comparing loneliness in healthy controls and those with psychopathology. I was also surprised that epistemic trust, a concept that had been discussed in academia for some time, had not yet been researched in mental health, and that an established measure did not yet exist. From my experience as a clinician, the connection between the two constructs and psychopathology seemed clear to me and was something I believed I had observed (although had not formally measured) frequently in clinical practice. It therefore surprised me that this connection had not been empirically tested more frequently. This led me to reflect on why this may be the case. Current research into the treatment of psychopathology tends to focus on what therapies work (i.e. treatment models or protocols) rather than understanding how they work and what

the process of successful therapy involves (Cuijpers et al., 2018). What had drawn me to research the concepts of loneliness and epistemic trust was my own clinical experience and a sense that the theories around the construct appeared to align with my own experiences with clients. As many Psychologists tend to either practice clinically or as a researcher, and it is unusual that they will have a significant role in both areas of Psychology simultaneously, it made me consider the differences between research of academic significance and clinical significance. This impressed upon me the need for clinical practice and empirical research to inform one another and for research to ensure it can encourage progress in clinical practice and that it addresses the questions that would be necessary in order to do this.

3.5.2 Researching an Untested Concept

I found conducting research in an unexplored area exciting, as it felt like the study could begin to shed light on some answered questions in the topic area. However, this posed some challenges as a researcher. Firstly, there were no other similar studies whose results could guide my hypotheses or inform my project design. It also made interpreting the results of the study difficult as there are no other closely related findings in which they could be compared. Another challenge was on relying on measures of concepts that were new and untested. As the validity of these measures are unknown, it places additional uncertainty on the findings of the study. It also meant that there was limited guidance in the use of these measures, for example, the Epistemic Trust Scale (ETS) (Luyten, under development) did not have a defined “cut off” score for low and high levels of epistemic trust. This made interpretation of the results additionally restricted as this limited the significance that could be assigned to any given value on the measure. In the study a comparison of the rate of change of those with “low” epistemic trust and “high” epistemic trust was represented graphically to illustrate the impact of epistemic trust on the growth curve of depressive symptoms, but the assignment of these categories was based on halving the maximum score on each subscale of the study, which was arbitrary.

Given the limitations of the design and the lack of similar research, the results can only be considered as preliminary and it might be best to think of the study as a pilot study for the new measures and the role of epistemic trust in psychotherapy outcome. This seemed somewhat anticlimactic and emphasised the need to be pragmatic about the findings of research and to view the results from a detached, critical perspective. This could be difficult if a lot of work has been placed on the project or if the topic is one that the research has great passion and interest for. I found it more challenging to critique the findings of the empirical study compared to literature review and I think this may be because of the "distance" I had from the results of the reviewed studies compared to one I was conducting. It also reminded me that it is often the case that research opens more questions than it can answer. This was particularly true for the systematic review, for which the findings suggested a relationship between loneliness and psychopathology, but the true nature of this remains unanswered, limiting how this information can be used practically in mental health.

3.5.3 The Future of Epistemic Trust and Loneliness

The results of the meta-analysis suggest that loneliness could be a common experience across a number of psychopathologies. However the scope of the review does not allow for exploration of the nature of this association. Theories suggest the association could be bidirectional and current research provides evidence of loneliness preceding and following mental disorder, but research is yet to elucidate the exact temporal relationship. The results suggest the clinical value in researching this further. The findings of the empirical paper suggest that epistemic trust could influence progress made in therapy, although these findings are in the context of using an untested measure and a small sample size. Despite the limitations of the study and the preliminary nature of the findings, they have already stimulated further research into the relationship between epistemic trust and therapy outcome. The wider research team in which I conducted the study have agreed to continue collecting

the data obtained in the present study to eventually investigate the research questions with a larger sample size. This reminds me that no study can have a “perfect” design and that even a flawed study can impact the course of research and what is known about a particular field. It also made me consider the need to assess the value of conducting a study given the resources it would require. Specifically, that allocating a large number of limited resources to conduct a large study on a previously untested area may not be seen as a valuable use of resources as the findings may not offer anything useful to the field. Conducting smaller scale, and less robust studies may be a pragmatic way to test the possibility of useful findings. This can indicate whether there is value in conducting further research. This seems reasonable given the limited resources available to psychological research.

3.6 Conclusion

In conclusion, there were a number of challenges in conducting this research and I was struck by the impact that practical issues, such as funding can have on a project. This has helped me to develop an awareness of the many influences on research and impressed upon me the need for excellent organisational skills, cohesiveness across all members of a research team and the benefits of having “plan B”. In conducting this research, I gained valuable experience in responding promptly and flexibly to unexpected challenges and in considering different research designs to answer a research question. I encountered a number of dilemmas in designing the project and this reminded me of the imperfections that are inherent in any research design and the impossibility of creating an unflawed project. This experience also made me aware of the many external influences that can impact upon a project and the limited control a research team can reasonably have over these, making research an uncertain and changeable endeavour that works best when professionals and service users work together with a shared agenda to create the most feasible, relevant and methodologically sound project possible. Despite the limitations to the findings of

the empirical paper and meta-analysis, the empirical paper has already stimulated further research, which could lead to interesting and promising discoveries. The research study is not robust enough to influence clinical practice, but the results have the potential to influence academia through stimulating interest and improved exploration of the research question. This highlights to me the need for replication and extension of research to begin to draw conclusions and that one study alone cannot be relied upon make any substantial claims.

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Appendices

Appendix 1

Email of Ethical Approval for Study Amendment (for the present sub-study)

IRAS Project ID 161423. HRA Approval for the Amendment

DELETE REPLY REPLY ALL FORWARD

AMENDMENTS, Hra (HEALTH RESEARCH AUTHORITY) <hra.ame Mark as unread

To: p.fonagy@ucl.ac.uk;

Cc: randd@uclh.nhs.uk; Judy.leibowitz@candi.nhs.uk;

Dear Professor Fonagy

IRAS Project ID:	161423
Short Study Title:	Major Depressive Disorder (MDD)- a computational neuroscience approach
Amendment No./Sponsor Ref:	Amendment 3 (Substantial), 10/05/2018
Amendment Date:	29 May 2018
Amendment Type:	Substantial Non-CTIMP

I am pleased to confirm **HRA and HCRW Approval** for the above referenced amendment.

You should implement this amendment at NHS organisations in England and Wales, in line with the conditions outlined in your categorisation email.

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 procedure. If you wish to make your views known please use the feedback form available on the HRA website: http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/.

Please contact [hra.amendments@nhs.net]hra.amendments@nhs.net for any queries relating to the assessment of this amendment.

Kind regards

Mrs Kirsten Peck
HRA Approval Amendment Coordinator
Health Research Authority
Ground Floor | Skipton House | 80 London Road | London | SE1 6LH

Appendix 2

Consent Form

BACK

Measure Input

MDD - CPA Consent Form : MDD - CPA Consent Form

Completer:	Patient	
Date:		

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Project Title: Probing Social Exchanges – A Computational Neuroscience Approach to the Understanding of Major Depressive Disorder – A reduced sub-study

Thank you for your interest in taking part in this research. Before you agree to take part, the person organising the research must explain the project to you.

If you have any questions arising from the Information Sheet (version 1.0, 10th May 2018) or explanation already given to you, please ask the researcher before you to decide whether to join in. You can request a copy of this Consent Form to keep and refer to at any time.

Please initial the statements below if you agree with them:

q1 **I have read the notes written above and the Information Sheet dated May 10th 2018 (version 1.0), and understand what the study involves. I am also aware that I can consent to certain aspects of the study in order to participate in them whereas I can withhold my consent for others parts.**

Yes	No

q2 I understand that if I decide at any time that I no longer wish to take part in this project, I can notify the researchers involved and withdraw immediately.

Yes	No

q3 I consent to the processing of my personal information for the purposes of this research study.

Yes	No

q4 I understand that such information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.

Yes	No

q5 I agree that my test results can be held by the Wellcome Trust and shared with other research groups, and I understand that this data will be anonymous and not contain any personal information.

Yes	No

q6 I understand that some of the data will be transferred for analysis to the Principal Investigator's second laboratory at Virginia Tech University in the USA and will therefore no longer be subject to EEA data protection laws but that this data will be anonymised and no identifiable personal information will be shared or transferred.

Yes	No

q7 I agree that my non-personal research data may be used by others for future research. I am assured that the confidentiality of my personal data will be upheld through the removal of identifiers.

Yes	No

q8 I understand that the information I have submitted will be published as a report and that I can request a copy. Confidentiality and anonymity will be maintained and it will not be possible to identify me from any publications.

Yes	No

q9 I agree to be re-contacted in the future by the researchers in case that additional data has to be obtained or for follow-up studies.

Yes	No

q10 I agree that my GP can be told that I am participating in this study.

Yes	No

a. GP Name

Surgery

b. Address

Appendix 3

Participant Information Sheet

MDD – CPA

Major Depressive Disorder – a Computational Psychiatry Approach

Version 1.0, 10/05/2018

[Information Sheet for Sub-Study; Clinical Services]

Understanding the Social Brain in Healthy Volunteers and People with Psychological Difficulties – Reduced Sub-Study

We would like to invite you to participate in this research project.

You are being invited to take part in a research study. You should only participate if you want to. Before you decide whether to take part, this sheet will give you some more information about why the study is being carried out, what you would be asked to do if you decide to take part, and how the study will be conducted. Please take some time to read this sheet, and to discuss it with other people if you wish. You are also very welcome to ask any further questions about the study, or if you find anything on this sheet unclear.

Why is this study being done?

With the proposed project we plan to investigate social interaction styles/behaviours and personality/character traits in people suffering from Major Depressive Disorder and compare them with healthy control participants. Our study design will aim to address some of the gaps in current knowledge and investigate whether there is a relationship and if so, whether social behaviours can be predicted or modelled using personality/character traits. This will hopefully allow us to gain a better understanding of the disorder and contribute toward developing more informed and effective treatments from which clients will benefit.

Why have you been invited to take part?

You have been invited to take part in the study because you have recently been assessed by a clinician at one of the clinical services currently in collaboration with the research team.

Do I have to take part?

No. Taking part in the study is entirely voluntary. It is your choice whether or not you would like to participate. Deciding not to take part in the study will not affect the care you receive from services either now or in the future. If you do decide to participate, you will be given this information sheet to keep, and you will later be asked to sign a consent form stating that you wish to take part. If you do give consent to take part in the study, you are still free to leave the study at any point, without giving a reason. This will not affect the care you are currently receiving, or will receive in the future. If you leave, any information that we have already collected from you will be destroyed.

What will happen if I decide to take part?

If you wish to take part in the study, then you can get in touch with the research team or provide your contact details so that we can arrange a time to discuss the study in more detail. The researcher you will speak to will also explain that the study can be completed online via the Internet and they will explain the use of the online platform(s) which host the study components (described in more detail below). You can ask any questions or address any concerns you may have. If you decide to take part, you will be given access to the online platform(s). Once you have accessed the online platform(s), we will ask you to provide written consent that you agree to take part in this research study.

There are two main components in this study: computerised, cognitive game(s) investigating social interaction/behaviour and a series of self-report questionnaires assessing personality/character traits, developmental history and symptomatology. Some questionnaires are sensitive in nature and include questions regarding childhood experiences. You will also be asked to provide some demographic information about yourself. The self-report questionnaires usually takes ca. 1-2 hours to complete and you can save your progress in order to take breaks in between questionnaires if required.

The computerised, cognitive task(s) will involve responding to written cues using different keyboard buttons to estimate or compare different events or conditions (similar to simple computer games). In some of them, you will play another person who is also playing the game in a different location. We will make sure that you understand all aspects of the task(s) before you are asked to play them, and we will provide you with reminders of the instructions immediately prior to the task beginning. There will also be opportunities for you to ask any questions if you are uncertain about the instructions or task(s) in general. This component will take between 30 and 45 minutes. Most people find the test(s) quite straightforward and interesting to do.

All identifiable information will be removed prior to you completing the study.

No part of the study is compulsory and there will be separate consent sections for each part of the study.

We do encourage you to discuss these details with the research team when they contact you over the phone in order to make sure that you fully understand them and that your concerns and questions can be addressed.

What are the possible disadvantages and risks of taking part?

Some people can find it upsetting to answer questions about their personal experiences. We will support you if you become upset. A specific Risk and Safety protocol for this study has been developed. You will be given time at the end of the study to be fully debriefed with a member of the research team and provided with information on emotional regulation skills, and crisis phone numbers and details of clinical services to contact. Your personal therapist will also be aware of your participation in the study and able to support you should you find discussing your experiences difficult. Should you feel overwhelmed or acutely distressed during or at the end of the assessments, you will be appropriately looked after by an experienced clinician.

What are the possible benefits of taking part?

You may find it interesting to complete these tasks and the information gathered during this study will also help to inform our understanding of treatment for Depression, which will hopefully be a step towards helping improve interventions in the future.

Will I be paid for taking part in the study?

As an acknowledgement of your time, we will be offering you a flat rate of £10 per hour for your participation. There is also the possibility to earn a small additional compensation on the computerised task(s) depending on your performance in these games.

Who will know you are taking part in the study?

We will inform your personal therapist that you are taking part in the study. We will inform your GP of your participation in this study, but information collected during all stages of the study will be kept strictly confidential. All information will only be viewed by members of the research teams at University College London and Virginia Tech University in the US (this is the

Principle Investigator's second office). **However, if through the course of the study it was found that you are at immediate risk of harm to yourself or others, this information will be shared with your therapist or GP and, if necessary, emergency services.**

Your consent form will be kept in a separate location from all your other data, ensuring that this remains anonymous. All data will be stored in secure locations whereby a participant ID will be assigned to your data. Non-identifiable personal information and the results of your tasks will be recorded on computers or flash drives which are password protected. Any published data will also be entirely anonymous meaning individuals cannot be identified.

The data from this study will be stored in accordance with the UCL and NHS Data Protection and Records Management policies.

All data will be collected and stored in accordance with the Data Protection Act 1998.

What will happen to the results of the research study?

The results will be written up in the form of reports to be submitted to scientific journals or presented at conferences. As mentioned, you will not be identifiable from these results. On completion and if you request it you will be sent a report of the study.

What if there is a problem?

Every care will be taken in the course of this study. However, in the unlikely event that you are injured by taking part, compensation may be available.

If you suspect that the injury is the result of the Sponsor's (University College London) negligence then you may be able to claim compensation. After discussing with your research doctor, please make the claim in writing to Dr. Steven Pilling or Dr Tobias Nolte on behalf of the Chief Investigators (Profs Read Montague and Peter Fonagy) who are based at University College London. The Chief Investigator will then pass the claim to the Sponsor's Insurers, via the Sponsor's office. You may have to bear the costs of the legal action initially, and you should consult a lawyer about this.

If you wish to complain, or have any concerns about any aspect of the way you have been approached or treated by members of staff you may have experienced due to your participation in the research, National Health Service or UCL complaints mechanisms are available to you. Please ask your research doctor if you would like more information on this. In the unlikely event that you are harmed by taking part in this study, compensation may be available to you. If you suspect that the harm is the result of the Sponsor's (University College London) or the hospital's negligence then you may be able to claim compensation. After discussing with your research doctor, please make the claim in writing to the Prof Fonagy who is the Chief Investigator for the research and is based at UCL, Research Department of Clinical, Educational and Health Psychology, 1-19 Torrington Place, London, WC1E 7HB. The Chief Investigator will then pass the claim to the Sponsor's Insurers, via the Sponsor's office. You may have to bear the costs of the legal action initially, and you should consult a lawyer about this

Who has reviewed this study?

This study has been reviewed by the **Queen Square REC (16/LO/0077).** Insurance/Indemnity for this study is provided by UCL.

Contact Details

If you wish to contact the research team to discuss any of the information further or any concerns you have about the study, then please do so by getting in touch with the members of the research team listed below:

If you feel that we have not addressed your questions adequately or if you have any concerns about the conduct of the research team, then please contact myself or the clinical supervisor Dr. Steven Pilling (s.pilling@ucl.ac.uk, Professor of Clinical Psychology and Clinical Effectiveness, Div of Psychology & Language Sciences, Faculty of Brain Sciences at UCL).

Steve Pilling, PhD
Research Department of Clinical, Educational and Health Psychology
General Office,
1-19 Torrington Place, London, WC1E 7HB
s.pilling@ucl.ac.uk
0207 6791785

Tobias Nolte MD
Wellcome Trust Centre for Neuroimaging & Research Department of Clinical, Educational and Health Psychology
12 Queen Square
London
WC1N 3BG
+44(0)202 77942312

Thank you very much for taking the time to read this information sheet.

Appendix 4

Patient Health Questionnaire (PHQ)

Patient Health Questionnaire (PHQ-9)

Patient Name: _____ **Date:** _____

	Not at all	Several days	More than half the days	Nearly every day
1. Over the *last 2 weeks*, how often have you been bothered by any of the following problems?				
a. Little interest or pleasure in doing things	☐	☐	☐	☐
b. Feeling down, depressed, or hopeless	☐	☐	☐	☐
c. Trouble falling/staying asleep, sleeping too much	☐	☐	☐	☐
d. Feeling tired or having little energy	☐	☐	☐	☐
e. Poor appetite or overeating	☐	☐	☐	☐
f. Feeling bad about yourself or that you are a failure or have let yourself or your family down	☐	☐	☐	☐
g. Trouble concentrating on things, such as reading the newspaper or watching television.	☐	☐	☐	☐
h. 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.	☐	☐	☐	☐
i. Thoughts that you would be better off dead or of hurting yourself in some way.	☐	☐	☐	☐
2. If you checked off any problem on this questionnaire so far, 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
	☐	☐	☐	☐

Appendix 5

Epistemic Trust Scale (ETS)

Please read the following statements and indicate the extent to which you agree or disagree by ticking the box that most closely corresponds to your opinion.

q1
Psychotherapists are more trustworthy than most other people

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q2
I would be very likely to take the advice of a psychotherapist

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q3
I think that my psychotherapist would always be honest with me

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q4
A lot of psychotherapists cannot be trusted

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q5
Most psychotherapists want what is best for their clients

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q6
Psychotherapists often "get it wrong"

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q7
I don't expect my psychotherapist to really care about me

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q8
It will take a long time for me to trust my psychotherapist fully

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q9
If I am totally open with my psychotherapist I may get hurt

○		Strongly agree

○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q10
I don't expect my psychotherapist to tell me what he or she really thinks about me

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q11
I don't think I could ever fully trust my psychotherapist

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q12
I believe that most psychotherapists are sincere

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q13
I tend not to follow other people's advice about how to live my life

○		Strongly agree
○		Agree
○		Somewhat agree

○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q14
I don't like people noticing things about me that I am not aware of myself

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q15
I love learning from new people

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q16
Most people misunderstand me ("get me all wrong")

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q17
I always give people the benefit of the doubt

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree

○		Disagree
○		Strongly disagree

q18
I usually ask people for advice when I have a personal problem

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q19
I don't doubt people's motives when they criticise me

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q20
If you put a lot of faith in people you will get hurt

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q21
I will not trust someone until they have proven themselves trustworthy

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q22

I always doubt people's motives when they complement me

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q23
I find it hard to trust people with whom I have little in common

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

q24
Most people are genuine

○		Strongly agree
○		Agree
○		Somewhat agree
○		Neither agree or disagree
○		Somewhat disagree
○		Disagree
○		Strongly disagree

Appendix 6

Permission Letter for Use of WAI-SR

SOCIETY FOR PSYCHOTHERAPY RESEARCH

April 4, 2018

Abbie Wickham
Doctoral Candidate
University College London
London, UK

Dear Ms. Wickham,

You have our permission to use the Working Alliance Inventory-SV (WAI-SV) in your doctoral research project exploring the relationship between epistemic trust and treatment outcome in individuals with depression. Please be aware that we require publishing the following note at the end of the measure:

Reprinted by permission of the Society for Psychotherapy Research © 2016.

We wish you the best in your work. Please consider joining the Society for Psychotherapy Research, an international, multidisciplinary scientific association devoted to research on psychotherapy. SPR also plays an important role in providing opportunities for interaction and dialogue between researchers and clinicians interested in psychotherapy. You may read more about us at www.psychotherapyresearch.org.

Sincerely,

[redacted]

Marna S. Barrett, Ph.D.
Executive Officer
sprexecutive@gmail.com

Appendix 7

Expected Contingent Responses Scale (ECRS)

Below are a series of statements. Imagine what your therapist will be like when you begin your sessions with them. Please circle the option on the likert scale (Always, Often, Sometimes, Rarely, Never) that best describes your therapist, as you imagine them to be.

Q1) My therapist cannot tell how I am feeling.

Always Often Sometimes Rarely Never

Q2) My therapist has a good sense of what it is like to be me.

Always Often Sometimes Rarely Never

Q3) My therapist is not aware of what matters most to me.

Always Often Sometimes Rarely Never

Q4) My therapist can anticipate what is likely to upset me.

Always Often Sometimes Rarely Never

Q5) My therapist cannot see issues that I am facing from my point of view.

Always Often Sometimes Rarely Never

Q6) My therapist recognises when I find therapy too difficult.

Always Often Sometimes Rarely Never

Q7) My therapist can see when I need cheering up.

Always Often Sometimes Rarely Never

Q8) My therapist can sense when my mood is changing in the session.

Always Often Sometimes Rarely Never

Q9) My therapist doesn't know how to get round my reluctance to cooperate with him sometimes.

Always Often Sometimes Rarely Never

Appendix 8

Perceived Contingent Responses Scale (PCRS)

Below are a series of statements. Please circle the option on the likert scale (Always, Often, Sometimes, Rarely, Never) that best describes your therapist.

Q1) My therapist cannot tell how I am feeling.

Always Often Sometimes Rarely Never

Q2) My therapist has a good sense of what it is like to be me.

Always Often Sometimes Rarely Never

Q3) My therapist is not aware of what matters most to me.

Always Often Sometimes Rarely Never

Q4) My therapist can anticipate what is likely to upset me.

Always Often Sometimes Rarely Never

Q5) My therapist cannot see issues that I am facing from my point of view.

Always Often Sometimes Rarely Never

Q6) My therapist recognises when I find therapy too difficult.

Always Often Sometimes Rarely Never

Q7) My therapist can see when I need cheering up.

Always Often Sometimes Rarely Never

Q8) My therapist can sense when my mood is changing in the session.

Always Often Sometimes Rarely Never

Q9) My therapist doesn't know how to get round my reluctance to cooperate with him sometimes.

Always Often Sometimes Rarely Never

Appendix 9

Demographics Questionnaire

BACK

Measure Input

Demographics Questionnaire (MDD Study) : Demographics Questionnaire (MDD Study)

Completer:	Patient	
Date:		

Gender

Male	Female	Transgender	Transexual

Age

Place of birth

Date of birth

Ethnicity

	White - British
	White - Irish
	White - any other white background
	Black/Black British - Caribbean
	Black/Black British - African
	Black/Black British - any other Black background

	Mixed - White and Black Caribbean
	Mixed - White and Black African
	Mixed - White and Asian
	Any other mixed background
	Asian/British Asian - Indian
	Asian/British Asian - Pakistani
	Asian/British Asian - Bangladeshi
	Asian/British Asian - any other Asian background
	Chinese
	Any other background not stated
	Not stated

[redacted]

If other, please state

Mother's ethnicity

	White - British
	White - Irish
	White - any other white background
	Black/Black British - Caribbean
	Black/Black British - African
	Black/Black British - any other Black background
	Mixed - White and Black Caribbean
	Mixed - White and Black African
	Mixed - White and Asian
	Any other mixed background
	Asian/British Asian - Indian
	Asian/British Asian - Pakistani
	Asian/British Asian - Bangladeshi

	Asian/British Asian - any other Asian background
	Chinese
	Any other background not stated
	Not stated

[redacted]

If other, please state

Father's ethnicity

	White - British
	White - Irish
	White - any other white background
	Black/Black British - Caribbean
	Black/Black British - African
	Black/Black British - any other Black background
	Mixed - White and Black Caribbean
	Mixed - White and Black African
	Mixed - White and Asian
	Any other mixed background
	Asian/British Asian - Indian
	Asian/British Asian - Pakistani
	Asian/British Asian - Bangladeshi
	Asian/British Asian - any other Asian background
	Chinese
	Any other background not stated
	Not stated

[redacted]

If other, please state

Employment status

	Employed - full time
	Employed - part time
	Employed - casual work
	Self employed
	Internship/apprenticeship
	Student
	Retired
	Carer
	Unemployed

[redacted]

Occupation

Household income

		Less than £10,000
		£10,000-£20,000
		£20,000-£35,000
		£35,000-£50,000
		£50,000-£75,000
		£75,000-£100,000
		£100,000+

[redacted]

edu
Level of education (please choose highest)

	No qualifications
	Other qualifications not listed (e.g. certificate)
	Vocational level (e.g. NVQ) 1, GCSE (< A*-C) or equivalent
	GCSE (5 or more grades A*-C), vocational level (e.g. NVQ) 2 or equivalent

	A Level, vocational level (e.g. NVQ) 3 or equivalent
	Higher education or professional/vocational equivalent
	Post graduate education or professional/vocational equivalent (e.g. Masters, PhD, MD)

[redacted]

Years in education (total)

Mother's level of education (please choose highest)

	No qualifications
	Other qualifications not listed (e.g. certificate)
	Vocational level (e.g. NVQ) 1, GCSE (< A*-C) or equivalent
	GCSE (5 or more grades A*-C), vocational level (e.g. NVQ) 2 or equivalent
	A Level, vocational level (e.g. NVQ) 3 or equivalent
	Higher education or professional/vocational equivalent
	Post graduate education or professional/vocational equivalent (e.g. Masters, PhD, MD)

[redacted]

Years in education (total)

Father's level of education (please choose highest)

	No qualifications
	Other qualifications not listed (e.g. certificate)
	Vocational level (e.g. NVQ) 1, GCSE (< A*-C) or equivalent
	GCSE (5 or more grades A*-C), vocational level (e.g. NVQ) 2 or equivalent
	A Level, vocational level (e.g. NVQ) 3 or equivalent
	Higher education or professional/vocational equivalent
	Post graduate education or professional/vocational equivalent (e.g. Masters, PhD, MD)

[redacted]

Years in education (total)

Have you experienced any significant losses due to death during your childhood, ages 0-18 (i.e. parents, siblings, close family member)?

Who	How old were you at the time of loss? (years)	Due to what circumstances did the loss occur?	

Who	How old were you at the time of separation? (years)	Due to what circumstances did the separation occur?	How long for? (months)	

Have you ever had any face-to-face therapy/counselling in the past?

Yes	No

If yes, approximately how many sessions did you have in total?

Have you already started therapy?

Yes	No

POD - Measure Input