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Can Myers-Briggs Dimensions Predict Therapy Outcome? Differences in the Thinking-Feeling Function Pair in Cognitive Therapy for Depression/Anxiety

Jeremy Jinkerson[1]✉, Audrey Masilla[1] & Raymond C. Hawkins II[2]

Abstract. The Myers-Briggs Type Indicator (MBTI) is sometimes used to predict therapy outcome and select the therapeutic modality, but the empirical basis for these uses is minimal. In the current study, psychological type (assessed by the MBTI) and initial functioning (assessed by Global Assessment of Functioning [GAF]) were used to predict the therapy outcome, as measured by the change in GAF within a sample of outpatient clients (N = 525) receiving cognitive therapy. Hierarchical regression and logistic regression were used to identify whether the 16 MBTI psychological types and/or which dichotomous attitude and function pairs best predicted the psychotherapy outcome. The Thinking-Feeling function was found to be a significant predictor of the cognitive therapy outcome, such that individuals who preferred Thinking demonstrated greater improvement in GAF than individuals who preferred Feeling. However, when initial GAF was included in the regression, Thinking-Feeling was no longer a significant outcome predictor. Four-letter personality type was not a significant predictor of the psychotherapy outcome. Overall, the results indicated that individuals who preferred the Thinking function showed greater benefit from cognitive therapy than individuals who preferred Feeling, and they underscored the importance of a thorough initial assessment of adaptive functioning.
Keywords: Personality, Psychotherapy, Outcome

The Myers-Briggs Type Indicator (MBTI) is one of the most widely used measures of normal personality. It uses forced choice questions to identify respondents' preferences on four attitude and function pairs based upon Jungian psychology (i.e., Extraversion-Introversion, Sensing-Intuition, Thinking-Feeling, and Judging-Perceiving). These four individual preferences are combined to form respondents' four-letter personality types. The MBTI personality types are called *psychological types,* which indicate that individuals with similar types have similar approaches toward interacting with others and the world (Jung, 1921/1971; Myers, McCaulley, Quenk, & Hammer, 1998). In the MBTI model, all people possess psychological types, and there are no types besides the 16 identified combinations (see Appendix A). Likewise, each psychological type is associated with a profile explanation, such that if one's psychological type is known, it is theoretically possible to predict how he or she will respond across situations (Myers et al., 1998). For example, people with Introversion-Sensing-Thinking-Judging (ISTJ) preferences are described as logical, practical, problem solvers, dedicated to organizations and traditional rules, and very responsible in their decision making (Myers et al., 1998).

Jungian-oriented clinicians sometimes use the MBTI to predict the therapy course and to select the therapeutic modality based upon psychological type (Janowsky, 1999; Myers et al., 1998; Myers,

[1] Fielding Graduate University
[2] Fielding Graduate University and University of Texas at Austin
✉ Correspondence concerning this article should be addressed to Jeremy Jinkerson, Fielding Graduate University. E-mail: jjinkerson@email.fielding.edu

McCaulley, Quenk, & Hammer, 2009; Ogrodniczuk, Piper, Joyce, McCallum, & Rosie, 2003; Provost, 1993). However, research validating the MBTI for this purpose is limited, unreplicated, unpublished, or non-empirical (Fairbanks, 1987; Giroux, 1979; Graff, 1976; Janowsky, 1999; Vilas, 1988). To ensure effective clinical services, research evaluating therapy outcomes for different personality/psychological types are essential. The present study addressed this discrepancy between practice and evidence by evaluating the MBTI's utility in predicting the cognitive therapy outcome.

Psychotherapy Outcome Predictors

Several important predictors of the psychotherapy outcome have already been identified. These include patient characteristics (e.g., psychiatric diagnosis, comorbid diagnoses, the presence of personality disorder, neuroticism, and stage of change), therapist characteristics (e.g., warmth and empathy), and interaction effects (i.e., therapeutic alliance and matching treatment to stage of change readiness) (Eubanks, Carter, Burckell, & Goldfried, 2005; McKay, Abramowitz, & Taylor, 2010; Norcross, 2011). The remaining unexplained variance is most likely accounted for by these same domains of patient traits, therapist characteristics, and interaction effects. The possible predictive patient characteristics include personality type/factors and degree of distress. Therapist characteristics likely include personality type/factors and the ability to match treatment to multiple stages of change. The probable interaction effects include the therapist matching clinical style to patient need, and matching therapists to clients by personality or worldview (Eubanks-Carter, Burckell, & Goldfried, 2005; Norcross, 2011; Norcross & Wampold, 2011). Despite the strong calls to action to empirically verify some of these presumptive psychotherapy outcome predictors, few predictors have been identified (Norcross, 2011, 2012; Norcross & Wampold, 2011).

Nevertheless, researchers and practitioners have continued to argue that personality should be used as a basis for treatment-planning and with minimal empirical basis for doing so (Beutler, Harwood, Michelson, Song, & Holman. 2011; Harkness & Lilienfeld, 1997; MacKenzie, 1994; Myers, McCaulley, Quenk, & Hammer, 1998, 2009; Miller, 1991; Provost, 1993). This insistence on personality's predictive value is likely due to practitioners' personal clinical experiences. Additionally, the existing attempts to test the hypothesis that personality predicts/moderates therapy outcome have had insufficient power due to attempts to include additional diagnostic and treatment variables (Beutler, 1991). As such, although these attempts have not supported the predictive value of personality, the hypothesis has not been rejected outright (Beutler, 1991; Capsi & Bell, 2004; Smith & Sechrest, 1991). The present study evaluated the relative merits of the MBTI in predicting the cognitive therapy outcome. Despite using some minor diagnostic exclusionary criteria, the current study did not focus on one diagnostic subcategory, which ensured sufficient power to identify the small effects of psychological type.

Using Personality Measures to Predict Therapy Outcome

Several studies have found that individuals respond differently to certain therapies according to the MBTI attitude and function pairs. First, Graff (1976) found that systematic desensitization was more effective for males who preferred Thinking and females who preferred Feeling, as measured by the MBTI. Fairbanks (1987) then found that relaxation therapy with imagery rehearsal produced superior outcomes for individuals who preferred Intuition, whereas relaxation therapy with cognitive restructuring produced superior outcomes for individuals who preferred Sensing. Giroux (1979) found that individuals who preferred Feeling had better outcomes (measured by decreases in irrational thinking) in rational-emotive group therapy than individuals who preferred Thinking, although his counter-intuitive results likely reflected the use of a non-clinical population, small sample, and non-standardized assessment of irrational thinking.

In a unique study, Vilas (1988) evaluated whether the psychological types of clients (N = 241) and their counselors could predict the counselor's perception of outcome and counselor-rated client motivation. He found that counselors rated clients who preferred Judging as more motivated for treatment than those who preferred Perceiving. Male clients who preferred Sensing were also rated as more motivated and better functioning than clients who preferred Intuition. Vilas' (1988) study has not been replicated, and there have been no studies using quantifiable measures to predict the psychotherapy outcome based on the MBTI Type or attitude and function pairs.

In addition to these studies that demonstrate differential response by personality features, Carskadon (1977, 1979) also found that personality features can predict therapy preferences. Specifically, individuals who preferred Feeling preferred humanistic therapies, whereas individuals who preferred Thinking preferred cognitive-behavioral therapies. Likewise, individuals who preferred Thinking disliked Rogerian therapy styles, whereas individuals who preferred Feeling preferred such styles (Carskaon, 1997, 1979). Similarly, Arain (1968) found that individuals who preferred Thinking preferred cognitive therapy, and individuals

who preferred Feeling preferred emotionally expressive counseling. Such preferences for particular counseling styles may actually impact therapeutic response, although there is no existing evidence to support such a case. Therefore, it is essential to evaluate the effectiveness of cognitive therapy across psychological types and preferences.

Differential therapy responses have also been identified for the related Revised Neuroticism-Extraversion-Openness Personality Inventory (NEO-PI-R). Because the NEO-PI-R five factors are correlated with the MBTI's four attitude and function pairs, the NEO-PI-R ability to predict the therapy outcome may suggest that the MBTI possesses a similar utility. Regarding the NEO-PI-R's predictive value, Miller (1991) found Extraversion and Conscientiousness to be positively correlated with an unnamed psychotherapy outcome measure, whereas Neuroticism was negatively correlated with outcome. Ogrodniczuk and colleagues (2003) similarly found that Extraversion positively predicted symptom reduction and life satisfaction, and Neuroticism was again negatively correlated with symptom remission. Openness positively predicted improved life satisfaction, and Conscientiousness positively predicted symptom reduction (Ogrodniczuk et al., 2003). Bagby and colleagues (2003) likewise found that Openness was associated with decreased depression in people with Major Depressive Disorder, whereas Neuroticism was negatively correlated with outcome.

The present study extends previous research by: (1) Replicating early attempts to use the MBTI Type and dimensional scales to predict therapy outcome; (2) using a quantifiable outcome measure with greater variability than historical studies; and (3) evaluating variable response to cognitive therapy, which is an orthodox therapy in wide practice (Beck, 2011).

Hypotheses

Because individuals who prefer Extraversion are more oriented toward the outer world and interpersonal communication (Myers et al., 1998), and because the NEO-PI-R Extraversion factor has positively predicted psychotherapy outcomes (Miller, 1991; Ogrodniczuk et al., 2003), we predicted that clients who prefer Extraversion would have more superior outcomes in cognitive therapy than clients who prefer Introversion.

As individuals who prefer Intuition are willing to consider new experiences, and as therapists are frequently Intuitive types (McCaulley, 2000; Provost, 1993), we predicted that individuals who prefer Intuition would have better outcomes in cognitive therapy than those who prefer Sensing.

Given that individuals who prefer Thinking are more given to logical decision making (Myers, McCaulley, Quenk, & Hammer, 2009), we predicted that individuals who prefer Thinking would have better outcomes in cognitive therapy than those who prefer Sensing.

Because individuals who prefer Judging are more prone to stress (Myers et al., 1998), and because higher NEO-PI-R Openness was associated with depression alleviation (Bagby et al., 2003), we predicted that clients who prefer Perceiving would have better outcomes than clients who prefer Judging.

Method

Participants

Participants were selected from a private psychological practice in Texas using a high-inclusion convenience sampling model. Potential participants were selected into the sample by: 1) Self-referring into psychological treatment *or* by accepting a referral to psychological treatment; and 2) agreeing that their de-identified data could be used for clinical research purposes through a verbal and written informed consent process. Potential participants were excluded from the study if they reported immediate suicidal/homicidal intent or psychosis; these individuals were referred for in-patient treatment. Individuals with primary personality disorder diagnoses were also excluded.

From the sample of 525 participants, the gender distribution was 49.0% male and 51.0% female. Specific race information was not available, although the majority of participants were Caucasian. Seventy-two percent of participants were married, 18.6% were single, and 9.9% were divorced. The mean patient age was 39, SD = 10.5 years. The majority of participants (66.1%) were between the ages of 25 and 45. Twenty-seven percent were age 46 or older. Four percent of participants were aged 18 to 24, and 3% were aged 10 to 17. The mean initial GAF score was 62.82, SD = 7.05; the mean end GAF was 69.33, SD = 7.17. Seventy-seven percent of participants had initial GAF scores below 70,

Table 1. Four-letter MBTI distribution (N=525).

Type	Frequency	Type	Frequency	Type	Frequency	Type	Frequency
ISTJ	57 (10.86%)	ISFJ	55 (10.48%)	INFJ	16 (3.08%)	INTJ	41 (7.81%)
ISTP	19 (3.6%)	ISFP	15 (2.86%)	INFP	51 (9.71%)	INTP	46 (8.76%)
ESTP	7 (1.33%)	ESFP	19 (3.62%)	ENFP	64 (12.19%)	ENTP	24 (4.57%)
ESTJ	38 (7.24%)	ESFJ	32 (6.1%)	ENFJ	27 (5.14%)	ENTJ	14 (2.67%)

whereas 23% of participants had initial GAF scores of 70 or higher. Post-treatment, 36.7% of participants had final GAF scores below 70, whereas 63.3% of participants had final GAF scores of 70 or higher. At the end of treatment, 42.6% of participants' GAF scores had improved by 10 points or more. Each MBTI personality type was well represented (see Table 1). Diagnoses were applied by a licensed clinical psychologist who was board certified by the American Board of Professional Psychology. Diagnoses were per the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition—Revision* (DSM; American Psychiatric Association [APA], 1994). The prominent primary diagnoses in this sample were Major Depressive Disorder, accounting for 23.6% of the sample; Depressive Disorder Not Otherwise Specified (NOS), which accounted for 11% of the sample; Dysthymic Disorder, accounting for 8.1% of the sample; and Adjustment Disorder, which accounted for 7.8% of the sample. The semi-prominent diagnoses were Anxiety Disorder NOS and Eating Disorder NOS, each of which accounted for 3.9% of the sample. The percentages of individuals meeting the diagnostic criteria at the end of treatment were not available. This somewhat heterogeneous sample was used to accurately reflect the idiographic reality of private clinical practice, secure the maximum ecological validity for outpatient treatment, and obtain the sufficient power to identify small effects.

Procedure

During data collection, clients were administered the Myers-Briggs Type Indicator (MBTI) Form F. Before treatment began, clients were evaluated by a baseline Global Assessment of Functioning (GAF) rating given by a licensed, board certified clinical psychologist (who is the paper's third author). Three therapy sessions were provided following the initial intake and assessment procedure. After treatment concluded, a follow-up GAF rating was recorded by the same psychologist. Analyses were conducted by the paper's first author.

Beck's (1979) Cognitive therapy for depression and anxiety was provided in keeping with Beck's (1979) original manual for depression treatment and Judith Beck's (1995) manual update for the treatment of depression and anxiety.

As presented in Beck (1979) and Beck (1995), therapy began by helping clients recognize the relationships of thoughts, feelings and behaviors and then identify the problematic automatic thoughts. Problematic thoughts were identified through a guided discovery process emphasizing Socratic dialogue (Beck, 1979; Beck, 1995; Nezu & Nezu, 1989; Nezu, Nezu, & Lombardo; 2004; Wright, Basco, & Thase, 2006). Likely problematic thoughts were also identified by using a case formulization approach to the initial assessment, in which presenting problems were considered in terms of the precipitants, maintaining factors, and cognitive model of psychopathology (Beck, 1995; Persons, Jacqueline, & Tompkins, 1997; Persons, 2012). Automatic thoughts were evaluated for rationality and helpfulness, and patients learned how to respond to depressive and anxious thoughts with positive self-talk and cognitive restructuring. A homework assignment to recognize the negative feeling states, identifying automatic thoughts, responding to automatic thoughts, and tracking mood states was given between sessions (Beck, 1979; Beck, 1995). Rational problem-solving skills were taught to address life stressors (Beck, 1995; Nezu & Nezu, 1989; Nezu, Nezu, & Lombardo; 2004). Given the brevity of treatment, core beliefs were not addressed in most cases.

Regarding the quality of treatment, therapy was provided by a licensed clinical psychologist who has over 30 years of experience in cognitive-behavioral therapy (CBT), is board certified in clinical psychology by the American Board of Professional Psychology, and has trained over 130 advanced graduate students and fellows in CBT, strength-based therapy, and integrative therapies.

Power Analysis

When using personality factors to predict the psychotherapy outcome, previous studies (Bagby et al., 2008; Miller, 1991; Ogrodniczuk et al., 2003) generally found small effect sizes (range of r from 0.07 to 0.14) (Cohen, 1988). Power analysis was conducted using G*Power v.3.1.5 using an R^2 deviation from a zero linear multiple regression design. The power analysis indicated that, given power = 0.80, a sample size of 189 should be sufficient to identify a small effect size of $R^2 = 0.07$, where 0.07 is the smallest effect size identified by examining the existent literature. A secondary power analysis for the planned hierarchical regression was conducted which indicated that a sample size of 181 would identify a small effect size of $R^2 = 0.07$, given a power of 0.80.

Instruments

Myers-Briggs Type Indicator (MBTI). The MBTI is an assessment tool used to identify psychological type, as described by Carl Jung (1921/1971). According to Jung, individual differences in behavior can primarily be explained by an orderly system of personality distribution called psychological type. This typological theory is based on three polar attitude and function pairs, which Jung believed were biologically determined. For each attitude and function pair, Jung theorized that individuals exhibited *preferences* of using one attitude/function over the other in most situations. He believed that people relate to society through the Extraversion and Introversion attitudes. Individuals who prefer Extra-

version tend to act upon the environment, value external interaction, and become energized by socially relating, whereas individuals who prefer Introversion tend to focus on concepts/ideas, rely on theory more than external events, and become energized by spending time in personal thought (Jung, 1921/1971; Myers, McCaulley, Quenk, & Hammer, 1998). Jung hypothesized that people engage with the perceptual and phenomenological worlds through the Sensing and Intuition Functions. Theoretically, individuals who prefer Sensing tend to be empirically oriented, detail-oriented, and practical, whereas individuals who prefer Intuition tend to develop holistic theories, consider *gestalts* over details, and be future-oriented. Finally, Jung hypothesized two polar rational functions. Individuals who prefer Thinking tend to make logical connections, think critically, arrive at objective conclusions, and emphasize justice/fairness, whereas individuals who prefer Feeling tend to temper critical thinking with respect for the values of individuals and groups. Individuals who prefer Feeling still think rationally and critically, but they emphasize value respect over strict adherence to logical conclusions. According to Jung's type theory, individuals use both of the attitudes and all of the four functions. However, they naturally prefer to use one attitude/function over its opposite (Jung, 1921/1971, Myers, McCaulley, Quenk, & Hammer, 1998).

Myers and McCaulley (1985) developed the MBTI to accurately identify individuals' Jungian psychological type. The MBTI Form F is a 166-item self-report instrument in which respondents answer forced-choice questions about how they would respond in various situations. Based upon the responses, test scores indicate which attitude and function pairs the respondent prefers. In addition to the attitude and function pairs explicitly named by Jung (1921/1971), Myers and McCaulley (1985) argued that an additional outer world orientation was implicit in Jung's (1921/1971) work. Regarding the outer world function, individuals who prefer Judging tend to plan ahead, organize, and emphasize rational function use, whereas individuals who prefer Perceiving tend to be spontaneous, curious, and emphasize the perceptual function. These attitude and function pairs form the MBTI's subscales, which identify the attitude/function preferences. Based upon each preference, respondents are also assigned four-dimension psychological types. There are a total of 16 psychological types (Myers, McCaulley, Quenk, & Hammer, 1998).

The MBTI has shown itself to be a reliable instrument, although individually reported reliability statistics vary. This archival research used the MBTI Form F, which was considered the "research standard form" until 2012 (Center for the Applications of Psychological Type, n.d.). Split-half reliability coefficients for the four continuous scales range from $r = .80$ to .97 (Myers & McCaulley, 1985). Coefficient alpha internal consistency reliability ranges from $r = .83$ to .87 (Harvey, Murry, & Markham, 1994). In test-retest studies, the individual letter agreement is consistent 66 to 90% of the time (Myers & McCaulley, 1985), with complete four-letter agreement being less than 50% (Harvey, 1996; Myers & Briggs Foundation, n.d.). Exploratory factor analyses have identified surprisingly good fit with the predicted four-factor model of the Myers-Briggs typology (Harvey, Murry, & Stamoulis, 1995). Confirmatory factor analyses have also supported the model (Harvey, 1996). Additionally, the MBTI exhibits predictive validity in assessing job preferences (Harvey, 1996; McCaulley, 2000).

Global Assessment of Functioning (GAF). The GAF scale is a clinician-rated instrument that measures functioning in multiple life settings, such as the degree of psychological health/pathology, ability to cope with psychological stressors, and degree of impairment in social, occupational, or school functioning. Clinicians rate GAF on a scale from 1 to 100, where each 10-point range represents a qualitatively different degree of functioning. Each 10-point range represents the degree of symptomatology *and* degree of functional impairment. Clinicians apply GAF scores based on whichever domain (i.e., symptomatology or functionality) is most severe. For instance, the range from 51–60 is associated with moderate symptoms (e.g., flat affect. circumlocutory speech, and occasional panic attacks) *or* moderate difficulty in social, occupational, or school functioning (e.g., few friends and conflicts with peers or coworkers) (APA, 1994). Individuals in outpatient therapy most often receive scores ranging from 55 (e.g., serious symptoms or serious impairment) to 80 (transient symptoms or slight impairment) (APA, 1994; Hanssen-Bauer, Aalen, Rudd, & Heyerdal, 2007; Woldoff, 2004).

The third and fourth editions of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) included GAF as an essential portion of psychiatric diagnosis (APA, 1978, 1994). The changes in GAF scores provide a means of measuring the subjective degree to which individuals are improving or regressing. Some studies have found good to fair inter-rater reliability for GAF when used by trained professionals/researchers and applied to mildly to moderately impaired individuals (Hanssen-Bauer et al., 2007; Woldoff, 2004). Others have found poor inter-rater reliability across professions and in routine clinical practice (Grootenboer, et al., 2010; Vatnaland, Vatnaland, Friss, & Opjordsmoen, 2007). Because the outpatient participants within the current study were expected to show mild to moderate levels of impairment, changes in the GAF score were used as a means of measuring the psychotherapy outcome. GAF was not included in the

most recent fifth edition of the DSM (DSM-5) due to concerns about its reliability when administered by multiple clinicians, insufficiently trained clinicians, and in routine practice (APA, 2013). However, in the present study, GAF was assigned by a licensed, board certified clinical psychologist. Furthermore, GAF scores were a preferred means of measuring the psychotherapy outcome prior to the advent of standardized objective outcome measures, and they are especially useful in archival research that predates the standard implementation of self-report outcome measures (Lambert et al., 2004).

Results

A series of correlational analyses were conducted with this sample of psychotherapy clients (N=525) to identify if psychological type and attitude and function dichotomies (I vs. E, S vs. N, T vs. F, and J vs. P), as measured by the MBTI, could effectively predict the cognitive therapy outcome, as measured by the degree of change from the initial GAF score and final GAF score. First, a stepwise regression including each dichotomous scale was conducted. A review of histograms and scatterplots suggested a linear, somewhat leptokurtic distribution with ratings clustered around central raw GAF scores divisible by five (e.g., 50, 55, 60, and 65). Given the tendency of central clustering, floor and ceiling effects are not believed to have influenced results. Four multivariate outliers were deleted from statistical analyses, as their Mahalanobis distances were significantly removed from the Mahalanobis boxplot. Collinearity statistics were within acceptable ranges (Tolerance > 0.1, VIF < 10.0), so the assumption of multicollinearity was presumed to have been met. The regression results indicated that the overall model did not significantly predict the psychotherapy outcome, $R^2 = .011$, $R^2_{adj} = .003$, $F(4, 511) = 1.431$, $p > .05$.

Table 2. Linear regressions predicting GAF change by dimensional scales

Scale	β	t (519)	P	M	SD
Extraversion-Introversion	.029	.672	.502		
Sensing-Intuition	.019	.442	.659		
Thinking-Feeling	-.088	2.001	.046		
Thinking				7.23	7.87
Feeling				5.95	6.75
Judging-Perceiving	-.030	.689	.491		

Because the stepwise model including all MBTI dimensions was not predictive of the therapy outcome, simple regressions were conducted to see if any individual dimensions held predictive value. Separate linear regressions were also conducted for males and females. To identify if the final GAF score was a superior criterion for outcome, regressions were also conducted using the final GAF score instead of change in the GAF score.

The results indicated that Thinking-Feeling was the only function pair that was a significant predictor of the psychotherapy outcome, $\beta = -.088$, t(519) = -2.001, $p < .05$, as measured by changes in the Global Assessment of Functioning scale. Specifically, individuals who preferred Thinking exhibited more improvement in GAF change, M=7.23, SD=7.87, although the standard deviation was larger than that of individuals who preferred Feeling, M=5.95, SD=6.75. The effect size for the model containing Thinking-Feeling was $f^2 = 0.087$, indicating that Thinking-Feeling accounted for 8.7% of the variance in GAF change. This finding supported our hypothesis (Table 2).

To identify the relative contribution of the initial functioning on the outcome, a secondary two-step hierarchical regression was conducted with Thinking-Feeling entered in the first step, initial GAF entered in the second step, and GAF change used as the outcome variable. Collinearity statistics were again in acceptable ranges. The model significantly predicted $R^2 = .505$, $R^2_{adj} = .255$, $F(1, 518) = 172.057$, $p < 001$. Initial functioning, as measured by initial GAF, was a significant predictor of GAF change, $\beta = -.515$, t (518) = -13.12, $p < .001$, and when initial GAF was added to the model, Thinking-Feeling was no longer a significant predictor, $\beta = -.972$, t (518) = -1.75, $p > .05$. This finding indicates that initial functioning has a greater impact on the psychotherapy outcome than the Thinking-Feeling function. An additional correlation analysis was conducted using the four attitude/function pairs and change in GAF. Relationships between Extraversion-Introversion, Sensing-Intuition, and Judging-Perceiving were non-significant, $ps > .05$, whereas the correlation between Thinking-Feeling and change in GAF was significant, $r = -.088$, $p < .05$. When the same variables were compared in a partial correlation analysis, while controlling for initial GAF, Thinking-Feeling's correlation with change in GAF was no longer significant, $r = -0.77$, $p > .05$.

Table 3. Linear regressions predicting final GAF score by dimensional scales

Scale	β	t (519)	P
Extraversion-Introversion	-.011	-.246	.806
Sensing-Intuition	.034	.786	.432
Thinking-Feeling	-.047	-1.080	.281
Judging-Perceiving	-.017	-.395	.693

The Extraversion-Introversion attitude was not

a significant predictor of the psychotherapy outcome, β = .029, t (519) = .672, p > .05, nor were Sensing-Intuition, β = .019, t (519) = .442, p > .05, or Judging-Perceiving, β = -.443, t (519) = -.689, p > .05. When final GAF score, rather than GAF change from baseline to end of treatment, was used as a criterion, none of the attitude or function pairs were significant predictors of the psychotherapy outcome (See Table 3), which may indicate that change in GAF score is a preferable outcome measure to final GAF score. When linear regressions were conducted for males and females separately, no attitude or function pairs predicted outcome by GAF score (See Tables 4 and 5). A one-way factorial analysis of variance (ANOVA) was also conducted to identify if there were significant differences in psychotherapy outcome between the sixteen MBTI psychological types. No significant differences in change in GAF score were predicted by MBTI personality type, F (15, 505) = 1.353, p > .05.

Table 4. Linear regressions predicting GAF change by dimensional scales (males only)

Scale	β	t (519)	P
Extraversion-Introversion	.069	1.100	.272
Sensing-Intuition	-0.27	-.437	.662
Thinking-Feeling	-.081	-1.297	.196
Judging-Perceiving	-.040	-.632	.528

In an additional analysis, the sample was separated into participants with good outcomes and participants with poor outcomes, where a good outcome was defined as a GAF change of ten or more points; this variable was termed goodness of response. The sample was also separated into groups based upon their initial level of functioning, as measured by GAF, where participants were classified as having good initial functioning if their initial GAF rating was 70 or higher. Lower GAF ratings were categorized as less-than-good initial functioning. To identify the degree to which MBTI attitude and function pairs can predict goodness of response, while controlling for gender and initial functioning, logistic nominal regression was conducted using the four MBTI attitude and function pairs as predictor variables, goodness of response as an outcome variable, and both gender and initial functioning as covariates. Likelihood ratio test indicated that the model exhibited good fit, (χ^2 (6, N = 524) = 52.411, p < .001), and Cox and Snell R^2 = .096, indicating that the model predicted 9.6% of the overall variation in goodness of response. Thinking-Feeling significantly predicted goodness of response, β = .475, SE = .193, p < .05, where individuals who preferred Thinking were more likely to be classified as having good response. Initial functioning also predicted goodness of response, β = -1.592, SE = .263, p < .0001, where individuals with high initial functioning were more likely to be classified as having good response. Other MBTI attitude and function pairs did not predict goodness of response (Table 6).

Table 5. Linear regressions predicting GAF change by dimensional scales (females only)

Scale	β	t (519)	P
Extraversion-Introversion	.001	.008	.993
Sensing-Intuition	.062	1.013	.312
Thinking-Feeling	-.102	-1.670	.096
Judging-Perceiving	-.019	-.311	.756

Table 6. Logistic nominal regression: Using MBTI attitude/function pairs to predict goodness of response while controlling for initial functioning and gender

				95% CI for Odds Ratio		
Predictor	β (SE)	df	p	Lower Bound	B (Exp)	Upper Bound
EI*	-.075 (.193)	1	.7	.64	.93	1.35
SN	-.202 (.205)	1	.32	.55	.82	1.22
TF	.475 (.193)	1	.01	1.10	1.31	2.35
JP	.019 (.207)	1	.93	.68	1.02	1.53
Initial GAF = 70+	-1.592 (.263)	1	.0001	.12	.20	.34
Initial GAF <70	0	0	-	-	-	-
Gender=Male	.233 (.189)	1	.22	.87	1.3	1.83
Gender=Female	0	0	-	-	-	-

Note. R^2 = .074 (McFaden); .096 (Cox & Snell); .129 (Nagelkerke); Model (χ^2 (6, N = 524) = 52.411, p < .001

* See Appendix A for attitude and function pair abbreviations.

Discussion

As predicted, individuals who preferred Thinking had better outcomes in cognitive therapy than individuals who preferred Feeling. However, Extraversion-Introversion, Sensing-Intuition, and Judging-Perceiving did not predict the psychotherapy outcome. Results supported the contention that Thinking types have better therapy outcomes than Feeling types in cognitive therapy. Utilization of rational thinking in cognitive therapy via Socratic dialogue is an essential intervention of cognitive therapy, and it is predominantly value-neutral (Beck, 2011; Nezu & Nezu, 1989; Nezu, Nezu, & Lombardo; 2004; Wright, Basco, & Thase, 2006). Not only is this style more appealing to individuals who prefer Thinking (Carskadon, 1979), but individuals who prefer the rational Thinking function are better practiced in its use than individuals who preferred the Feeling function (Myers, McCaulley, Quenk, & Hammer, 1998, 2009). As such, individuals who prefer Thinking may exhibit an increased aptitude to cognitive therapy than individuals who prefer Feeling.

As the Thinking-Feeling function pair accounted for 8.7% of the variance in psychotherapy outcome, the MBTI may have some utility as a treatment planning screening tool to differentially provide cognitive therapy to individuals who prefer Thinking. However, it is important to note that initial functioning was a stronger predictor of outcome than was the Thinking-Feeling function; in fact, when initial functioning was included as a predictor, Thinking-Feeling's outcome contribution was no longer statistically significant. Moreover, nearly half of the participants exhibited clinically significant improvement regardless of psychological type or preference, indicating that individuals benefited from cognitive therapy whether they had Thinking or Feeling preferences. Given that cognitive therapy uses the Thinking function more than the Feeling function, how might this finding be explained? Individuals who prefer Thinking are better practiced at the use of Thinking and are more likely to have an existing aptitude for cognitive therapy. However, individuals who prefer Feeling also use the Thinking function, and the psychotherapeutic situation may provide an especially valuable opportunity to develop this function's use. That is, both individuals who prefer Thinking and Feeling benefit from the use of Thinking in cognitive therapy, but individuals who prefer Thinking may receive a very subtle boost to the outcome due to existing practice and preference. Nevertheless, a more robust means of outcome prediction comes from an assessment of initial adaptive functioning.

We found that individuals who preferred Thinking exhibited a greater response to cognitive-based therapy than individuals who preferred Feeling. As noted above, individuals who prefer Thinking also prefer cognitive therapy (Arain, 1968; Carskadon, 1979). Carskadon (1979) also found that individuals who preferred Feeling preferred humanistic therapy. As individuals who preferred Thinking showed greater improvement in cognitive therapy and preferred cognitive therapy (Carska-don, 1977, 1979), it is reasonable to hypothesize that a similar relationship might exist for individuals who preferred Feeling. Specifically, as individuals who preferred Feeling preferred humanistic therapy (Carskadon, 1977, 1979), they may exhibit a greater response to humanistic therapy than individuals who preferred Thinking.

As to what prognostic value the MBTI may hold for psychotherapy, it may first be used to assess a patient's relative strengths, weaknesses, and implicit preferences. Individuals who prefer Thinking are likely to prefer cognitive therapy, so a therapist may be more likely to recommend cognitive therapy to these patients. This is an example of how knowledge about psychological type can allow a psychologist to align his/her therapeutic actions with patients' individual preferences. Although such treatment-matching holds less prognostic value than does an assessment of initial functioning, it does increase the likelihood of providing a therapy in keeping with the patient's existing preferences, thinking, and attitude styles (i.e., personality), and therapeutic receptivity (Carskadon, 1977, 1979). Such a therapeutic style may not significantly change the measureable outcome, but it may strengthen the therapeutic alliance, validate the patient's perspective, and improve initial adherence. In terms of the current results, the fact that the initial functional level had greater predictive value for the cognitive therapy outcome does not discount the therapeutic utility of matching individuals who prefer Thinking with cognitive therapy. For these individuals, cognitive therapy may provide a familiar means of beginning the therapeutic process.

Limitations

The current study is limited by the use of archival data, which did not allow for the specification of a preferred outcome measure. Another limitation of the present study is the potential weakness of GAF as an outcome measure. The GAF scale's observed reliability is inconsistent (Grootenboer et al., 2010; Hanssen-Bauder et al., 2007; Vatnaland et al., 2007; Woldoff, 2004). As noted above, the APA (2013) indicated that the inconsistency in the application of the GAF scale is why it was not included in the DSM-5. The use of existing data also precluded inclusion of other potentially interesting variables such as objective measures of psychopathology. Moreover, the psychotherapy outcome data were obtained from the private practice of a single psy-

chologist (with an INTJ type preference); thus, the results may not be generalizable to other settings, to psychotherapists in other settings, and/or to psychotherapists with different psychological type preferences. Also, another potential methodological issue is that the psychologist collecting the data co-authored the current paper. However, because this study was not planned during data collection and is based on archival data, the potential for experimenter bias was decreased. Possible experimenter bias was further reduced because the first author conducted the analyses. Finally, it is possible that our finding is moderated by preference of therapy, despite the fact that preference of therapy would itself be partially determined by rational function (Thinking-Feeling) preference (Carska-don, 1977, 1979).

Future Directions

Further study of the MBTI psychological types in predicting the psychotherapy outcome should use standardized objective outcome measures, such as the Outcome Questionnaire (Lambert et al., 2004) or the Treatment Outcome Package (Kraus, Seligman, & Jordan, 2005). Objective measures of psychopathology, such as the Beck Depression Inventory-Second Edition (Beck, Steer, & Brown, 1996) and the Beck Anxiety Inventory (Beck & Steer, 1993) should also be used as outcome measures. To evaluate generalizability, future research should be conducted in other settings (e.g., group practice, managed care settings, in-patient settings) and with psychotherapists with different psychological type preferences.

The MBTI may be useful as a treatment planning tool to match individuals who prefer Thinking with cognitive therapy and, potentially, individuals who preferred Feeling with humanistic therapies. Future research might evaluate this hypothesis by using a 2 x 2 randomized quasi-experimental design in which groups of individuals who preferred Thinking and individuals who preferred Feeling are assigned to either cognitive therapy or humanistic therapy. Such a methodology could determine if individuals who preferred Thinking have better outcomes in cognitive therapy versus humanistic therapy and if individuals who preferred Feeling have superior outcomes in humanistic therapy versus cognitive therapy. To evaluate therapeutic style preference, future research is recommended to assess therapy modality preferences a *priori.*

In addition to the moderation hypothesis regarding the rational functional pair, future research might investigate the potentially complex relationships between client MBTI Type, counselor MBTI Type, diagnosis, outcome, and number of sessions. Specifically, it might be hypothesized that certain pairings of client and counselor psychological types produce preferential outcomes; such a relationship might be moderated by therapy type. It might additionally be hypothesized that some psychological types need fewer treatment sessions to improve; as such, the number of treatment sessions could be tested as a moderator of the relationship between type and outcome.

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Appendix A.

MBTI Psychological Types

Psychological type is identified by scores on each dichotomous attitude or function pair of the Myers Briggs Type Indicator. Individuals who answer more Extraversion-Introversion items in the Extraversion direction are assigned the Extraversion attitude preference, while individuals who answer more Sensing-Perceiving items in the Sensing direction are assigned the Sensing function preference, and so forth. The abbreviations for each attitude and function pair follow:

E: Extraversion	versus	I: Introversion
S: Sensing	versus	N: Intuition
T: Thinking	versus	F: Feeling
J: Judging	versus	P: Perceiving

Respondents' preferred attitude and function from each dimensional pair are assembled into a four-letter psychological type. For example, an individual who prefer the Introversion attitude, the Sensing function, the Feeling function, and the Judging function would be assigned the ISFJ psychological type. The specific characteristics of the sixteen psychological types have been described in other writings, and the reader is encouraged to consult existing sources to learn about the various strengths of weaknesses of the sixteen types (Harkness & Lilienfeld, 1997; Myers, McCaulley, Quenk, & Hammer, 1998; Janowsky, 1999; Miller, 1991; Provost, 1993).