Personality and Group Psychotherapy Outcome: The Lack of Influence of Traits from the Five-Factor Model

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Group Dynamics Theory Research and Practice

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Abstract

Although there is accumulating evidence of the importance of personality in predicting group psychotherapy outcomes, the extent to which Big Five personality traits predict group psychotherapy outcomes is debatable. Thus far, findings from individual treatment studies suggest Big Five traits have a marginal-to-small impact on the success of psychotherapy. Yet, results from the handful of group therapy studies on Big Five traits are equivocal. Moreover, extant research on Big Five traits and group treatment outcomes do not address potential dependencies in their data and, despite conducting multiple significance tests, neglect to correct for an inflated Type I error rate. **Objective:** We addressed these limitations through the largest, most methodologically rigorous investigation of the extent to which Big Five traits predict group treatment outcomes to date. **Method:** Recently discharged patients with mental health problems ($N = 128$; $M_{age} = 41.7$, $SD = 11.6$) receiving short-term group therapy completed a measure of Big Five traits (NEO Personality Inventory-Revised) at pre-treatment and measures of depression symptoms (Beck Depression Inventory) and anxiety symptoms (Beck Anxiety Inventory) at pre-treatment, post-treatment, and six-month follow-up. To address potential dependencies, we adopted a multi-level modeling strategy and, to address the multiple comparison problem, we used the Benjamini-Hochberg procedure. **Results:** None of the Big Five traits predicted smaller or greater reductions in depression or anxiety symptoms at post-treatment or six-month follow-up. **Conclusion:** We found no evidence that the Big Five traits were associated with group psychotherapy outcome.

Keywords: group psychotherapy, five-factor model, big five, treatment, outcome

Highlights and Implications

- To investigate the influence of personality traits on group psychotherapy outcome we assessed traits from the Big Five Model of personality at pre-treatment and depression and anxiety symptoms at pre-treatment, post-treatment, and six-month follow-up in recently discharged patients receiving group Cognitive Behavioral psychotherapy.

- Multilevel modeling indicated that Big Five traits did not significantly influence symptom reduction at post-treatment or six-month follow-up.

- Considering the methodological shortcoming of prior research alongside our null findings the claimed clinical utility of Big Five traits on group treatment outcomes remains unsubstantiated.

- The present study represents the largest, most methodologically rigorous test of the impact of Big Five traits on group treatment outcomes to date.

Personality and Group Psychotherapy Outcome:

The Influence of Big Five Traits

The focus of much psychotherapy research over the past several decades has been on demonstrating the effectiveness and efficacy of various forms of therapy based on groups defined by symptoms or specific diagnoses (Lambert, 2013). This approach rests on an assumption known as the patient uniformity myth, which assumes patients with the same diagnosis are virtually identical (Kiesler, 1966). However, it is increasingly apparent that to maximize the quality of the psychotherapy, treatments need be tailored to the individual, not their diagnosis (e.g., Blatt, 1999; Blatt et al., 2006; Norcross & Wampold, 2011). Psychotherapies that emphasize symptom reduction without accounting for and addressing the person not only increase the chance of a poor treatment outcome (Hewitt et al., 2008, 2020) but the risk of relapse (Blatt et al., 2006) and dropout (McCown & Carlson, 2004).

Indeed, research suggests the treatment outcome can be influenced negatively by personality factors including psychoticism and impulsiveness (Müller et al., 2008), grandiose narcissism and rejection of others (Conte et al., 1991; Ogrodniczuk et al., 2009), and trait and other components of perfectionism (Enns et al., 2002; Hewitt et al., 2017, 2020; McCown & Carlson, 2004). Yet, though there is evidence that some personality factors confer risk for a poor treatment outcome, there is much to learn about the relevance of other personality factors. In the present study, we address this by testing the extent to which pre-treatment levels of personality traits included in the Big Five Model influence reductions in depression and anxiety symptoms at post-treatment and six-month follow-up in recently discharged patients receiving group Cognitive Behavioral Therapy (CBT) for residual symptoms of depression.

Personality and Treatment Outcome

As of late, there has been a resurgence in research on the relevance and extent of influence of patient personality factors on treatment-related issues (Blatt & Zuroff, 2005; PDM Task Force, 2006) and outcomes (Hewitt et al., 2020). Existing work suggests personality factors impact the efficacy of psychotherapy and that assessing patient personality and understanding the influence of patient personality on psychotherapy may have more relevance in the successful treatment of psychological disorders compared to the exclusive focus on psychological symptoms (Blatt & Zuroff, 2002; Hewitt et al., 2008). For example, one personality factor that has been proposed to have a negative impact on psychotherapy outcomes if not focused upon directly is perfectionism (Hewitt et al., 2018, 2020, in press). Namely, Hewitt and colleagues (2018) proposed the interpersonal difficulties experienced and created by perfectionistic individuals will hinder the therapeutic alliance and, thus, impede treatment. This was demonstrated empirically in Hewitt et al. (2020) (also see Enns et al., 2002; McCown & Carlson, 2004; Nobel et al., 2012) who reported that various components of perfectionism were associated with lower reductions in post-treatment symptoms following group therapy. Furthermore, Hewitt et al. (in press) suggested and found evidence that these components of perfectionism are associated with therapists' negative evaluations and dislike of patients.

However, although there is accumulating evidence that some personality variables and processes can negatively impact treatment, it is important to assess other personality factors that might have such an impact. One model that has received extensive use is the Big Five Model. Decades of evidence attest to the validity and reliability of the five Big Five traits over time and across an impressive array of cultures (e.g., Costa et al., 2005; McCrae & Terracciano, 2005) and instruments (e.g., Widiger et al., 2002; Suzuki et al., 2017). Moreover, Big Five traits predict a wide range of consequential outcomes in non-clinical populations, including physical and

psychological health and mortality (see Ozer & Benet-Martinez, 2006 for review). That said, there remains much to learn about the clinical utility of Big Five traits concerning treatment outcomes in clinical populations (Bagby et al., 2016).

The Big Five Model and Treatment Outcome in Psychotherapy

Traits included in the Big Five Model—Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness—are thought by some to provide an all-embracing framework for understanding normal and disordered personality (e.g., Markon et al., 2005). Some researchers also believe clinical psychology should move towards a diagnostic system based on the Big Five traits (e.g., Widiger et al., 2002). Likewise, some researchers maintain that Big Five traits could prove useful for treatment planning (Bagby et al., 2016; Harkness & Lilienfeld, 1997) and some clinicians rate dimensional personality models based on the Big Five as more useful than DSM-based models for personality disorders (e.g., Morey et al., 2014). To this end, there have been several attempts to test the influence of Big Five traits on treatment outcomes and, in a recent meta-analysis, Bucher et al. (2019) concluded lower Neuroticism and higher Extraversion, Openness to Experience, Agreeableness, and Conscientiousness generally predict more favorable treatment outcomes.

However, the Big Five Model has faced some criticism regarding its relevance to psychotherapy (e.g., Coolidge et al., 1994; Shedler & Westen, 2004, 2007; Spitzer et al., 2008). Moreover, though Bucher et al. (2019) makes an important contribution to the literature, a close inspection reveals three limitations. First, the overall effects reported were obtained by synthesizing legitimate BFM measures, such as the NEO Personality Inventory-Revised (NEO-PI-R; Costa & McCrae, 1992), with measures not intended to assess the Big Five traits, such as the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1951). On the

one hand, there is some factor-analytic evidence suggesting scales such as the MMPI map onto the Big Five Model (Trull et al., 1995). On the other hand, Pace and Brannick (2010) presented meta-analytic evidence that even among measures specifically intended to assess the Big Five traits there are significant differences. Second, non-clinical samples were combined with clinical samples without testing for potential differences. Third, the studies included in Bucher et al.'s (2019) analysis were exclusively individual treatments. Consequently, the generalizability of Bucher et al.'s (2019) findings for group psychotherapy research involving patients with definitively diagnosed mental health disorders is unclear. Group therapy is not only as effective as individual psychotherapy (Burlingame et al., 2013), but provides a situation where the interplay of each patient's personality has crucial implications for treatment effectiveness (Hewitt et al., 2017; Tasca et al., in press; Yalom & Leszcz, 2005).

Extant Research on Big Five Traits and Group Psychotherapy Outcome

Several studies have examined the influence of Big Five traits on the group psychotherapy outcome. Ogrodniczuk et al. (2003) studied outpatients with complicated grief who received interpretive or supportive short-term group therapy and tested the extent to which Big Five traits predict reductions in general symptoms (a composite of anxiety, depression, interpersonal distress, self-esteem, general symptom distress, social role dysfunction, and physical dysfunction). Results revealed that when Extraversion, Neuroticism, and Conscientiousness were examined simultaneously, only Extraversion predicted general symptoms at post-treatment, with higher levels of Extraversion associated with a more favorable outcome. Talbot et al. (2003) studied a small sample of women with childhood histories of sexual abuse receiving either group recovery-focused therapy or 'treatment-as-usual' (i.e., individual, group, family, and somatic therapy). Unlike Ogrodniczuk et al. (2003), Talbot et al.

(2003) reported that patients with higher levels of Extraversion receiving group recovery therapy or 'treatment-as-usual' experienced smaller, not greater, reductions in symptoms at six-months follow-up. Additionally, they found that patients with higher Agreeableness who received group recovery therapy tended to have greater reductions in post-treatment symptoms, whereas patients with higher Agreeableness receiving 'treatment-as-usual' tended to experience lower reductions in post-treatment symptoms. In contrast, at six-months follow-up, higher levels of Agreeableness were associated with lower symptom reduction for patients regardless of treatment type. Lastly, Spek et al. (2008) studied patients receiving group CBT or online self-help for subthreshold depression. Their results implied that for both treatments, only Neuroticism was a significant predictor of depression symptoms at post-treatment, with higher levels of Neuroticism associated with a poorer outcome. Considering these findings together, the clinical utility of Big Five traits in predicting the group treatment outcome is unclear.

One reason for the lack of clarity may be due to the several shortcomings that need to be addressed to advance understanding of the extent to which Big Five traits influence the group psychotherapy outcome. First, in group therapy, it is rare for patient observations to be entirely independent of their group due to members of the same group sharing a common treatment history. Consequently, the average correlation between variables measured in patients from the same group is usually higher than the average correlation between patients from different groups. When this occurs, the assumption of independent observations that underlies traditional statistics is violated, and the likelihood of reporting spuriously significant results increases (Hox, 2010). Now, to underscore why violating the assumption of independent observations is problematic, consider Baldwin et al. (2005). These authors reviewed 33 group therapy studies that did not adjust for the possible dependence and found that, after adjusting for dependence, almost all

results initially reported as significant were no longer significant. Consequently, in Tasca et al.'s

(2009) recommendations for group therapy research, they underscore that it is essential to assess

and adjust for potential dependence. Despite this, extant research on Big Five traits and group

treatment outcomes do not account for or address potential dependence, which makes it difficult

to determine the extent to which their findings are spurious.

Second, a related, more basic issue concerns the need to guard against an increased false-

positive rate when conducting multiple significance tests (McDonald, 2009). Though this issue

has been known for decades (e.g., Petrinovich & Hardyck, 1969), much of the literature on Big

Five traits and group treatment outcomes conducts multiple significance tests without adjusting

for an inflated false discovery rate, which further increases the likelihood of spurious

significance (McDonald, 2009)[1]. Lastly, a limitation of the broader treatment outcome literature

is a lack of replication studies (Arntz et al., 2015).

The Present Study

Against this background, we aimed to advance understanding of the extent to which the

five traits included in the Big Five Model predict reductions in depression and anxiety symptoms

at post-treatment and six-month follow-up in recently discharged patients receiving group CBT

psychotherapy. Additionally, we aimed to methodologically improve extant studies on the role of

Big Five traits in group treatment outcomes by adopting a multilevel data analytic strategy to

account for and address potential dependencies in our data and by using the Benjamini-Hochberg

procedure to guard against an increased false discovery rate stemming from the multiple

comparison problem. Based on theory and evidence that depression and anxiety are an enduring

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[1]Ogrodniczuk et al. (2003) acknowledged this problem when they noted that if they had addressed the multiple comparison problem, several of their significant findings would no longer be significant. Accordingly, they suggested caution in interpreting their findings.

form of psychological distress (Hopwood et al., 2013), we hypothesized the rank-order stability

of depression and anxiety symptoms would be high. However, due to inconsistent findings and

the aforementioned methodological issues, we did not have any expectations regarding whether

Big Five traits predict lower or greater symptom reduction following group psychotherapy.

Method

Participants

Our sample is part of a larger archival dataset that was initially reported in [Masked]. A

total of 128 patients (65.6% women; 34.4% men; 0% transgender; 0% non-binary) completed

pre- and post-treatment measures. To be eligible for group therapy patients had to have been

discharged from an inpatient care facility for an affective disorder within the past two months.

Patients averaged 41.7 years of age ($SD = 11.6$; range 19-75) and most resided in [Masked for

blind review] (78.1%). Overall, 57.0% of patients had no children, 20.3% had one child, 14.8%

had two children, 6.3% had three children, and 1.6% had four children. Likewise, 44.5% of

patients were single, 28.9% were separated, divorced or widowed and 26.2% were married, in a

common-law relationship, living with a same-sex partner or in a committed relationship; 35.9%

of patients were unemployed, 27.4% were on disability leave, 18.1% worked either part or full

time, 9.4% were on sick leave, 4.7% were retired, 2.3% were homemakers, 1.6% were students,

and the remaining 0.6% did not report their occupational status. In total, 90% of patients were

Caucasian, 9.1% were Asian, and 0.8% were African Canadian.

At intake, patients averaged 1.8 lifetime hospitalizations ($SD = 1.6$; range 0-9). Most

patients (91.3%) were on an antidepressant, an anxiolytic, or both. As assessed by the Structured

Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders-IV (SCID-I; First et

al., 1997), 72.7% of patients received a diagnosis of Major Depressive Disorder. At post-

treatment, data were obtained from 23 groups, with an average of 5.6 patients ($SD = 2.4$) per group providing data. At six-month follow-up, data were obtained from 22 groups, with an average of 3.9 patients ($SD = 1.8$) per group providing data.

Measures

Big Five Personality Traits

      Big Five personality traits were measured at pre-treatment using the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992). The NEO-PI-R is a 240 item self-report measure of Neuroticism (e.g., "In dealing with other people, I always dread making a social blunder"), Extraversion (e.g., "I am a very active person"), Openness (e.g., "I often try new and foreign foods"), Conscientiousness (e.g., "I am a productive person who always gets the job done"), and Agreeableness (e.g., "I tend to be cynical"). Patients responded to the NEO-PI-R using a 5-point rating scale from 0 (*strongly disagree*) to 4 (*strongly agree*). The NEO-PI-R is the most widely validated measure of Big Five traits, and its reliability and validity are well-established (e.g., Costa et al., 2005; Costa & McCrae, 1992).

Depression Symptoms

      Depression symptoms were assessed at pre-treatment, post-treatment, and follow-up using the Beck Depression Inventory (BDI; 21-items; Beck et al., 1988a). Each BDI item consists of a depression symptom (e.g., sadness) ranging from 0 (*no depression symptom*) to 3 (*severe depression symptom*). The BDI is a widely used measure of depression, and ample evidence supports its predictive, convergent, discriminant and incremental validity, as well as its internal consistency (Beck et al., 1988a; Brown et al., 1995).

Anxiety Symptoms

      Anxiety symptoms were assessed at pre-treatment, post-treatment, and follow-up using

the Beck Anxiety Inventory (BAI; 21-items; Beck et al., 1988b). Each BAI item consists of an

anxiety symptom (e.g., nervous) ranging from 0 (*not at all*) to 3 (*it bothered me a lot*). Beck et al.

(1988) reported the BAI had a Cronbach's alpha of .92 and a 1-week test-retest reliability of .75.

Beck et al. (1998b) also reported that the BAI was strongly correlated with the revised Hamilton

Anxiety Rating Scale ($r = .50$; Hamilton, 1959).

Procedure

Ethical approval for our study was obtained from the University of [Masked] Research

Ethics Board. Patients were referred to the group therapy program by staff from four psychiatric

inpatient units within two months of being discharged from an inpatient care facility for an

affective disorder. Participants were assigned to treatment groups based on availability. Informed

consent and pre-treatment measures were completed as part of an initial assessment. Post-

treatment measures were completed following the last group therapy session and follow-up

measures were completed 6-months later.

Group Therapy Format

Participants completed the Changeways Core program, which is described in detail in

Patterson et al., (2008). Briefly, the Changeways Core program is a group treatment protocol

developed to reduce depression symptoms and involves CBT and psychoeducational

information. The group therapy sessions occurred once per-week for ten consecutive weeks.

Each group was comprised of eight to fifteen patients and each session was led by a registered

psychologist and co-led by either a nurse or pre-doctoral psychology intern. Following the

commencement of treatment, no new members were able to join the group. Out of 10 weekly

sessions, 66.4% of patients missed no sessions, 26.6% missed one session, 4.7% missed two

sessions, 1.6% missed three sessions, and 0.8% missed four sessions.

Data Analytic Strategy

To determine the extent to which patients experience reliable and clinically significant improvements in depression and anxiety symptoms we calculated the reliable change index (RCI) using Criterion C (Jacobson & Truax, 1991). For these calculations, we used the normative clinical and general reference group data and test-retest reliabilities reported in Nietzel et al. (1987), Beck et al. (1988a, 1988b) and Osman et al. (1997).

Next, to evaluate the extent to which Big Five traits predict change in depression symptoms and anxiety symptoms at post-treatment and follow-up, we followed Tasca and Gallop's (2009) recommendations for group therapy research. Namely, we adopted a strategy of testing increasingly complex models to arrive at the one that most accurately captures our data. First, we tested intercept-only models with only post-treatment or follow-up depression symptoms, or post-treatment or follow-up anxiety symptoms included. Next, we tested fixed-effect models with Big Five traits as predictors and pre-treatment levels of the outcome included as a covariate. Subsequently, we tested random intercept and slopes models in which the slopes of regression coefficients could differ between groups. To determine whether a fixed-effect or a random intercept and slope model was most appropriate, we used the deviance statistic to perform a formal chi-square difference test ($\Delta\chi^2$) to evaluate whether the inclusion of regression slopes yielded a significant improvement in fit (see Hox, 2010). We also took the Akaike Information Criterion (AIC) values into consideration. Models with smaller AIC values are generally preferable to models with larger AIC values (Hox, 2010). To facilitate interpretation and to reduce potential collinearity, explanatory variables were grand mean centered (Hox, 2010). All multi-level analyses were conducted in Mplus version 7.2. (Muthén & Muthén, 2012) using full information maximum likelihood estimation.

Finally, to guard against increased false positives resulting from multiple significance tests, we used the Benjamini-Hochberg procedure (Benjamini & Hochberg, 1995). The Benjamini-Hochberg procedure is a sequential approach to controlling the false discovery rate in multiple comparisons that yields greater power than the Bonferroni correction (Thissen et al., 2002). If the initial p-value is smaller than the Benjamini-Hochberg critical p-value, it suggests significance ($p < p_{critical}$); if the initial p-value is equal to or larger than the Benjamini-Hochberg critical p-value value, it suggests non-significance ($p \geq p_{critical}$).

Power Analysis

Prior to conducting our planned multilevel analysis, we conducted a power analysis using Optimal Design (Raudenbush et al., 2011) to gauge our ability to detect small, medium, and large effect sizes (i.e., $\delta = .20, .50, .80$, respectively). For a small intraclass correlation coefficient of .05 (Hewitt et al., 2020), an alpha of .05, six participants per group, and 23 groups, power was 97.3% for a large effect, 68.1 for a medium effect, and 16.5 for a small effect. Additionally, for a small intraclass correlation coefficient of .05 (Hewitt et al., 2020), an alpha of .05, four participants per group and 22 groups, power was 87.8 for a large effect, 50.2 for a medium effect, and 2.4 for a small effect. Accordingly, our planned multilevel analyses appear adequately powered to detect large, but not moderate or small, effects.

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Results

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Descriptive Statistics, Bivariate Correlations, and Reliable Change

Less than 5% of data points were missing. Bivariate correlations, means, standard deviations, and intraclass correlation coefficients are in Table 1[2]. The mean BDI score was 25.5 ($SD = 12.7$), which implies that the average participant was experiencing moderate depression

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[2]Our archival dataset did not contain item-level scores. As such, we were unable to calculate Cronbach's alpha.

symptoms (Beck et al., 1988a). In contrast, the mean BAI score was 19.5 (SD = 13.4), which

indicates that the average participant was experiencing low anxiety symptoms (Beck et al.,

1988b). Following Cohen's (1992) guidelines for small, medium, and large effects (r = .10, .30,

.50, respectively), Neuroticism had moderate positive relationships with depression symptoms

and anxiety symptoms at pre-treatment, post-treatment, and six-month follow-up (r = .39 to .47).

In contrast, Agreeableness had a small negative relationship with depression symptoms and

anxiety symptoms at post-treatment (r = –.21 to –.26). Gender did not correlate significantly (p <

.05) with any variable of interest, whereas age had a moderate negative relationship with

Neuroticism (r = .30), a small negative relationship with Openness to Experience (r = .29), and a

small positive relationship with Conscientiousness (r = .24)[3]. Depression and anxiety symptoms

displayed moderate to strong rank-order stability (r = .49 to .66) and the intraclass correlations

ranged from .01 to .06, suggesting marginal intragroup dependence (Hox, 2010).

     RCI analysis indicated that for pre-treatment to post-treatment depressive symptoms, 48

patients (40.3%) made reliable improvements, 62 patients (52.1%) made no reliable change, and

9 patients (7%) deteriorated. Likewise, for pre-treatment to follow-up depressive symptoms, 38

patients (50.7%) made reliable improvements, 32 patients (42.7%) made no reliable change, and

5 patients (6.7%) deteriorated. In contrast, regarding pre-treatment to post-treatment anxiety

symptoms, 20 patients (15.6%) made reliable improvements, 106 patients (82.8%) made no

reliable change, and 2 patients (1.6%) deteriorated. Similarly, for pre-treatment to follow-up

anxiety symptoms, 12 patients (14.8%) made reliable improvements, 65 patients (80.2%) made

no reliable change, and 4 patients (4.9%) deteriorated. Finally, at post-treatment 27 patients

(21.1%) met criteria for clinically significant improvements in depressive symptoms and 11

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[3]The inclusion of age as a covariate yielded no substantive difference in findings (see Supplemental Material Table A1 to A4).

patients (8.6%) met criteria for clinically significant improvements in anxiety symptoms. At

follow-up, 29 patients (38.7%) met criteria for clinically significant improvements in depressive

symptoms, and 7 patients (8.6%) met criteria for clinically significant improvements in anxiety

symptoms.

Multilevel Modeling

Results for models with post-treatment depression symptoms as the outcome are in Table

2 and results for models with six-month follow-up depression symptoms as the outcome are in

Table 3. Allowing regression coefficients to differ across groups did not yield a significant

improvement in fit for the model predicting post-treatment depression symptoms, $\Delta\chi^2(5) = 1.16$,

$p = .949$, or the model predicting follow-up depression symptoms, $\Delta\chi^2(5) = 0.12$, $p = .999$. The

variance of the slopes was consistently non-significant, and the AIC was smaller for the fixed

effect models relative to the random intercept and random slope models (see Table 2 and Table

3). Consequently, we selected and interpreted fixed effects models. Neuroticism ($\beta = .14$, $p =$

.146, $p_{critical} = .05$), Extraversion ($\beta = .01$, $p = .876$, $p_{critical} = .225$), Openness to Experience ($\beta = -$

.11, $p = .165$, $p_{critical} = .075$), Agreeableness ($\beta = -.10$, $p = .193$, $p_{critical} = .088$), and

Conscientiousness ($\beta = .09$, $p = .285$, $p_{critical} = .125$) did not predict change in post-treatment

depression symptoms (see Table 2). Likewise, Neuroticism ($\beta = .18$, $p = .212$, $p_{critical} = .100$),

Extraversion ($\beta = .08$, $p = .432$, $p_{critical} = .163$), Openness to Experience ($\beta = -.19$, $p = .073$, $p_{critical}$

= .025), Agreeableness ($\beta = .08$, $p = .445$, $p_{critical} = .188$), and Conscientiousness ($\beta = .04$, $p =$

.747, $p_{critical} = .200$) also did not predict change in follow-up depression symptoms (see Table 3).

Findings for models predicting post-treatment anxiety symptoms are in Table 4 and

findings for models predicting follow-up anxiety symptoms are in Table 5. The inclusion of

regression slopes did not yield a significant improvement in fit for either the model predicting

anxiety symptoms at pre-treatment, $\Delta\chi^2(5) = 0.45$, $p = .993$, or the model predicting anxiety symptoms at follow-up, $\Delta\chi^2(5) = 4.04$, $p = .544$. Additionally, the variance of the slopes were non-significant and the AIC for the fixed effect models were smaller than the AIC for the random intercept and random slope models (see Table 4 and Table 5). As such, we selected fixed effects models. Neuroticism ($\beta = -.01$, $p = .930$, $p_{critical} = .250$), Extraversion ($\beta = .01$, $p = .910$, $p_{critical} = .238$), Openness to experience ($\beta = -.07$, $p = .271$, $p_{critical} = .113$), Agreeableness ($\beta = -.12$, $p = .066$, $p_{critical} = .013$), and Conscientiousness ($\beta = -.06$, $p = .439$, $p_{critical} = .175$) did not predict change in post-treatment anxiety symptoms (see Table 4). Similarly, Neuroticism ($\beta = .13$, $p = .307$, $p_{critical} = .138$), Extraversion ($\beta = .14$, $p = .149$, $p_{critical} = .063$), Openness to Experience ($\beta = -.14$, $p = .128$, $p_{critical} = .038$), Agreeableness ($\beta = .02$, $p = .826$, $p_{critical} = .213$), and Conscientiousness ($\beta = -.09$, $p = .383$, $p_{critical} = .150$) did not predict change in follow-up anxiety symptoms (see Table 5).

Discussion

To what extent do Big Five traits influence group treatment outcomes? To date, inconsistent findings and methodological shortcomings have precluded an answer. We addressed this by using multilevel modeling to test the extent to which Big Five traits predict change in depression symptoms and anxiety symptoms at post-treatment and six-month follow-up in recently discharged patients receiving short-term group CBT for residual symptoms of depression. As hypothesized, depression symptoms and anxiety symptoms displayed strong rank-order stability. Results also revealed that none of the Big Five traits predicted change in depression symptoms or anxiety symptoms at post-treatment or six-month follow-up.

An Improved Understanding of the Big Five Traits and Group Treatment Outcomes

Whereas prior research suggests Big Five traits can influence group treatment outcomes,

we found no evidence that Big Five traits influence depression or anxiety symptoms following

group psychotherapy. One explanation for this discrepancy is that unlike the present study, prior

research on Big Five traits and group treatment outcomes did not correct for possible dependence

or guard against the multiple comparison problem—both of which increase the likelihood of

spurious significance (Hox, 2010; Tasca & Gallop, 2009; Tasca et al., 2009). Another

explanation is we used the 260-item NEO-PI-R, whereas prior research used the shorter 60-item

NEO-FFI. Alternatively, the number of patients in our study was greater than the number of

patients in previous research, which may have allowed us to more accurately detect the influence

of Big Five traits on group treatment outcomes.

Regardless, considering the need to interpret prior findings on Big Five traits and group

treatment outcomes cautiously due to their methodological shortcomings alongside our null

findings, clinicians should view the claimed relevance of Big Five traits to group psychotherapy

outcomes with skepticism. Put differently, non-significance is, of course, weak evidence and the

absence of evidence is not evidence of absence. That said, the burden of proof does not fall on

the rejecter. And until presented with methodologically sound evidence that Big Five traits do

influence group treatment outcomes, our answer to whether Big Five traits are relevant to group

psychotherapy should remain 'it might, but we have no evidence that it does'.

Lastly, according to some researchers, Big Five measures that assess normal personality

structure, such as the NEO-PI-R, are ill-equipped to tackle clinical issues due to their broad

nature (e.g., Shedler & Westen, 2004; Shedler, 2015; Spitzer et al., 2008). Additionally, despite

the overlap between Big Five measures and the Personality Inventory for DSM-5 (PID-5;

Krueger et al., 2012), Suzuki et al. (2017) found the PID-5 had higher item response thresholds

and provided more information at upper levels. Thus, our null findings might reflect our use of a

measure of normal Big Five personality (i.e., NEO-PI-R) as opposed to a measure of

pathological Big Five personality (e.g., PID-5). Alternatively, some authors maintain that Big

Five measures indented for use in normal populations fail to capture personality syndromes seen

in clinical practice (Spitzer et al., 2008) and there is meta-analytic evidence that the Big Five

traits only explain a small amount of variance in individual treatment outcomes (Bucher et al.,

2019). This is not to say we think dimensional models of patient personality have no place in

psychotherapy. Given the decades of theory and evidence underscoring the importance of

tailoring psychotherapies to the individual, such a claim would be untenable (e.g., Blatt, 1999,

Blatt et al., 2006; Norcross & Wampold, 2011). Instead, our position is that unlike narrow

dimensional traits such as dependency, narcissism, and perfectionism (e.g., Hewitt et al., 2020;

Ogrodniczuk), broad dimensional personality traits may not influence specific group treatment

outcomes to the same extent (Asendorpf, 2016; Mõttus, 2016; Mõttus et al., 2017). Furthermore,

we speculate that relative to other self-report measures of personality, such as the

Multidimensional Perfectionism Scale (Hewitt & Flett, 1991), interview-based assessments, such

as the Shedler-Westen Assessment Procedure (SWAP; Shedler & Westen, 2007), and

pathological Big Five measures, non-pathological Big Five measures might be less effective in

capturing the details most relevant to the processes involved in group therapy with individuals

with diagnosed mental health disorders.

Limitations and Future Directions

Reductions in psychological symptoms, such as depression and anxiety, are not

synonymous with psychological growth or a lower likelihood of experiencing future

psychological distress. As such, our use of depression and anxiety symptoms as treatment

outcomes limited our ability to detect psychotherapeutic change (Shedler & Westen, 2004).

Additionally, our findings derive from a sample of highly distressed patients. Hence, the extent

to which our results generalize to less distressed patients is unclear. As well, though the

measures used in our study have consistently displayed adequate internal consistency, we were

unable to calculate Cronbach's alpha because our archival data set does not contain item-level

data. We also lacked the power needed to detect small-to-moderate effects and as such cannot

rule out that the Big Five traits might have a small-to-moderate impact on treatment outcomes,

which future research might be able to rectify meta-analytically. Lastly, an exciting and

intriguing area of future research that would advance the treatment outcome literature

substantially is whether measures intended to assess disordered personality structure, such as the

PID-5 and the SWAP, outperform measures designed to assess non-disordered personality, such

as the NEO-PI-R.

Concluding Remarks

The present study represents the largest, most rigorous test of the impact of Big Five

traits on group psychotherapy outcomes to date. Findings indicated that the five traits included in

the Big Five trait did not uniquely predict significant reductions in depression or anxiety

symptoms at post-treatment or 6-months follow-up. Given the methodological shortcomings of

prior research coupled with our null findings, the relevance of Big Five traits to the group

psychotherapy outcome remains to be demonstrated empirically.

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Table 1

Bivariate Correlations, Means, Standard Deviations, and Intraclass Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Neuroticism (pre-treatment)	—														
2. Extraversion (pre-treatment)	−.29**	—													
3. Openness (pre-treatment)	.10	.27**	—												
4. Agreeableness (pre-treatment)	−.36**	−.01	.16	—											
5. Conscientiousness (pre-treatment)	−.47***	.21	−.15	.21*	—										
6. Depression (pre-treatment)	.47***	−.03	.05	−.13	−.13	—									
7. Depression (post-treatment)	.40***	−.06	−.08	−.22*	−.06	.66***	—								
8. Depression (follow-up)	.35**	−.02	−.08	−.12	−.09	.59***	.66***	—							
9. Anxiety (pre-treatment)	.46***	.08	.00	−.16	.02	.63***	.57***	.46***	—						
10. Anxiety (post-treatment)	.37***	.04	−.08	−.26**	−.05	.49***	.76***	.66***	.73***	—					
11. Anxiety (follow-up)	.39***	.06	−.02	−.17	−.14	.55***	.56***	.84***	.65***	.75***	—				
12. Age	−.30**	−.05	−.29**	.08	.24**	−.23*	−.08	−.22	−.13	−.05	−.19	—			
13. Gender	.02	.08	.12	.19	.06	.03	.03	.03	.10	.08	.12	−.11	—		
14. Change in Depression	.08	.04	.16	.11	−.08	.41***	−.42***	.11	.06	−.33***	.13	−.18	−.01	—	
15. Change in Anxiety	.14	.07	.11	.11	.10	.24**	−.18	.11	.45***	−.28**	.10	−.12	.04	.51***	—
Mean	121.6	88.8	115.7	123.8	103.0	25.6	17.7	15.3	19.5	14.6	13.5	41.9	1.6	7.7	4.9
Standard deviation	24.4	22.4	20.7	18.1	22.1	12.7	12.7	13.5	13.4	12.5	13.5	11.5	0.47	10.5	9.6
Minimum	59	36	65	74	38	2	0	0	0	0	0	19	1	-24.0	-18.0
Maximum	182	136	160	172	155	61	56	61	63	63	61	75	2	30.0	34.0
Intraclass correlation	.04	.00	.05	.00	.00	.02	.06	.00	.01	.01	.00	.01	.00	—	—

Note. N = 77 to 128 (pairwise deletion). Intraclass correlation coeffects obtained using intercept-only models. Openness = openness to experience. Depression = depression symptoms; Anxiety = anxiety symptoms. Change in depression = depression (pre-treatment) minus depression (post-treatment); Change in anxiety = anxiety (pre-treatment) minus anxiety (post-treatment).

*p < .05; **p < .01; ***p < .001.

Table 2

Models with Post-Treatment Depression Symptoms as the Outcome

Parameters	Intercept-Only		Level 1: Fixed		Level 1: Random	
	B (SE)	95% CI	B (SE)	95% CI	B (SE)	95% CI
Regression coefficients						
Intercept (γ_{00})	17.56 (1.34)	14.94, 20.19	17.77 (0.92)	15.39, 19.58	17.72 (1.32)	15.13, 20.30
Baseline depression (γ_{10})	—		0.60 (0.08)	0.40, 0.75	0.60 (0.10)	0.41, 0.79
Neuroticism (γ_{20})	—		0.07 (0.05)	–0.03, 0.17	0.08 (0.09)	–0.10, 0.27
Extraversion (γ_{30})	—		0.01 (0.04)	–0.08, 0.09	0.01 (0.14)	–0.26, 0.28
Openness (γ_{40})	—		–0.07 (0.05)	–0.17, 0.03	–0.08 (0.07)	–0.21, 0.06
Agreeableness (γ_{50})	—		–0.07 (0.05)	–0.17, 0.03	–0.07 (0.06)	–0.18, 0.04
Conscientiousness (γ_{06})	—		0.05 (0.05)	–0.04, 0.14	0.05 (0.06)	–0.07, 0.17
Variance components						
Residual (e_{ij})	155.49 (21.32)	113.71, 197.27	84.23 (12.22)	60.28, 108.17	78.68 (12.84)	43.58, 103.77
Intercept (μ_{0j})	10.47 (12.62)	–14.27, 35.20	1.39 (5.99)	–10.35, 13.12	0.82 (12.84)	–24.28, 26.07
Neuroticism (μ_{2j})	—		—		0.01 (0.01)	–0.01, 0.03
Extraversion (μ_{3j})	—		—		0.00 (0.06)	–0.11, 0.11
Openness (μ_{4j})	—		—		0.00 (0.02)	–0.04, 0.05
Agreeableness (μ_{5j})	—		—		0.00 (0.14)	–0.28, 0.28
Conscientiousness (μ_{6j})	—		—		0.00 (0.04)	–0.07, 0.08
Model summary						
Number of clusters	22		22		22	
Average cluster size	5.8		5.4		5.4	
Number of free parameters	3		9		14	
AIC	1022.24		885.15		894.00	

Note. Standard errors listed in parentheses. AIC = Akaike Information Criterion. Predictors were grand mean centered. All estimates are unstandardized.

Table 3

Models with Follow-up Depression Symptoms as the Outcome

Parameters	Intercept-Only		Level 1: Fixed		Level 1: Random	
	B (SE)	95% CI	B (SE)	95% CI	B (SE)	95% CI
Regression coefficients						
Intercept (γ_{00})	15.26 (1.50)	12.34, 18.20	15.28 (1.26)	12.81, 17.74	15.28 (1.27)	12.78, 17.77
Baseline depression (γ_{10})	—		0.59 (0.12)	0.36, 0.83	0.59 (0.10)	0.39, 0.79
Neuroticism (γ_{20})	—		0.10 (0.07)	–0.06, 0.25	0.10 (0.09)	–0.08, 0.27
Extraversion (γ_{30})	—		0.05 (0.07)	–0.08, 0.09	0.05 (0.07)	–0.09, 0.19
Openness (γ_{40})	—		–0.12 (0.07)	–0.26, 0.01	–0.12 (0.07)	–0.26, 0.01
Agreeableness (γ_{50})	—		0.06 (0.08)	–0.10, 0.22	0.06 (0.10)	–0.13, 0.24
Conscientiousness (γ_{06})	—		0.03 (0.08)	–0.13, 0.18	0.03 (0.10)	–0.17, 0.23
Variance components						
Residual (e_{ij})	175.22 (29.27)	117.85, 232.59	113.71 (19.94)	74.63, 152.78	112.21 (22.42)	68.28, 156.15
Intercept (μ_{0j})	1.15 (17.93)	–33.99, 36.29	1.02 (10.91)	–20.36, 22.40	0.45 (14.08)	–27.15, 28.05
Neuroticism (μ_{2j})	—		—		0.01 (0.01)	–0.02, 0.03
Extraversion (μ_{3j})	—		—		0.00 (0.02)	–0.03, 0.03
Openness (μ_{4j})	—		—		0.00 (0.04)	–0.07, 0.08
Agreeableness (μ_{5j})	—		—		0.00 (0.04)	–0.08, 0.08
Conscientiousness (μ_{6j})	—		—		0.00 (0.03)	–0.05, 0.06
Model summary						
Number of clusters	20		19		19	
Average cluster size	4.1		3.9		3.9	
Number of free parameters	3		9		14	
AIC	654.73		586.42		596.54	

Note. Standard errors listed in parentheses. AIC = Akaike Information Criterion. Predictors were grand mean centered. All estimates are unstandardized.

Table 4

Models with Post-Treatment Anxiety Symptoms as the Outcome

Parameters	Intercept-Only		Level 1: Fixed		Level 1: Random	
	B (SE)	95% CI	B (SE)	95% CI	B (SE)	95% CI
Regression coefficients						
Intercept (γ_{00})	14.77 (1.09)	12.62, 16.91	14.56 (0.74)	13.12, 16.00	14.54 (1.87)	10.88, 18.20
Baseline anxiety (γ_{10})	—		0.66 (0.07)	0.53, 0.79	0.66 (0.16)	0.34, 0.98
Neuroticism (γ_{20})	—		0.00 (0.05)	–0.09, 0.08	0.00 (0.06)	–0.12, 0.13
Extraversion (γ_{30})	—		0.00 (0.04)	–0.07, 0.08	0.01 (0.04)	–0.07, 0.09
Openness (γ_{40})	—		–0.04 (0.04)	–0.12, 0.03	–0.05 (0.04)	–0.13, 0.04
Agreeableness (γ_{50})	—		–0.08 (0.05)	–0.17, 0.01	–0.08 (0.06)	–0.20, 0.04
Conscientiousness (γ_{06})	—		–0.03 (0.04)	–0.11, 0.05	–0.03 (0.07)	–0.16, 0.11
Variance components						
Residual (e_{ij})	157.88 (20.99)	116.73, 199.03	67.94 (9.22)	49.86, 86.01	63.16 (6.63)	50.16, 76.16
Intercept (μ_{0j})	0.18 (8.91)	–17.28, 17.63	0.13 (3.63)	–6.99, 7.25	0.75 (2.58)	–4.31, 5.80
Neuroticism (μ_{2j})	—		—		0.00 (0.02)	–0.03, 0.04
Extraversion (μ_{3j})	—		—		0.00 (0.02)	–0.04, 0.04
Openness (μ_{4j})	—		—		0.00 (0.03)	–0.06, 0.06
Agreeableness (μ_{5j})	—		—		0.01 (0.04)	–0.08, 0.09
Conscientiousness (μ_{6j})	—		—		0.00 (0.07)	–0.13, 0.13
Model summary						
Number of clusters	23		23		23	
Average cluster size	5.8		5.6		5.6	
Number of free parameters	3		9		14	
AIC	1064.70		921.47		931.01	

Note. Standard errors listed in parentheses. AIC = Akaike Information Criterion; Predictors were grand mean centered. All estimates are unstandardized.

Table 5

Models with Follow-Up Anxiety Symptoms as the Outcome

Parameters	Intercept-Only		Level 1: Fixed		Level 1: Random	
	B (SE)	95% CI	B (SE)	95% CI	B (SE)	95% CI
Regression coefficients						
Intercept (γ_{00})	13.46 (1.44)	10.64, 16.28	13.36 (1.11)	11.19, 15.52	13.19 (1.08)	11.08, 15.30
Baseline anxiety (γ_{10})	—		0.61 (0.10)	0.41, 0.81	0.66 (0.10)	0.47, 0.86
Neuroticism (γ_{20})	—		0.07 (0.07)	–0.07, 0.21	0.04 (0.07)	–0.11, 0.18
Extraversion (γ_{30})	—		0.09 (0.06)	–0.03, 0.21	0.06 (0.06)	–0.05, 0.17
Openness (γ_{40})	—		–0.09 (0.06)	–0.20, 0.03	–0.07 (0.07)	–0.22, 0.07
Agreeableness (γ_{50})	—		–0.02 (0.07)	–0.12, 0.15	0.01 (0.07)	–0.13, 0.15
Conscientiousness (γ_{06})	—		–0.06 (0.04)	–0.19, 0.07	–0.07 (0.06)	–0.19, 0.05
Variance components						
Residual (e_{ij})	172.92 (28.16)	117.73, 228.12	96.15 (16.64)	63.54, 128.75	74.68 (14.47)	46.33, 103.03
Intercept (μ_{0j})	1.13 (18.81)	–35.74, 38.00	1.09 (10.18)	–18.86, 21.03	0.25 (12.84)	–24.92, 25.41
Neuroticism (μ_{2j})	—		—		0.01 (0.02)	–0.02, 0.04
Extraversion (μ_{3j})	—		—		0.00 (0.02)	–0.04, 0.04
Openness (μ_{4j})	—		—		0.04 (0.03)	–0.01, 0.08
Agreeableness (μ_{5j})	—		—		0.00 (0.03)	–0.06, 0.06
Conscientiousness (μ_{6j})	—		—		0.00 (0.02)	–0.03, 0.03
Model summary						
Number of clusters	22		21		21	
Average cluster size	4.0		3.9		3.9	
Number of free parameters	3		9		14	
AIC	701.63		633.32		639.28	

Note. Standard errors listed in parentheses. AIC = Akaike Information Criterion; Predictors were grand mean centered. All estimates are unstandardized.