**Additional Literature Review**

Up to 47.3% of the OCD population have been reported to meet criteria for OCPD, and comorbid OCPD has been associated with an earlier age of onset, increased severity, and poorer outcomes for OCD (Starcevic et al., 2012). It is therefore important to determine whether comorbid OCPD may adversely impact on treatment outcome for people with OCD. Whilst OCD is argued to be ego-dystonic, which denotes the distressing and unwanted nature of symptoms, OCPD traits tend to be ego-syntonic, rigid and highly valued by the individual (Gordon, Salkovskis, Oldfield, and Carter, 2013). As such, theorists have argued that individuals with OCD and comorbid OCPD may be at risk of poorer outcomes as a result of ambivalence or resistance to treatment if their obsessions align with their personal values, which can reduce motivation to change (Starcevic and Brakoulis, 2013). The number of studies that have found OCPD to be associated with poorer outcomes in OCD raises the question as to whether particular dimensional aspects of OCPD also play a role in OCD treatment response.

Studies that have examined conscientiousness as a predictor of OCD have measured personality according to the Five Factor Model (FFM) via the Revised NEO Personality Inventory (NEO PI-R; Costa and McCrae, 1992). Rector, Richter, Hoody, and Bagby (2002) examined the impact of dimensional conscientiousness in a sample of psychiatric outpatients (*N*=196) in order to determine personality differences between OCD (*n*=98) and major depression (*n*=98). The OCD sample scored low on conscientiousness compared to population norms (Costa and McCrae, 1992), and conscientiousness scores were higher only when compared to the depressed sample. Rector, Richter and Bagby (2005) further examined the impact of personality on a sample of OCD patients (*N*=56), and found that conscientiousness was higher in OCD when not controlling for depression, however scores on conscientiousness were not significantly different when depression was controlled for. This finding suggests that conscientiousness may be, at least in part, a function of comorbid depression rather than only OCD. Further, only one facet of conscientiousness, de­­liberation, was predictive of OCD severity (Costa and McCrae, 1992). It was suggested that whilst individuals with OCD may desire the order and organisation associated with conscientiousness, their own high standards may compromise the achievement of such outcomes (Rector et al., 2005). However, it should be noted that statistical analyses in this study were only conducted in comparison to a depressed group; as such the low conscientiousness scores identified in OCD are as a result of personality profile interpretation, rather than statistical analyses which confirm OCD-specific associations.

Rees, Egan, and Anderson (2005) examined conscientiousness in an OCD group compared with an anxious and depressed non-OCD group. There was no significant difference between groups on the overall conscientiousness domain. However, the competence and self-discipline facets were significantly lower in patients with OCD compared to the anxious and depressed non-OCD patients. In contrast to Rector et al. (2005), this finding suggests that these specific facets traits could be a function of obsessive compulsive symptomology (e.g. high expectations of task performance together with reduced self-perceived competence) as opposed to an association with comorbid anxiety and depressive symptoms (Rees et al., 2005).

Given the limitations associated with categorical diagnoses alone and the dimensional continuum on which personality traits occur, to strengthen our investigation, we considered the impact of both categorical (OCPD diagnosis) and dimensional (conscientiousness) aspects of personality.

**Extended Methodology**

In the original study (Anderson and Rees, 2007), the impact of ERP was indicated by a large magnitude of effect and clinically significant improvements in OCD symptoms in both active treatment conditions relative to waitlist controls.

**Materials**

*Structured Clinical Interview for DSM-IV* (SCID-IV; First, Spitzer, Gibbon and Williams, 1997). The SCID-IV was the primary diagnostic tool for OCD and OCPD.

*Yale Brown Obsessive Compulsive Scale* (YBOCS; Goodman et al., 1989). The clinician administered YBOCS was used to measure the severity of obsessions and compulsions across a total of ten items on a 4-point Likert scale ranging from 0 (no symptoms) to 4 (severe symptoms). The scale is a commonly used measure in OCD research and has demonstrated adequate validity and inter-rater reliability; and good internal consistency, (α=.89; Goodman et al., 1989).

*Revised NEO Personality Inventory* (NEO PI-R; Costa and McRae, 1992). The NEO-PI-R is a self-report tool that measures the ‘big five’ domains of personality. Conscientiousness consists of six facet scales pertaining to ‘competence’, ‘order’, ‘dutifulness’, ‘achievement’, ‘self-discipline’ and ‘deliberation’, which are used as a dimensional measure of this domain. Based on previous evidence of associations with OCD treatment outcome (Rector et al., 2005; Rees et al., 2005), only the competence, self-discipline and deliberation facets were examined in this study. The NEO-PI-R is a widely used measure and the conscientiousness domain has demonstrated good psychometric properties, including excellent internal consistency (α=.92, competence α=.73, self-discipline α=.82, deliberation α=.73; Costa and McRae, 1992).

**Results**

**Descriptive clinical and demographic data**

There were no significant differences on any sociodemographic variables between the OCD only and OCD/OCPD groups: OCD only [age: *M*=32.20, *SD*=12.08], OCD/OCPD [age: *M*=37.36, *SD*=13.6], *t*(44)=–1.2, *p*=.84, 95% confidence interval of the mean difference [CI; -13.83 to 3.51] *d*=–.40; OCD only [gender: female 68.6%], OCD/OCPD [gender: female 72.7%] χ2(1)=0.68, *p*=.80, *w*=.04; OCD only [medication: 68.6%], OCD/OCPD [medication: 63.6%], χ2(1)=.09, *p*=.76, *w*=–.04; OCD only [group arm: 51.4%, individual arm: 48.6%]; OCD/OCPD [group arm: 63.6%, individual arm: 36.4%], χ2(1)=.50, *p*=.48, *w*=–.11.

**Assumption testing**

The assumptions of normality were tested by examining standardised skewness and the Shapiro-Wilks test, which indicated that the data were statistically normal for YBOCS scores. Levene’s test for homogeneity of variance failed to reject the null hypothesis, supporting the assumption of equal variances across the two subsamples, *Levene’s* *F* (44)= .221, *p*=.641. Regarding conscientiousness, the Shapiro-Wilks test indicated that data was approximately normally distributed, with the exception of the competence and self-discipline facet scales, which had a slight positive skew upon visual inspection. A Mann-Whitney U-test indicated that competence scores of the OCD/OCPD participants (*mean rank=*21.90, *n*=10) were not significantly higher than the OCD only group (*mean rank*=20.71, *n=*31), *U=*146.00, *z=*-.27, *p=*.78, *r=*-.04; and the self-discipline scores of the OCD/OCPD participants (*mean rank=*19.30, *n=*10) were not significantly different to the OCD only group (*mean rank*=21.55, *n=*31), *U=*138.00, *z=*-.52, *p=*.60, *r=*-.08.

**Reliable and clinically significant change**

The proportion of patients achieving reliable and clinically significant change was then calculated to determine if post-treatment YBOCS outcome differed based on OCPD comorbidity. Pre-post reliable change index (RCI) scores were computed in accordance with conventions determined by Jacobson and Truax (1991) such that an absolute value of 1.96 or greater was defined as reflecting a real and reliable change, which corresponded to a 10-point change on the YBOCS (see Fisher and Wells, 2005). In the OCD only group (*n*=35), 16 participants (45.7%) experienced a reliable change (improvement) in YBOCS severity at post-treatment. In the OCD/OCPD group (*n*=11), four participants (36.4%) experienced reliable change (improvement) in YBOCS severity. No reliable deterioration in YBOCS severity was observed in either group.

A Fisher’s exact test of the difference between independent proportions, with OCPD diagnosis and statistically reliable change dummy coded as either present or absent for each participant, was then used to evaluate whether or not treatment outcome differed based on the presence of OCPD. The differences in the proportion of participants achieving reliable change between those with and without OCPD was not statistically significant [*p*=.73, two-tailed test]. Due to a lack of appropriate non-clinical, normative reference data for the YBOCS, Fisher and Wells (2005) reviewed a large sample of OCD cases (*n*=300) and applied Jacobson and Truax (1991) methodology to define reliable change as a 10-point YBOCS change, whereby a 10 or more point decrease indicates reliable *improvement*, 10 or more point increase indicates reliable *deterioration,* and variation by less than 9 indicates that an individual has remained *unchanged*. Clinically significant change, which indicates a change from the dysfunctional to the functional range, was defined as a shift from a pre-test YBOCS score above 14 to a post-test score below 14 (Fisher and Wells, 2005). Only individuals meeting both the criteria for reliable and clinically significant change are defined as *recovered.* According to these criteria, 27% *(n*=3) of the OCD/OCPD group and 23% (*n*=8) of the OCD only group were ‘recovered’; 0% (*n*=0) of the OCD/OCPD group and 8% (*n*=23) of the OCD only group were ‘improved’; 73% of the OCD/OCPD group (*n*=8) and 54% (*n*=19) of the OCD only group were ‘unchanged’. No clinically significant deterioration was observed.

**References**

**Anderson, R., & Rees, C. S.** (2007). Group versus individual cognitive-behavioural treatment for obsessive-compulsive disorder: A controlled trial. *Behaviour, Research and Therapy, 45*, 123-137.

**Costa, P. T. and McCrae, R. R.** (1992). Revised NEO Personality Inventory (NEO PI-R)

and NEO Five-Factor Inventory (NEO-FFI) professional manual. Odessa, FL: Psychological Assessment Resources.

**First, M.B., Spitzer, R.L., Gibbon, M., and Williams, J.B.W.** (1997). *Structured Clinical Interview for DSM-IV Axis I disorders (SCID I)*. New York: Biometric Research Department.

**Fisher, P. L., and Wells, A.** (2005). How effective are cognitive and behavioural treatments for obsessive-compulsive disorder? A clinical significance analysis. *Behaviour Research and Therapy, 43*, 1543-1558.

**Goodman, W. K., Price, L., Rasmussen, S. A., Mazure, C., Fleischmann, R. N., Hill, C. L., . . . Charney, D. S.** (1989). The Yale-Brown Obsessive Compulsive Scale: I. Development, Use, and Reliability. *Archives of General Psychiatry, 46*, 1006-1011.

**Gordon, O. M., Salkovskis, P. M., Oldfield, V. B., and Carter, N.** (2013). The association between obsessive compulsive disorder and obsessive compulsive personality disorder: Prevalence and clinical presentation. *British Jounral of Clinical Psychology, 52,* 300-315.

**Jacobson, N. S., and Truax, P.** (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59*, 12-19.

**Rector, N., Hood, K., Richter, M. A. and Bagby, M. R.** (2002). Obsessive-compulsive

disorder and the five-factor model of personality: distinction and overlap with major depressive disorder. *Behaviour* *Research and Therapy, 40*, 1205–1219.

**Rector, N. A., Richter, M. A., & Bagby, R. M.** (2005). The impact of personality on symptom expression in obsessive-compulsive disorder. *The Journal of Nervous and Mental Disease*, *193*, 231-236.

**Rees, C. S., Anderson R. A., Egan, J. S. (2005).** Applying the Five-Factor Model of Personality to the exploration of the construct of risk-taking in obsessive-compulsive disorder. *Behavioural and Cognitive Psychotherapy, 34,* 31-42.

**Starcevic, V., Berle, D., Brakoulias, V., Sammut, P., Moses, K., Milicevic, D., & Hannan,**

1. (2012). Obsessive-compulsive personality disorder co-occurring with obsessive-

compulsive disorder: Conceptual and clinical implications. *Australian & New Zealand*

*Journal of Psychiatry, 47,* 65-73.

**Starcevic, V., & Brakoulis, V.** (2013). New perspectives on obsessive compulsive

personality disorder and its links with other conditions. *Current Opinion In*

*Psychiatry, 27,* 62–67.