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A Systematic Review and Meta-Analysis of CBT Interventions Based on the Fennell Model of Low Self-Esteem

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Daniel C. Kolubinski^a, Daniel Frings^a, Ana V. Nikčević^b, Jacqueline A. Lawrence^a, and
Marcantonio M. Spada^{a,*}

^a Division of Psychology, School of Applied Sciences, London South Bank University,
London, UK

^b Department of Psychology, Kingston University, Kingston upon Thames, UK

* Correspondence to: Dan Kolubinski, Division of Psychology, School of Applied Sciences,
London South Bank University, London, United Kingdom. Tel. +44 (0)20 7815 7815, e-mail
kolubind@lsbu.ac.uk.

Abstract

Low self-esteem is a feature of several mental health disorders that has been directly treated with Cognitive-Behavioral Therapy (CBT). The aim of our study was to determine the efficacy of interventions for improving low self-esteem in adults by utilizing the model outlined in Fennell (1997; 1998; 1999). A literature search identified 8 studies that met the inclusion criteria of CBT-based interventions for low self-esteem using this model, 7 of which were used in a quantitative synthesis. These studies included weekly group and individual sessions and one-day workshop formats. Summary effect sizes of 1.12 and 0.34 at post-treatment with low levels of heterogeneity were observed for weekly sessions and one-day workshops, respectively. Comparable results were found for the reduction of depressive symptoms. Results suggest that CBT-based interventions may be efficacious for treating individuals with low self-esteem, according to changes in self-report measures; however, it is unclear whether these interventions are dissimilar to those aimed at reducing depression.

Key words: cognitive-behavioral therapy; meta-analysis; low self-esteem; depression; systematic review.

1. Introduction

1.1 Rationale

The study of self-esteem has a long and complex history in the field of psychology, dating back to the founding of the discipline (Baumeister et al., 2003; Crocker and Luhtanen, 2003; Park and Crocker, 2013; Zeigler-Hill, 2011). Historically, both James (1890) and Rosenberg (1965) considered self-esteem to be dependent on one's perceived ability to achieve certain life goals (Emler, 2001; Noordenbos et al., 2014; Zeigler-Hill, 2013) and, as the evaluative aspect of the self, it represents the extent to which one likes oneself (Brown, 2014; Brown and Marshall, 2006; Zeigler-Hill, 2011). When the evaluation is generally positive, people are considered to have high self-esteem, and when it is negative, it is termed low self-esteem.

For over two decades, there has been a debate over the value of viewing self-esteem as a single dimension from low to high and whether the pursuit of high self-esteem along that dimension is even desirable (Baumeister et al., 1996; Emler, 2001; Kernis, 2003). This debate partially stems from misconceptions about how to define and measure self-esteem. If, for example, self-esteem becomes contingent upon extrinsic factors, where one feels a sense of self-worth only when things are going well, then an individual may evaluate oneself positively and exhibit high self-esteem so long as certain conditions are being met. However, this could lead to a heightened sense of threat if circumstances beyond their own control lead to a failure or rejection by others. (Baumeister et al., 2003, 1996; Borton et al., 2012; Crocker and Park, 2004). Furthermore, self-esteem has also been described as a 2-dimensional construct, combining self-competency and self-liking (Mruk, 2013a; Tafarodi and Swann, 1995).

This has led to a departure away from thinking that self-esteem lies simply along a continuum and a distinction is made between *fragile* forms of self-esteem, where feelings of self-worth are contingent and may fluctuate from day to day, and *secure* forms of high self-

esteem, where self-esteem is more stable and unconditional (Goldman, 2006; Kernis, 2003; Kernis et al., 2008).

The consequences of low self-esteem, on the other hand, are not generally debated; however, its causes and consequences are still being explored (Orth et al., 2008; Rieger et al., 2016; Zeigler-Hill, 2011). Although not itself considered a psychiatric disorder, low self-esteem has been viewed as a symptom or associated feature of several emotional and personality disorders (Fennell, 1998; O'Brien et al., 2006; Zeigler-Hill, 2011). The Diagnostic and Statistical Manual of Mental Health Disorders 5 (DSM-5; American Psychiatric Association, 2013) associates low self-esteem, negative self-evaluation and high levels of self-criticism with 21 different disorders, as either diagnostic or associative features, risk factors or consequences. This includes, but is not limited to, depression, anorexia nervosa, bulimia nervosa, sexual dysfunction and avoidant personality disorder.

Cognitive-Behavioral Therapy (CBT) is a well-established treatment for many psychological disorders, particularly anxiety and depression (Butler et al., 2006; Eysenck, 1994; Tolin, 2010). In recent years, interventions have been designed using CBT-based theory and techniques to raise levels of self-esteem. Fennell (1997), for example, has elaborated on the work of Beck (1967, 1976) to devise a schematic model of low self-esteem (See Figure 1). In this model, an individual develops a general image of the self that is based on past experiences, which Fennell (1997) refers to as the *bottom line* ('I'm worthless', etc.). This schema affects how incoming information is processed and Fennell postulates that when the bottom line is negative, the individual develops rules for living in order to keep it hidden from the view of others (e.g., 'I must succeed at everything I do or else others will see how worthless I am'). However, when the individual is in a situation where the rule may be bent or broken, such as a potential failure, the bottom line becomes activated and the individual begins to predict negative consequences, such as judgment or punishment by others.

This leads to a rise in anxiety and associated self-defeating safety-seeking behaviors, such as withdrawal, self-focus or reassurance seeking, which then confirm the 'truth' of the bottom line. By focusing on one's level of worthlessness, there is an increase in self-critical thinking, which then worsens the person's mood. Fennell (1997) proposes that a vicious cycle emerges, because the bottom line becomes more easily activated when a person's mood is low and that it then strengthens negative thinking, anxiety, unhelpful behaviors, self-criticism and depressed mood.

Little research has been done to directly test the validity of Fennell's model. However, research does indicate that both anxiety and depression may be a cause of, and symptom of, low self-esteem. A meta-analysis conducted by Sowislo and Orth (2013) sought to determine whether self-esteem contributes to greater levels of depression or anxiety, referred to as the vulnerability model, or whether experiencing symptoms of depression or anxiety negatively affects levels of self-esteem, referred to as the scar model. They determined that both models were equally predictive for levels of anxiety, although the vulnerability model was more predictive for symptoms of depression. This suggests that the relationship between low self-esteem and psychopathology may be reciprocal in nature, as described by the Fennell model.

The aims of CBT-based interventions are to weaken old, negative beliefs and to establish a more positive alternative (Fennell, 1997). This is done by re-evaluating negative predictions, reducing physical symptoms of anxiety, changing behavior, shifting a perceptual bias, and reducing self-critical thinking through cognitive restructuring and behavioral experiments. In this regard, the format of treatment is similar to the treatment of other disorders using CBT, although the central underpinning of treatment is on addressing one's overall view of the self and fostering greater acceptance. Interestingly, though, improving self-esteem has been described as an intervention within the treatment of depression

(Overholser, 1996) and it is not entirely clear of the difference between treating low self-esteem and treating depression.

Despite the amount of research that has been undertaken to understand the concept of self-esteem, there has been little research into the impact of CBT-based interventions designed to improve self-esteem. Numerous meta-analyses have been conducted on the effect of CBT for anxiety and depression (Butler et al., 2006; Tolin, 2010), many of which use a self-esteem measure as a secondary outcome. Again, the line between treatment for depression and treatment for low self-esteem is not entirely clear at this point.

To date, there is only one systematic review that has explored the impact of CBT on low self-esteem (Taylor and Montgomery, 2007). However, even this review focused on adolescents with a diagnosis of a depressive disorder, where self-esteem was, again, treated as a secondary measure. The authors were able to identify only two suitable studies (Reynolds and Coats, 1986; Rosselló and Bernal, 1999). From these studies, the authors concluded that CBT may be effective in increasing self-esteem during the treatment of depression in adolescents, although one of the two reported studies did not produce a statistically significant effect size.

1.2 Objectives

CBT is a widely-used model of therapy and self-esteem is a widely-studied topic (Butler et al., 2006; Tolin, 2010; Zeigler-Hill, 2011). In order to produce a valid and robust summary effect, and avoiding an 'apples and oranges' approach to meta-analysis, it was decided a priori that this study would examine a single, consistent approach to applying CBT-based techniques in the treatment of low self-esteem (Sharpe, 1997). The objective of our study, therefore, is to assess the efficacy of the CBT-based intervention, using the treatment model outlined by Fennell (1998; 1999). Participants for these interventions will be adults with low

self-esteem, who do not exhibit a severe and enduring mental health condition or cognitive deficit.

2. Methods

2.1 Search strategy for the identification of studies

The following electronic databases were used to locate studies: Academic Search Complete; British Education Index; CINAHL Complete; Education Research Complete; Education Resource Information Center; Psychology and Behavioral Sciences Collection; Humanities International Complete; MEDLINE with Full Text; PsycARTICLES; PsycINFO; SocINDEX with Full Text. The search was completed in July 2017. Relevant articles were identified by their title and abstracts by the first author of this study.

2.2 Search terms

Articles were included in the search if they contained the terms 'low self esteem' and a variation of 'cognitive behavioral therapy,' so as to cast as wide a net as possible in the initial stage. A screening process would then examine titles and abstracts in order to assess suitability.

2.3 Criteria for considering studies for review

Studies were included in the review if they reported outcome data using an established self-esteem measure prior to, and following, a CBT-based intervention designed for individuals with low self-esteem based on the model described by Fennell (1997; 1998; 1999).

Due to the limited results of the study reported by Taylor and Montgomery (2007), this review included cohort studies as well as randomized controlled trials. Studies were excluded if the majority of participants were under 18 years of age, and if the cohort explicitly involved those who had experienced an episode of psychosis or had been diagnosed with either Bipolar Disorder or a cognitive deficit, including brain injury, learning disability or

autism. Since self-esteem is often considered a secondary outcome of CBT, we only included studies where the intervention was explicitly focused on increasing self-esteem. The search included journal articles and dissertations and no restrictions were placed on language.

2.4 Assessment of methodological quality

Articles were assessed using the quality checklists from the Critical Appraisal Skills Programme (Singh, 2013). Randomized controlled trials and cohort studies were assessed using their respective checklist. All appraisals were conducted by the first author and reviewed by the last author. There were no disagreements between the authors on the appraisals or suitability.

2.5 Data abstraction

A range of characteristics were extracted from each study, including the number of participants for each study, attrition rates, publication year, comparison group (where applicable) and follow-up period (see Tables 1-3).

It was decided, a priori, that the primary outcome of interest would be a validated self-report measurement of self-esteem. Where available, the pre-, post- and follow-up scores were extracted, along with the standard deviations for each group. This included the group of interest in all studies and any controls in RCTs. If it was not possible to extract the necessary data, authors were contacted and asked to provide it.

2.6 Data synthesis

In order to have a common metric across all studies, a standardized mean difference (SMD) was calculated and then adjusted using Hedge's g for each study at post and, if applicable, follow-up (Cohen, 1977; Hedges, 1981). Each of the included studies also utilized a validated measure of depression as well. It was thus decided that depression scores would also be extracted in a similar manner. Where necessary, measurements were reversed scored so that higher scores represented higher levels of self-esteem and higher levels of

depression. Correlations between pre- and post-scores were not provided in the results of the cohort studies, which are required in order to calculate an effect size for a cohort. They, therefore, had to be estimated. The dataset from one of the studies (Horrell et al., 2014) was kindly provided, which included data on over 350 participants. Spearman correlations were calculated for the pre- and post-scores on the self-esteem (RSES) and depression (BDI) measurements ($r = 0.6, p < 0.01$ and $r = 0.62, p < 0.01$, respectively). A correlation of 0.6 was, therefore, assumed across all measurements for the purpose of the quantitative analysis.

Standardized mean differences (SMD) were then used to calculate the level of heterogeneity (Q, I^2 and H^2) and summary effect sizes for weekly sessions and one-day workshops separately. Due to lack of follow-up data for weekly sessions, SMD were calculated using pre- and post-treatment data only. SMDs for one-day workshops utilized pre- and 3-month-follow-up data. A trim and fill method (Duval and Tweedie, 2000) was applied to these analyses where possible in order to ascertain the presence of a publication bias.

3. Results

3.1 Trial flow

The initial search yielded a result of 474 articles, once duplicates were removed, and two additional articles that were previously known to the first author were also included. The titles and abstracts were then reviewed by the first author in order to assess suitability, which was not the case for the vast majority of the search results. Both “low self-esteem” and “cognitive-behavioral therapy” are broad terms and many of the studies either did not involve a therapeutic intervention, included participants with a psychiatric condition considered outside of the remit of this study, used self-esteem as a secondary measure, rather than a primary focus of the intervention, or measured self-esteem to study its value as a predictor

variable for another outcome measurement. Most importantly, however, none of those studies used the intervention outlined in Fennell (1998, 1999).

Titles and abstracts were identified for 8 studies, all peer-reviewed journal articles. These studies consisted of weekly sessions and one-day psychoeducational workshops. Two studies reported on the same cohort of participants (Brown et al., 2008; Brown et al., 2004). We decided to include only the results of the first study (Brown et al., 2004) in the quantitative analysis for two reasons. First, the original design was a randomized controlled trial comparing an intervention group to a waitlist control group, which was similar in design to a corresponding study (Horrell et al., 2014). As the control group for Brown et al. (2004) was on a waitlist in the original RCT, they had received the intervention by the time of the second study and were reported as a cohort design. Second, the original study contained the data for a 3-month follow-up, which was also similar to (Horrell et al., 2014). The primary focus of the second study, on the other hand, was to report on the 1- and 2-year follow-up data, which is not available for any of the other studies. The results of this follow-up study, however, will be addressed in the Discussion section.

. For more information on the trial flow, see Figure 2.

3.2 Methodological quality

Authors were contacted where possible in order to provide details regarding randomization or sampling that were not mentioned in their respective papers. When a response was not received, we marked the item of interest as NS ('not stated').

3.3 Study and participant characteristics

Using the quality checklists from the Critical Appraisal Skills Programme (Singh, 2013), each of the studies were considered to meet the minimum criteria of quality for this study. They all had a clear focus and recruitment was deemed to be appropriate. Randomization procedures, measurements and validity of the conclusions made were all acceptable. It

should be noted, however, that there was no mention in any of the cohort studies about an attempt to control for confounding factors.

Included studies were published between 2004 and 2016. They were all conducted in the UK and consisted of 4 cohort studies and 3 RCTs. Studies utilized 2 different self-esteem self-report measures: the Rosenberg Self-Esteem Questionnaire (RSES; Rosenberg, 1965) and the Robson Self-Concept Questionnaire (RSCQ; Robson, 1989) and 4 measures of depression: the Beck Depression Inventory (BDI; Beck et al., 1961); the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996); the Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983) and the Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001). The averages for each of the self-esteem measures were near or slightly below cut-off scores for low self-esteem (Schmitt and Allik, 2005) and average depression scores were mild to medium at the onset of therapy according to their respective cut-off scores.

No cohort study used a separate control group, although one study (McElhinney et al., 2016) used a baseline waiting period as a control. Given that there was no significant difference from the start of the waiting period to the start of the intervention, this study was treated as a cohort study for the purposes of this analysis. RCTs compared the results of the intervention group to waitlist controls. Five studies used an intent-to-treat analysis when reporting their data (see Table 1).

Overall, 821 participants were involved in the 7 studies, with 520 individuals receiving a CBT-based intervention for low self-esteem, of which approximately 80% were female. No studies contained a population less than 50% female and 2 studies were 100% female. Populations sampled varied from individuals with low self-esteem in the general population to those with a clinically diagnosed mental health disorder (predominantly depression or anxiety). Ages varied, ranging from Mean = approx. 30 to Mean = approx. 44.1 (see Table 2).

The interventions included in this review were either weekly CBT-based sessions (4 group and 1 individual) or one-day workshop (2 group). The length of the weekly interventions ranged from 8 to 13.6 weeks (median = 10 weeks). The number of hours of therapy ranged from 15 hours to 20 (median = 16). The attrition rate between pre- and post-intervention for these studies ranged from 9% to 49%. Follow-up data were either not included for most of the weekly sessions or the attrition rate was too high to draw any meaningful conclusions. There were two 1-day workshops consisting of 7 hours each, with an attrition rate of 9% and 16% at three-month follow-up (see Table 3). As mentioned previously, Brown et al. (2008) followed up the cohort reported in Brown et al. (2004) over 12 and 24 months.

3.4 The impact of CBT-based interventions for low self-esteem

Data extracted from the 7 studies enabled us to calculate effect sizes regarding the change in self-esteem and depression scores. Effect sizes varied at post-treatment between 0.28 and 1.94 for the self-esteem scores and between -0.31 and -2.13 for depression scores. It is important to highlight the differences between the listed effect sizes used in this analysis from those reported in one of the studies. Waite et al. (2012) report Cohen's d (Cohen, 1977) of 2.02, which we have adjusted using Hedge's g (Hedges, 1981) to account for the small sample size.

Summary effects were calculated using metafor for R for all analyses with a random-effects model (Viechtbauer, 2010). Due to the qualitative difference between weekly sessions and one-day workshops, we determined that it would be prudent to separate the two groups entirely rather than complete a sub-group analysis. An overall summary effect of all 7 studies would not be insightful. Three measures of heterogeneity were also utilized in the analyses (Q , I^2 and H^2). Q is the ratio of the observed variation across studies to the within-study error; I^2 explains the proportion of the observed variance that reflects differences in

effect sizes by dividing the total heterogeneity by the total variability; H^2 is the ratio of the total variability of the observed outcomes to the sampling variability (Borenstein et al., 2009; Higgins and Thompson, 2002; Viechtbauer, 2010).

The first analysis examined the effect of weekly sessions on levels of self-esteem. The trim and fill method was applied (Duval and Tweedie, 2000) and suggested that there may be a publication bias (see Figure 4). Two hypothetical studies were added to account for this. The heterogeneity amongst these studies was not statistically significant ($Q(6) = 7.1462$, $p > .05$; $I^2 = 0\%$; $H^2 = 1$), indicating low heterogeneity (Borenstein et al., 2009). The summary effect for these studies was 1.12 (95% Confidence Interval [CI] = 0.97, 1.27), indicating a significant increase in levels of self-esteem (see Figure 3).

The second analysis used the same cohort of studies and examined the impact on depression scores. Applying the trim and fill method again suggested a possible publication bias and one study was added to account for this (see Figure 6). At post-treatment, the heterogeneity was statistically significant ($Q(5) = 15.9229$, $p < 0.01$; $I^2 = 72.69\%$; $H^2 = 3.66$). A leave-one-out sensitivity analysis (Viechtbauer, 2010) concluded that the significant heterogeneity is a result of one study (Morton et al., 2012). The summary effect size for these studies was -1.20 (95% CI = -1.56, -0.84), indicating a significant reduction in the symptoms of depression (see Figure 5).

The third analysis examined the effect of a one-day workshop on levels of self-esteem. As there were only two studies available for this analysis, the trim and fill method was not performed. The heterogeneity amongst these studies was not statistically significant ($Q(1) = 0.079$, $p > .05$; $I^2 = 0\%$; $H^2 = 1$), indicating low heterogeneity (Borenstein et al., 2009). The summary effect for these 2 studies was 0.34 (95% Confidence Interval [CI] = 0.15, 0.52) (see Figure 7).

The final analysis examined the same two studies with respect to the reduction in depression scores. The heterogeneity, again, was not statistically significant ($Q(1) = 0.7133$, $p > .05$; $I^2 = 0\%$; $H^2 = 1$). The summary effect for these two studies was -0.47 (95% Confidence Interval [CI] = $-0.66, -0.29$) (see Figure 8).

4. Discussion

Despite the extensive history of self-esteem research, dating back to the early foundations of psychology (James, 1890), studies examining the impact of treatment interventions to raise low levels of self-esteem is relatively recent. CBT is a broadly-used term to refer to short-term therapeutic interventions that attempt to engender affective change by modifying cognitions and behavior. This is a widely studied form of treatment, particularly for mood and anxiety disorders (Butler et al., 2006; Tolin, 2010).

This study attempted to systematically review the key findings of 7 studies conducted to measure the impact of CBT to raise low self-esteem and how those interventions also impacted symptoms of depression. Despite previously being considered to be drawn from a single common factor, depression and self-esteem appear to be two separate constructs (Orth et al., 2008; Rieger et al., 2016; Sowislo and Orth, 2013) In doing so, we distinguished between weekly sessions and one-day workshops, where summary effects for weekly sessions were 1.12 for self-esteem and -1.20 for depression at completion of treatment and 0.34 and -0.47 , respectively, for one-day workshops 3 months after intervention. Similar to a correlation coefficient, the direction of movement is indicated by whether the effect size is positive or negative and the magnitude of change is determined by the absolute value; meaning that self-esteem increased as a result of the intervention and symptoms of depression decreased.

Cutoffs for small, medium and large effect sizes are 0.2, 0.5 and 0.8 respectively (Cohen, 1977). These are standardized scores, which effectively represent the number of standard

deviations that separate the intervention group from either their pre-treatment scores or from the scores of a control group, allowing us to compare changes across different measures. Using this as a guide, we can conclude that CBT appears to have a large effect on raising levels of self-esteem and reducing symptoms of depression when using weekly individual or group sessions, where results indicated the scores for the participants who receive the intervention are over one standard deviation, on average, away from their counterparts; whilst a small to medium effect is observed when conducting a one-day workshop. These results are comparable to studies that have suggested that self-statement modification can have a significant impact on levels of self-esteem (Clore and Gaynor, 2006; Lange et al., 1998; Philpot and Bamberg, 1996).

4.1 Treating self-esteem as a proxy for depression?

It is unclear at this time, however, whether these interventions are qualitatively different than CBT-based interventions that directly target symptoms of depression and treat self-esteem as a secondary outcome. The magnitude of the effect sizes indicate that these treatments were equally effective at lowering depression and raising self-esteem. These two constructs are highly correlated and there is evidence to suggest that self-esteem and depression may have a circular relationship (Orth et al., 2008; Rieger et al., 2016; Sowislo and Orth, 2013). Future research is required to determine whether the interventions listed in this study offer any benefit above and beyond current interventions for depression, where treatment for unipolar depression using CBT also demonstrate large effect sizes. (Butler et al., 2006; Tolin, 2010).

Along these lines, there is an important aspect of Brown et al. (2004, 2008) that warrants discussion. As mentioned previously, Brown et al. (2008) followed-up with their participants 1 and 2 years after participating in their one-day workshop. The difference between this study and Brown et al. (2004) is that the results of the intervention group and the waitlist

control group were combined to create a larger cohort study. By combining the data in this way, the authors of this study could distinguish between 'depressed' and 'non-depressed' participants based on a cut-off score of 14 on the BDI.

In doing so, they demonstrated that although the effect size listed in Brown et al. (2004) was not statistically significant for either self-esteem or depression scores, this is not the case when one only includes individuals who are clinically depressed. Once non-depressed participants are removed, 3-month post-treatment effect sizes increase to 0.84 (95% Confidence Interval [CI] 0.54, 1.14) for self-esteem and -1.13 (95% Confidence Interval [CI] = -1.46, -0.80) for depression and the gains for both continue for up to 2 years post-treatment. At the same time, however, the effect sizes for the non-depressed group drop to 0.07 and 0.09, respectively, neither of which are statistically significant. Although it is important to remember that this is only one study, it again calls into question whether self-esteem-based CBT is in fact a depression-based intervention.

4.2 Limitations of the primary studies

Limitations of the primary studies could have an impact on the results cited above. First and foremost, attrition rates were quite high at times. Whilst several of the studies accounted for the attrition by using an intent-to-treat analysis, this was not always the case. As a result, the post-treatment scores might not be a true reflection of the impact of the intervention in question. Follow-up data is also absent for many of the studies and was not included in this meta-analysis, aside from the results of Brown et al. (2008) mentioned above. Pack and Condren (2014) and Rigby and Waite (2006) are the only other two studies that contained pre-, post- and follow-up data. However, Pack and Condren (2014) report nearly a 50% attrition rate between pre- and post-scores and a further 68% attrition rate between post- and follow-up; rendering the follow-up score uninterpretable.

Second, the population of each of the studies ranged between 64% and 100% female. Although women generally tend to have lower self-esteem than men (Kling et al., 1999), it is difficult to generalize the effect of CBT on treating low self-esteem in males based on the results of these studies. Similarly, the studies also consisted solely of a UK-based population and may reflect cultural influences. Recent research into another CBT-based intervention, Competitive Memory Training (COMET), also appears to demonstrate similar effects in a Dutch population (Korrelboom et al., 2012, 2011, 2009). Again, however, these studies also feature predominantly female samples.

4.3 Limitations of this study

The results of this meta-analysis must be interpreted with caution due to potential limitations. First, we included studies that varied in terms of study design, interventions and population sampled. Waite et al. (2012), for example was the solitary study that consisted of individual therapy. Although the effect size was much higher than the others, the small sample size in this study meant that it contributed very little to the overall summary effect and had wide confidence intervals (see Figures 3 & 5). The summary effects, therefore, represent approximations of how effective CBT targeting low self-esteem could be in the raising self-esteem and reducing symptoms of depression using the Fennell model, although it is important to consider the variations in the studies when interpreting a general conclusion. RCTs are generally considered to draw similar conclusions to cohort studies (Anglemyer et al., 2014), however it might be disadvantageous to treat them equally.

Second, we used an estimate of the correlation between pre- and post-treatment measures based on test-retest correlations found on the Rosenberg Self-Esteem Scale and Beck Depression Inventory in one of the studies (Horrell et al., 2014). Calculating effect sizes based on a correlation of 0.5 or 0.7 would not generate a conclusion far removed from the one stated above; however, this is still an estimate and must be considered with caution.

Lastly, seven studies were identified in the screening stage that used a CBT-based approach, but were not included in this analysis, because they did not adhere to the treatment intervention outlined in Fennell (1998; 1999). These included Competitive Memory Training, mentioned above (COMET; Korrelboom et al., 2009; Korrelboom, Marissen, & van Assendelft, 2011), Rational Emotive Behavior Therapy (Pace, 2006), and other variations of Cognitive-Behavioral Therapy (Cajanding, 2016; Case, 2003; Chadwick et al., 2014; Warren et al., 1988). As mentioned earlier, it was decided a priori to include only one model of therapy in order to ascertain a valid summary effect (Sharpe, 1997). It would be beneficial for future research, however, to explore the wider impact of various therapeutic interventions in the treatment of low self-esteem, including those involving similar interventions that do not fall under the rubric of CBT (Bartoletti, 2008; Hakim-Larson and Mruk, 1997). Furthermore, this analysis only concentrated on studies that considered self-esteem as a primary target of intervention. There are many studies that measure self-esteem as a secondary target when treating various emotional and physical disorders and further research is required to understand the potential effects.

4.4 Limitations of the treatment of low self-esteem using CBT

There are also other aspects to consider when interpreting the conclusions of this study, aside from whether these interventions would be better classified as depression-based interventions. Firstly, as one of the most studied concepts in the field of psychology, self-esteem is a complicated and hotly contested construct (Baumeister et al., 2003; Cameron et al., 2013; Crocker and Park, 2004; Mruk, 2013b; Ryan and Brown, 2003; Trzesniewski et al., 2013; Zeigler-Hill, 2013). It has come to have different definitions, such as whether it is stable or unstable (Kernis et al., 1993, 1989; Kernis and Goldman, 2006), externally or internally contingent (Crocker and Luhtanen, 2003; Crocker and Park, 2004; Vonk and Smit, 2011), implicit (how you *feel* about yourself) or explicit (what you *think* about yourself)

(Borton et al., 2012; DeHart et al., 2013; Koole and Pelham, 2003). Rather than treating self-esteem as binary or unidimensional in terms of 'High' and 'Low', the argument has been made that it would be more beneficial to consider self-esteem along a 'Secure' vs. 'Fragile' continuum, consisting of multi-dimensional components (Goldman, 2006; Kernis, 2003). Mruk (2013a, 2013b), for example, refers to secure self-esteem as two-dimensional, where one requires a sense of competence, or efficacy, as well as worthiness, or belonging. Others have made the case that rather than focusing on levels of self-esteem, it might be more beneficial to focus directly on the act of self-criticism (Gilbert et al., 2004; Grzegorek et al., 2004; Neff and Vonk, 2009).

Unfortunately, very little consideration is given to these various forms of self-esteem in the included studies. It is possible that CBT might be able to address the instability of self-esteem, external contingency of self-worth and levels of self-criticism. Fennell (1997, 1999), for example, acknowledges the importance of helping individuals to become more accepting of their flaws and acknowledge their strengths. It also might help individuals to develop a sense of efficacy by encouraging them to engage in new activities, similar to how one might treat a mood disorder. We cannot be sure, however, whether an individual will in fact substitute one contingency of self-worth for another in treatment or whether CBT can address the emotional valence highlighted in measures of implicit self-esteem (Bosson et al., 2000). It is also possible that cognitive restructuring might be beneficial to increase explicit self-esteem, but might not impact implicit self-esteem (Sava et al., 2011). By treating low self-esteem with cognitive techniques, one might have the paradoxical impact of engendering a discrepancy between explicit and implicit self-esteem, which can have deleterious effects (Borton et al., 2012; Bosson et al., 2000; Jordan et al., 2003).

Furthermore, as widely used as the Rosenberg Self-Esteem Scale is, a 10-item measurement is unable to grasp the richness and complexity of how or why we think about

ourselves. Rather than a single-dimensional, content-based rating scale, one might also need to consider cognitive processes involved in developing a sense of self-worth. Rumination, for example, “the process of thinking perseveratively about one’s feelings and problems” (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008, p. 400), may play a significant role in defining and maintaining one’s self-esteem (Kuster et al., 2012; Orth et al., 2006). Recent research has started to explore the construct of self-critical rumination, which is a tendency to dwell on self-critical thoughts, in addition to the metacognitive processes involved in maintaining it (Kolubinski et al., 2017, 2016; Smart et al., 2015).

It is still unknown as to whether this particular cognitive process may have an impact on levels of self-esteem as measured by the RSES or whether CBT is able to address the cognitive and metacognitive processes that might underlie low self-esteem. Further research will be required to better understand the impact of self-critical rumination on self-esteem and whether it would be more beneficial to focus instead on redefining the processes behind how we think about ourselves rather than the content involved in what we think about ourselves.

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Figure 1: A cognitive model of low self-esteem (Fennell, 1997)

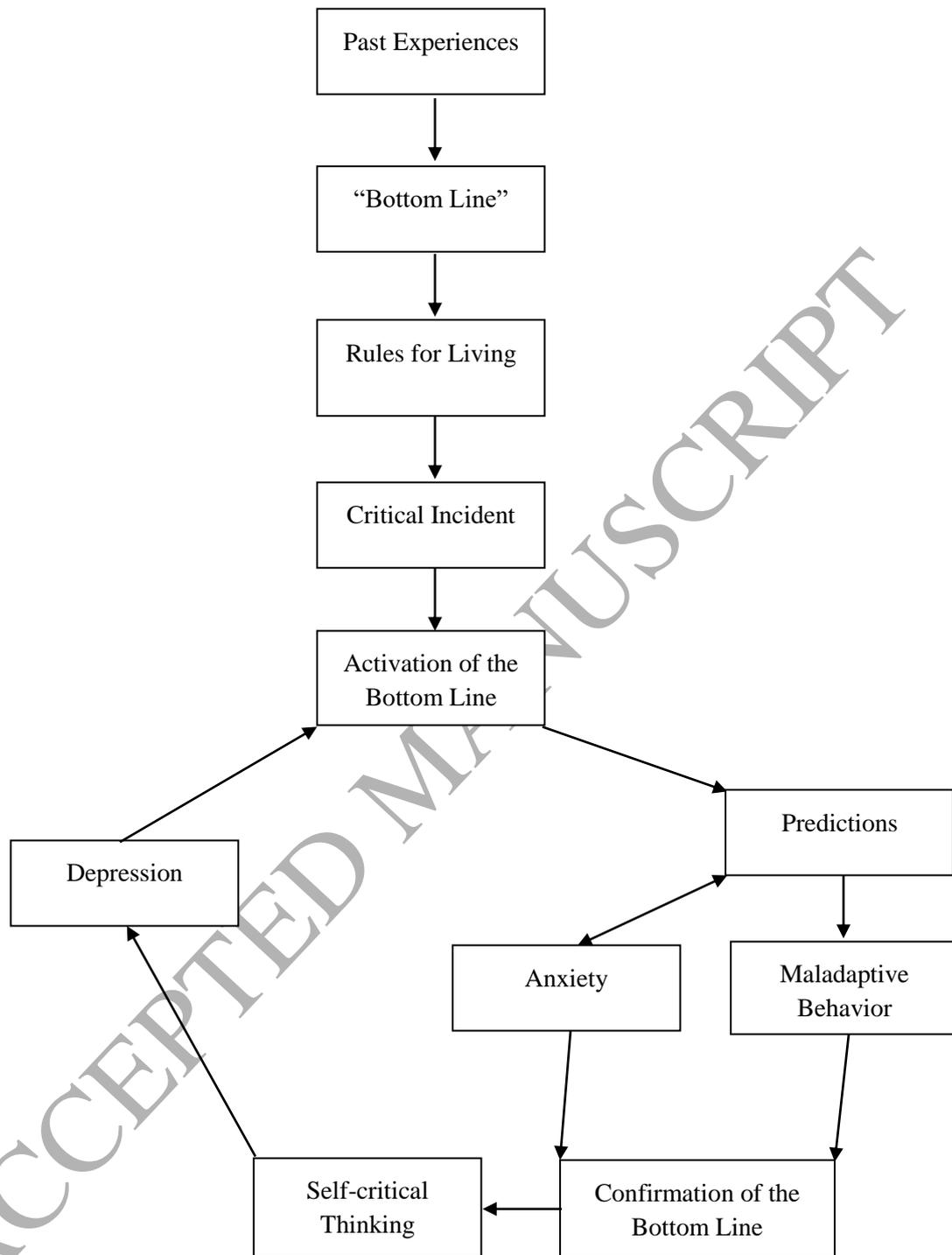
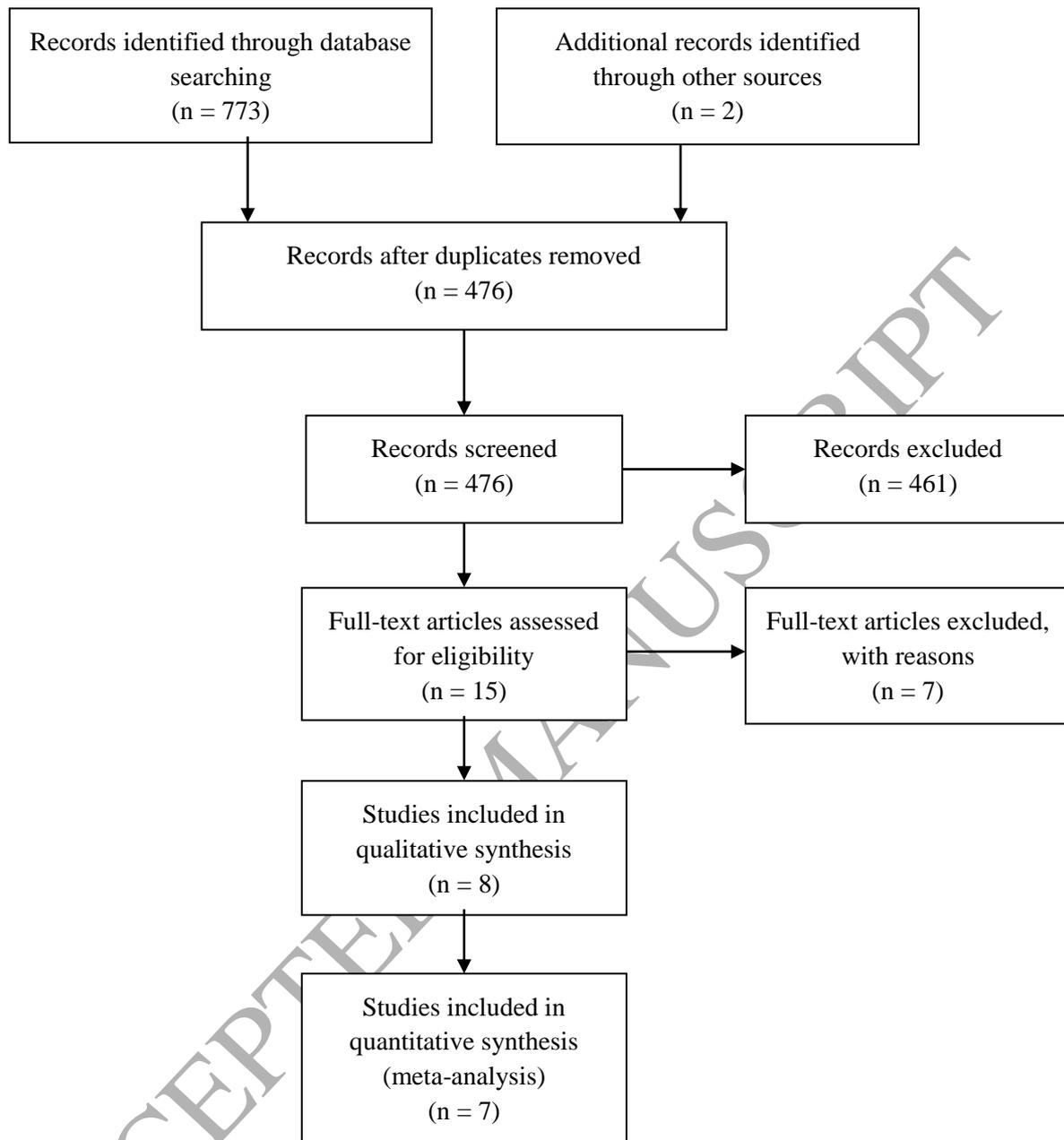


Figure 2: Trial flow.



A Meta-Analysis of Fennell's CBT-Based Interventions for Low Self-Esteem

Table 1. Study characteristics

Study	Year	Design	Country of Study	Primary Self-Esteem Measure	Primary Depression Measure	Intent to treat	Comparison	Hedges' <i>g</i> Pre-Post with 95% CI
Brown et al.	2004	RCT	UK	RSES	BDI	N	WL	0.28 (-0.16, 0.72)
Rigby & Waite	2006	Cohort	UK	RSES	HADS	Y	NA	1.09 (0.83, 1.35)
Morton et al.	2012	Cohort	UK	RSCQ	BDI-II	Y	NA	1.31 (0.92, 1.70)
Waite et al.	2012	RCT	UK	RSCQ	BDI-II	Y	WL	1.94 (0.93, 2.95)
Pack & Condren	2014	Cohort	UK	RSES	PHQ-9	N	NA	1.11 (0.79, 1.43)
Horrell et al.	2014	RCT	UK	RSES	BDI-II	Y	WL	0.35 (0.14, 0.56)
McElhinney et al.	2016	Cohort	UK	RSCQ	BDI-II	Y	NA	1.20 (0.75, 1.65)

Note: RSES = Rosenberg Self-Esteem Scale; BDI = Beck Depression Inventory; RSCQ = Robson Self-Concept Questionnaire; HADS = Hospital Depression and Anxiety Scale; BDI-II = Beck Depression Inventory-II; PHQ-9 = Patient Health Questionnaire; WL = Wait List; NA = Not Applicable

A Meta-Analysis of Fennell's CBT-Based Interventions for Low Self-Esteem

Table 2. Participant characteristics

Study	Year	<i>N</i> in group of interest	Overall <i>N</i> in study	Percent female	Population	Age of participants
Brown et al.	2004	44	104	83	General population	35-44
Rigby & Waite, S.	2006	72	72	71	Depression and anxiety	NS
Morton et al.	2012	49	49	100	Predominantly depression and anxiety	38 (Range=20-58)
Waite, P. et al.	2012	11	22	89	Various disorders in the general population	30.64 (9.24)
Horrell et al.	2014	228	458	80	Depression	44.1 (11.9)
Pack & Condren	2014	90	90	64	Various disorders in the general population	39.5 (Range=23-70)
McElhinney et al	2016	26	26	100	Depression and anxiety	40 (11)

Note: NS = Not Stated

A Meta-Analysis of Fennell's CBT-Based Interventions for Low Self-Esteem

Table 3. Intervention characteristics

Study	Year	Individual/ Group therapy	Number of therapy sessions	Length of intervention	Percent attrition for group of interest to post- treatment	Hours of therapy
Brown et al.	2004	Group	1	1 Day	9% (based on 3- month follow-up)	7
Rigby & Waite, S.	2006	Group	10	10 weeks	NS	20
Morton et al.	2012	Group	8	8 weeks	24%	16
Waite, P. et al.	2012	Individual	10	13.6 weeks	9%	10
Horrell et al.	2014	Group	1	1 Day	16% (based on 3- month follow-up)	7
Pack & Condren	2014	Group	10	10 weeks	49%	15
McElhinney et al.	2016	Group	8	8 weeks	34%	16

Note: NS = Not Stated

Figure 3: The effect of CBT on raising low self-esteem (Weekly Sessions).

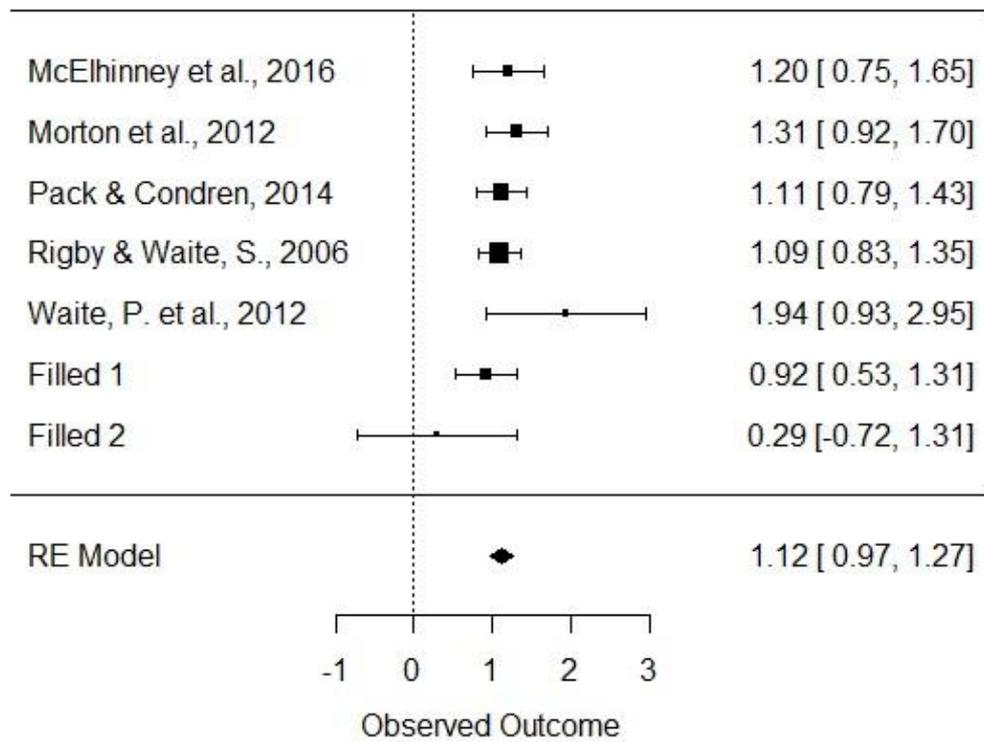
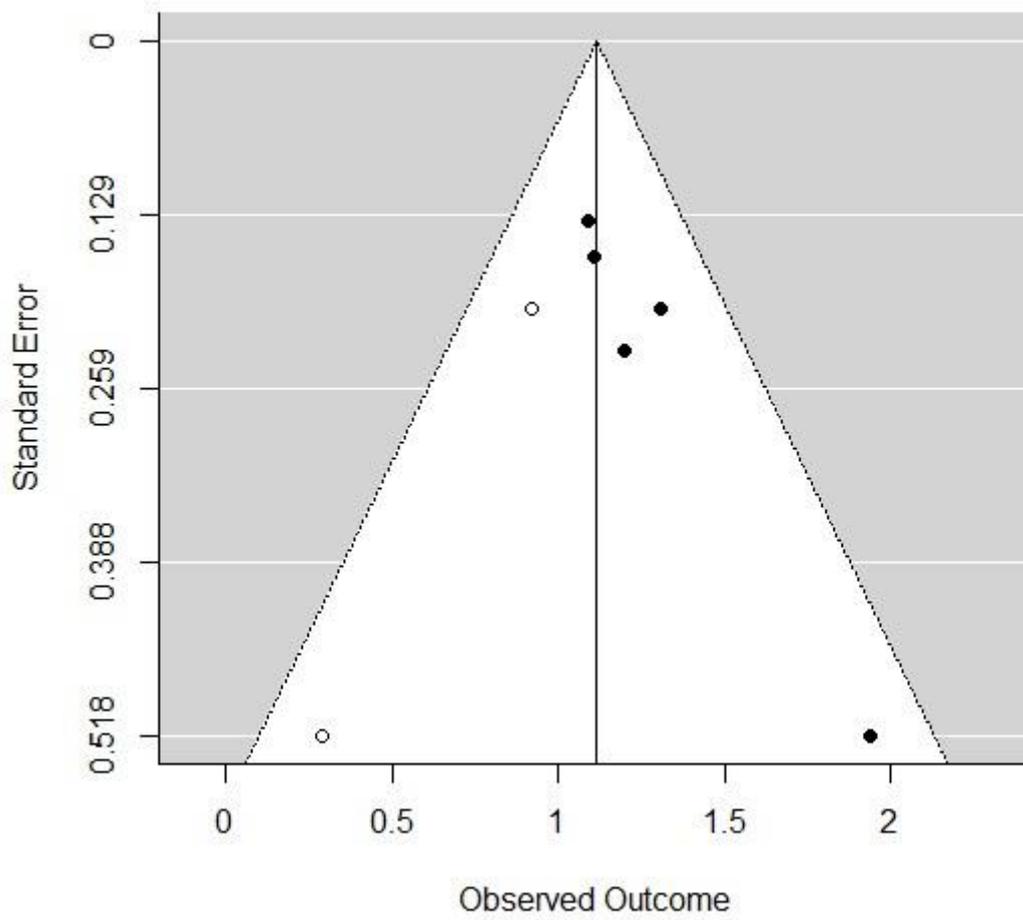


Figure 4: Funnel Plot (Self-Esteem with Weekly Sessions).



ACCEPTED

Figure 5: The effect of self-esteem-based CBT on reducing depression (Weekly Sessions).

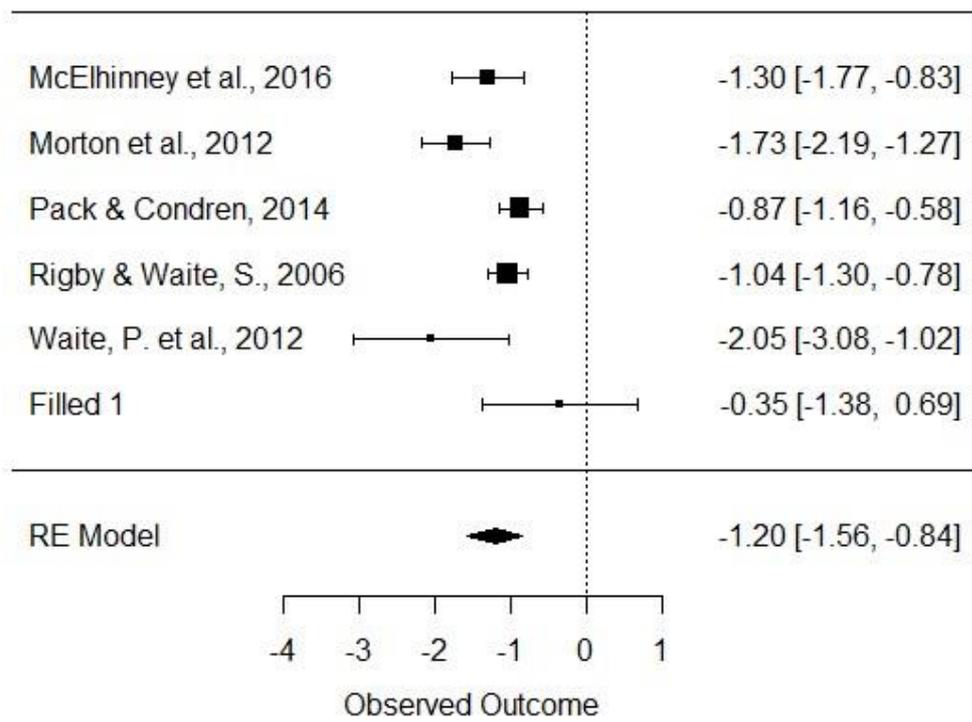
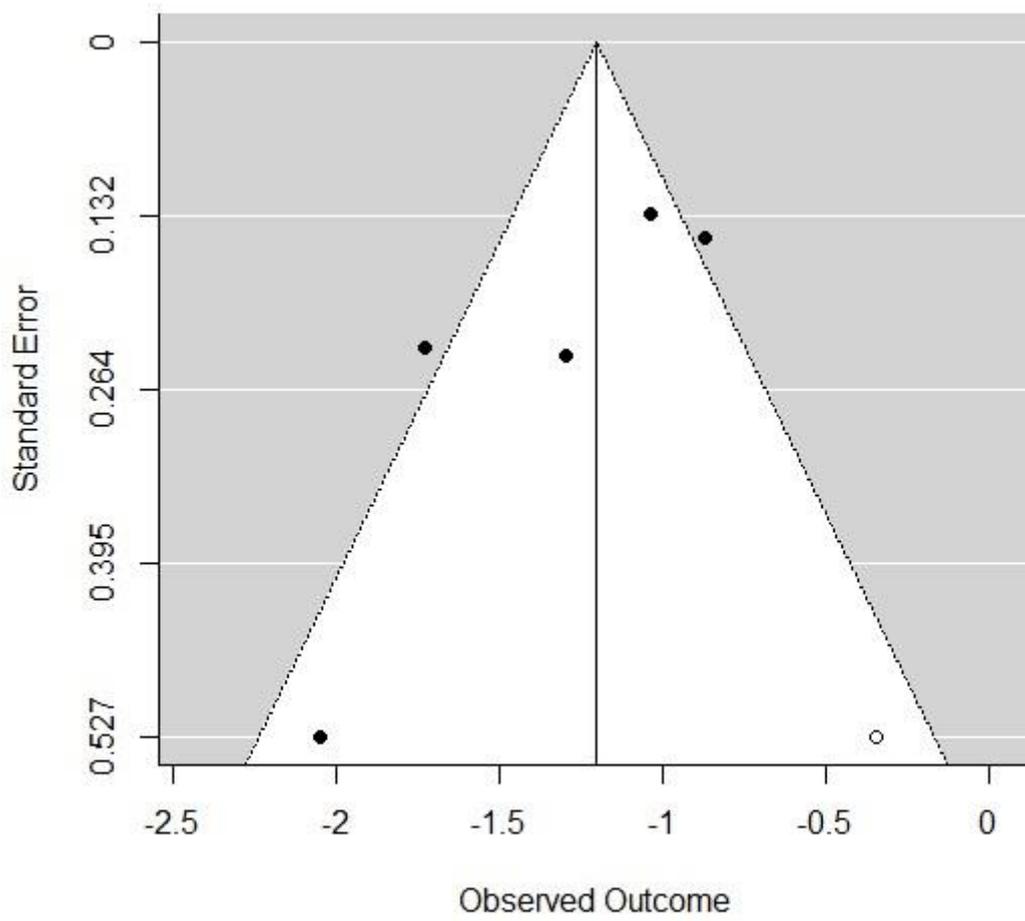
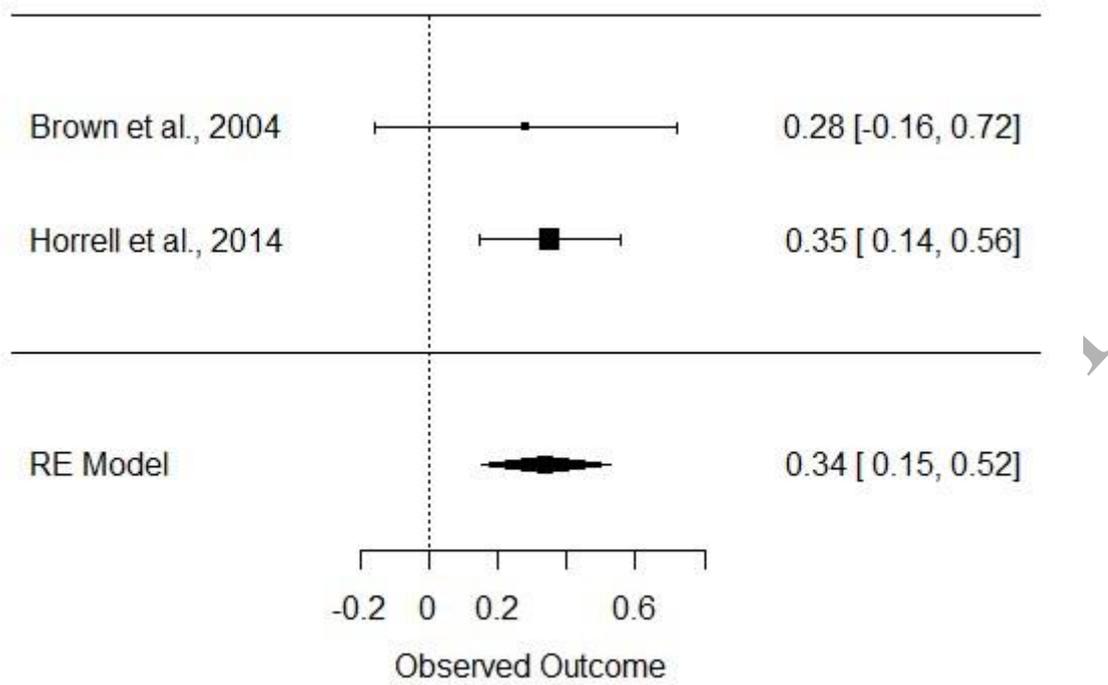


Figure 6: Funnel plot (Depression with Weekly Sessions).



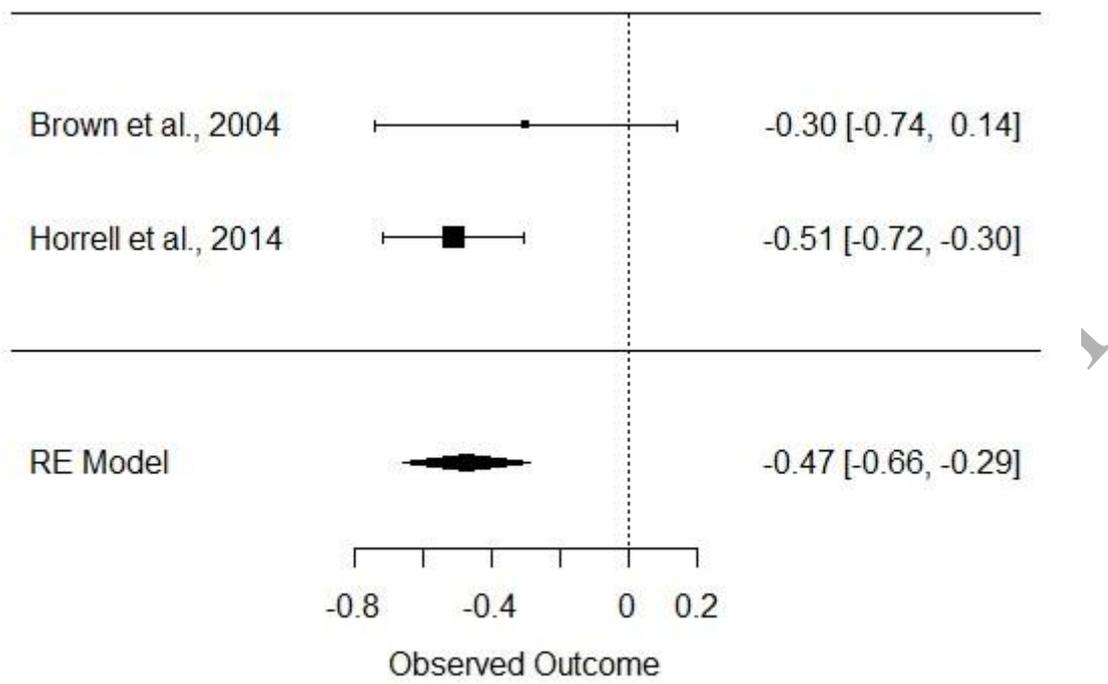
ACCEPTED

Figure 7: The effect of CBT on raising self-esteem (One-Day Workshops).



ACCEPTED MANUSCRIPT

Figure 8: The effect of CBT on reducing depression (One-Day Workshops).



ACCEPTED MANUSCRIPT