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The Effects of Introversion and Treatment Delivery Modality on Therapeutic Outcomes in a
Community Mental Health Clinic

by

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Master of Science
in Psychology
Florida Institute of Technology
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Bachelor of Arts
in Psychology
Ohio University
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in Clinical Psychology

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Abstract

Title: The Effects of Introversion and Treatment Delivery Modality on Therapeutic Outcomes in a Community Mental Health Clinic

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Objective: The present study examines the effectiveness of teletherapy services for individuals with varying levels of introversion. This study also investigates the comparability of teletherapy to in-person services provided by clinicians in training.

Introduction: Virtual platforms, such as teletherapy, have exponentially increased in use by clinicians and community members due to the Covid 19 pandemic. The pandemic has illuminated surprising secondary benefits of teletherapy. Research has shown that teletherapy results in greater accessibility, feasibility, and acceptability of treatment. Teletherapy platforms can reach remote and rural communities, and better address financial and time barriers. Current research indicates that teletherapy services are comparable to face-to-face services in efficacy and effectiveness in treatment outcomes. Individuals with high levels of introversion tend to struggle with emotion regulation, have greater adjustment-related distress, encounter more psychological difficulties, and have poorer treatment outcomes. However, few studies have examined the relationship between pre-treatment factors (e.g., personality traits) and teletherapy services, on determining treatment outcomes. In clinical practice, personality testing is frequently used to inform treatment planning, clarify diagnostic impressions, and provide treatment prognosis.

Method: Archival data obtained over two years from a community mental health training clinic from a total of 56 patients. The data was used to retrospectively gather study-relevant details in addition to demographic information. Participants were included in the study if they produced a

valid MMPI personality assessment profile, completed the OQ-45.2 instrument at initial and final timepoints, received psychotherapy treatment either via teletherapy or in-person, attended three or more sessions, and were at least 18 years old. The present study consisted of N=54 participants.

Results: Findings revealed introversion is not a significant predictor of treatment outcome. Treatment outcome scores are not significantly different between teletherapy and in-person treatment services. There are no interaction effect between introversion and treatment delivery modality on treatment outcome. Exploratory analyses showed a moderate positive correlation between introversion and initial OQ-45 scores. OQ-45 scores significantly improved from baseline to final timepoints. There was no significant difference between MMPI-2 and MMPI-3 INTR scores. Initial OQ-45 scores were not significantly different between pre- to post pandemic timepoints.

Conclusion: The overall results of this study suggest varying levels of introversion and treatment delivery modality do not impact treatment outcome. However, higher INTR (introversion) scores were associated with higher initial distress levels. Teletherapy is as effective as in-person psychotherapy. There was a significant improvement in distress levels (as measured by the OQ-45) from pre- to post treatment.

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Chapter 1 Teletherapy

Increased Utilization of Teletherapy Services

The onset of the COVID-19 pandemic drastically impacted individuals globally, requiring unprecedented change and adjustment across multiple domains of life. The pandemic had varying impacts, especially with quarantine and shelter-in-place mandates. There is seemingly no clear beginning nor end to the pandemic, with both -medical and mental health concerns - lingering to date. With the imposition of shelter-in-place mandates, people experienced shifts in quality of interactions as they adapted to relying primarily on telecommunication modalities to remain connected. The quality of telecommunications used during the pandemic brought into question the value of teletherapy services, as this soon became the primary therapy modality offered by clinicians.

In light of the pandemic, traditional face-to-face therapy rapidly shifted to virtual (telehealth) therapy services (Pfefferbaum & North, 2020; Zhou et al., 2020). Teletherapy hastily transitioned from a previously adjunct treatment modality to the status quo method of treatment delivery (Markowitz et al., 2021; Pierce et al., 2021; Sammons et al., 2020). The proportion of teletherapy services astronomically surged to 85.3% in 2020 in comparison to 43% prior to the pandemic (Pierce et al., 2021; Glueckauf et al., 2018). The utilization of teletherapy has substantial implications for mental health care providers and patients. In response to the heightened health risks posed by COVID-19 and subsequent government regulations placed on health professionals providing in-person care, teletherapy served to ensure continuity of care and allow for patient accessibility to treatment services (Greenhalgh et al., 2020). In 2020, The National Institute of Mental Health (NIMH) estimated that 52.9 million adults (18 years and older) are living with a mental illness in the United States, representing 21.0% of the adult

census population (NIMH, 2020). This clearly indicates mental illnesses are common, as rates of one in every five adults struggle with some degree of a mental illness (NIMH, 2020) Furthermore, 24.3 million (46.2%) of the 52.9 million adults with any mental illness sought mental health treatment during 2020 (NIMH, 2020).

Origins of Teletherapy

Historical roots of traditional in-person psychotherapy treatment

In its rawest form, "in-person therapy" refers to traditional psychotherapy model that is rooted in face-to-face interactions between patients and therapists (Dowell & Borman, 2013; Castelnuovo, 2003). Traditional forms of psychotherapy have historically prospered in effectiveness from the combination of nonverbal and verbal cues that unfold within the therapy room (Dowell & Borman, 2013). Through empirically sound psychotherapeutic interventions, clinicians guide patients toward self-discovery of underlying emotional concerns to further aid in modifying behaviors, thoughts, and emotions (Chisolm, 2011; Lane, Quintar, & Goeltz, 1998). The evolutionary implications of traditional psychotherapy have progressed to include many psychotherapy models, such as Dialectical Behavior Therapy (DBT), Cognitive Behavior Therapy (CBT), Acceptance and Commitment Therapy (ACT), and Humanistic approaches; all of which have theoretical groundings in Psychodynamic Therapy. Psychotherapeutic interventions across these various models demonstrate efficacy and effectiveness in treating mental health disorders (Chisolm, 2011).

Telehealth services, delivering a wide range of healthcare services, from medical-based care to mental health care, was first introduced during the 1950s. During this time, technological advancements seeped into various aspects of life, and soon thereafter became an established form of treatment delivery provided by healthcare professionals (Vockley, 2015).

It was not until the early 2000s with the emergence of the internet and rise in personal computers in the home (Lin et al., 2021) that virtual teletherapy services became popularized. Virtual teletherapy services were first seen through companies, such as Talkspace and BetterHelp, that offered therapy through text-messaging and videoconferencing formats and allowed for accessibility and affordability to the public (Burgoyne & Cohn, 2020). However, the provision of therapy services via electronic modalities was met with initial resistance from health care providers (Schröder et al., 2017; Bischoff et al., 2004). The quality of a virtual therapeutic relationship, the effectiveness of virtually delivered therapeutic interventions, the ability to conduct risk management for high-risk clients, and confidentiality breaches, are shared concerns with respect to teletherapy services.

However, Burgoyne and Cohn (2020) revealed that teletherapy can function as a suitable option as it reaches more individuals in the community in need of treatment. Furthermore, in a survey administered to clients, Burgoyne and Cohn discovered that 86% of clients and 80% of staff perceived teletherapy as a viable resource for providing and receiving high-quality care (Burgoyne & Cohn, 2020). Previous studies illuminate the benefits of teletherapy for clients, including provision of services to rural, hard-to-reach populations, feasible accessibility for individuals with disabilities, and other populations in its application of providing services who may not otherwise attend face-to-face psychotherapy (Penchansky & Thomas, 1981; Griffiths & Christensen, 2007; Migone, 2013). Time constraints, financial strains, transportation problems, and mental health stigma are often cited as reasons why individuals may not seek in-person treatment services (Burgoyne & Cohn, 2020; Marques et al., 2010; Mohr et al., 2008). Teletherapy can bypass these barriers and create feasible access to psychotherapy (Brenes et al., 2011; Kafali et al., 2014). Teletherapy services are also advantageous for delivering therapy for

patients with severe and chronic medical conditions, such as terminally ill cancer patients (Cluver et al., 2005; Shepherd et al., 2006). It is also beneficial in reaching psychiatric populations for medication management (Ruskin et al., 2004).

Teletherapy Research

The term “Teletherapy” refers to the delivery of mental healthcare services by clinicians through technology, ranging from audio- and/or videoconferencing to virtual self-help applications, as well as asynchronous and/or synchronous texting, (Lin et al., 2021). Teletherapy can be referred to in multiple terms (e.g., teletherapy, cyber-counseling, telehealth therapy). For consistency purposes of the present study, the term “teletherapy” will be used with the primary focus of providing teletherapy via a videoconferencing platform.

Efficacy and effectiveness of teletherapy

In many aspects, teletherapy services indicate similar levels of effectiveness and efficacy as traditional face-to-face psychotherapy services (Acierno et al., 2016, 2017; Yuen et al., 2015; Luxton et al., 2016; Stubbings et al., 2013; Matsumoto et al., 2018). Teletherapy is comparable to in-person therapy in treating a wide range of psychological disorders (Egede et al., 2015; Zerwas et al., 2016; Catarino et al., 2018) including depression (Griffiths et al., 2006; Egede et al., 2015;), anxiety (Stubbings et al., 2013; Catarino et al., 2018), posttraumatic stress disorder (PTSD; Wierwille et al., 2016; Acierno et al., 2017; Varker et al., 2019), adjustment disorders (Varker et al., 2019), eating disorders (Mitchell et al., 2008; Zerwas et al., 2016), and alcohol use disorder (Frueh et al., 2005).

To synthesize the literature demonstrating the effectiveness of telehealth vs. in-person treatment, meta-analyses by Mohr et al. (2008) and Osenbach et al. (2013) included 12 telephone-based therapy trials and 14 videoconferencing therapy studies and found these

teletherapy modalities significantly effective in treating depression (Mohr et al., 2008; Osenbach et al., 2013). Studies have since expanded the efficacy of teletherapy in treating other disorders, such as symptoms of obsessive-compulsive disorder (Wootton, 2016). Research findings reveal teletherapy is a more suitable treatment option compared to in-person therapy for individuals with anxiety disorders, particularly social anxiety (Bouchard et al., 2004), panic disorder (Bouchard et al., 2020), and generalized anxiety disorder (Bouchard et al., 2004; Stubbings et al., 2013; Chiauzzi et al., 2020; Watts et al., 2020). In a recent study examining individuals diagnosed with borderline personality disorder in a partial hospitalization program, Zimmerman et al. (2022) found teletherapy comparable to in-person services.

Thomas et al. (2021) conducted a recent review of empirical literature on teletherapy. The study reviewed 54 articles, including 21 Randomized Controlled Trials, 20 pre- to post-treatment nonrandomized comparison trials, six case series, four qualitative studies, and three studies examining rates of teletherapy uptake. The review underscored the efficacy of teletherapy services and found this service delivery modality is effective for adults with a variety of mental health disorders with several evidence-based treatments. Across studies, research participants typically reported having little difficulty establishing a therapeutic alliance. Furthermore, participants generally considered the teletherapy atmosphere less intense and felt less self-conscious and pressured when interacting with their therapist (Thomas et al., 2021).

Treatment interventions conducted via teletherapy included cognitive processing therapy, cognitive behavioral therapy (CBT), prolonged exposure for PTSD, behavioral activation, and acceptance-based interventions for social anxiety disorder (Thomas et al., 2021). Interventions were adapted to teletherapy. Adaptations were helpful in certain circumstances, such as conducting exposure exercises in the participant's home. However, meditation and visual

imagery were not as beneficial via teletherapy (Thomas et al., 2021). These findings suggest there are unique benefits from both teletherapy and in-person services, but limitations must be considered when choosing a treatment modality.

Kofmehl (2017) sought to determine how certain demographic variables (i.e., age, region, race) and personality traits of extraversion/introversion influence a client's choice to utilize face-to-face psychotherapy versus online psychotherapy. The quantitative correlational design included 301 participants interested in seeking psychotherapy treatment services. Survey respondents were between the ages of 18 to 96 (72.8% White, 44.9% male and 53.2% female). Among other measures administered, respondents completed an online survey: personality traits of Introversion/Extraversion, as assessed by the Big Five Inventory (BFI), and likelihood to use online therapy, measured by the E-therapy Attitude Scale (Finn, 2002). Findings showed that personality traits of Introversion and Extraversion had no significant relationship with a participants' inclination to utilize online therapy versus in-person therapy (Kofmehl, 2017). Determining factors of age and comfort with technology may be stronger determining factors for individual's decision to pursue online therapy. For instance, Kofmehl (2017) suggested that age and level of comfort with technology may be more influential on an individual's decision to use teletherapy. Introverts in particular take comfort in computer-mediated communication, while extroverts prefer face-to-face interactions (Zia & Malik, 2019). In general, younger individuals report greater ease navigating technological devices (Dutton et al., 2009). This is intuitive, such that younger populations on average spend more time on the Internet than older populations (Kalmus et al., 2011; Dutton et al., 2009). Therefore, independent from personality factors, age and comfort with technology may be the driving forces behind one's decision to use teletherapy

(Silverman, 2013). As such, clients perceive comparable satisfaction of therapy delivered via teletherapy and in-person.

One study conducted by Zainudin et al. (2019) investigated the effectiveness of teletherapy services based on personality traits and clients' level of satisfaction between in-person versus teletherapy services. A quasi-experimental research approach utilized the Non-Equivalent Pre & Post Test design and consisted of two groups (N = 60; 13-17 years old). Participants were administered the Junior Eysenck Personality Inventory to determine Introvert and Extrovert personality types. Study findings indicated that client satisfaction was not influenced by introvert/ extrovert personality traits on treatment modality type (Zainudin et al., 2019). This suggests that the client's personality has no relationship with client satisfactions teletherapy services. Client satisfaction on treatment modality type may be due in part to the quality of care provided by therapists on teletherapy formats, rather than personality traits. Other factors, such as the quality of the therapeutic relationship, feasibility and accessibility to treatment services, and comfortability with technology use, may have a larger influence on a client's decision to utilize teletherapy services, and to feel more satisfied with the quality of care delivered. However, given the participants in this study were of adolescent age, it may be likely that their personality has yet to reach a stable state at this developmental stage in their lives. The unstable nature of their personality development may inversely serve to manipulate the study findings. The aim of the proposed study seeks to address this potential barrier by replicating the experimental design with the sole focus on an adult population in a community mental health sample. Furthermore, it is important to address these barriers in order to integrate in clinical psychology training programs.

Provisions of Teletherapy by Clinicians in Training

In clinical psychology training programs graduate students frequently begin to develop and refine their clinical skills by providing therapy to clients in university training clinics. Previous research demonstrates that clinicians-in-training can effectively provide quality care to clients who present to treatment with a wide range of presenting difficulties and mental health disorders (Cukrowicz et al., 2005; Ost et al., 2012). According to Westbrook and Kirk (2007), student clinicians show comparable rates of recovery for clients as to experienced clinicians in community mental health clinics. This is further supported by a meta-analysis conducted by Lin et al. (2021), which demonstrated comparable treatment outcomes for therapy delivered via teletherapy and in-person. However, findings from the randomized clinical trials indicated that student clinicians encountered higher client attrition rates in teletherapy than did licensed therapists (Lin et al., 2021). Additionally, therapy delivered via videoconferencing by clinician trainees were at a greater risk for higher dropout rates than telephone-based therapy. These findings suggest student clinicians may experience more difficulty in establishing a therapeutic alliance on teletherapy as compared to experienced clinicians, which is associated with client attrition rates (Sharf et al., 2010).

For instance, in a study conducted by Chen and Keenan-Miller (2007), study findings indicated that, by session 11, 50 percent of clients with a student clinician in therapy had exhibited clinically significant change and 70 percent by session 20. In terms of rates of clinically significant change for clients seen by seasoned clinicians, therapy conducted by student clinicians show comparable rates of clinically significant change (Chen & Keenan-Miller, 2007). Given the comparable recovery rates among in-person therapy delivered by

student clinicians and licensed clinicians, understanding barriers in teletherapy can further address individual factors to reduce client dropout.

While previous researchers have established similar rates of recovery for clients, whether seen by student clinicians or experienced clinicians in a traditional in-person therapy format, very few studies have explored the role teletherapy has on treatment outcomes conducted by student clinicians. One such study by Rowen et al. (2022), sought to assess the effectiveness of teletherapy (videoconferencing) conducted by student clinicians on treatment outcomes in a community adult outpatient mental health training clinic. The Outcome Questionnaire (OQ), was utilized in this study to measure client progress and treatment outcome. Findings indicated there was a significant reduction in clients' scores of overall distress levels from baseline. However, relatively 21 percent of clients yielded equal to or higher OQ scores at termination compared to their baseline scores. In correspondence to a previous study, Hansen et al. (2002) demonstrated that approximately 57 percent and 9 percent of clients in university counseling centers show no change or deteriorate from initial to discharge sessions, respectively. These findings remain comparable to recovery rates conducted by experienced clinicians (Lambert, 2013). However, the comparability of clinicians in training delivering services via teletherapy remains largely understudied. Therefore, future studies should incorporate a comparison group of clients attending in-person versus teletherapy services to investigate the driving forces clinicians in training may have on outcome as a product of treatment modality format. As teletherapy serves as a viable option, establishing and updating clinical psychology curricula to match the growing demand is essential. That is, training in teletherapy to boost clinicians' competencies may result in achieving better treatment outcomes for individuals seeking therapy. As it is important to determine factors that may improve client outcome via a teletherapy format, so too is identifying

individual personality traits that may better align with in-person or teletherapy treatment modality.

Personality

Trait Theory

Trait theory asserts that personality traits are stable and persistent across different situations and time (McCrae & Costa, 1990). Traits emerge from biological predispositions and are expressed as a function of the environment (Barlow et al., 2014). Based on nomothetic theory, it posits that traits are continuously and normally distributed, and a subset of measurable traits can explain individual characteristics amongst humans. Thirty-eight percent of the population falls in the “average” range for a given trait, 24 percent falls in the “high” or “low” range for a trait, and seven percent falls in the “very high” or “very low” range for a trait (Costa & McCrae, 1988b). Traits develop throughout childhood and reach a level of stability in adulthood. One such structure, the Five Factor Model (FFM), is rooted in trait theory and serves to describe personality traits in a broad, multi-dimensional format.

The Five Factor Model

The Five Factor Model (FFM) is a well-established theory of personality structure and organization. The FFM theory postulates that personality can be explained by five broad dimensions of personality: openness, conscientiousness, extraversion, agreeableness, and neuroticism.

History of the Five Factor Model

While the FFM was developed in the 1980s, the theory has a longstanding history extending back to the 1930s when McDougall (1992) proposed that personality could be broadly categorized into five distinct and distinguishable factors. Factor analysis on the FFM was

performed by Thurstone (1934), using 60 trait adjectives that fit a five-factor model of personality (McDougall, 1932; Thurstone, 1934). Cattell (1933) developed 46 bipolar rating scales (i.e., assertive vs. submissive; easily upset vs. unshakable poise) and had 62 male college students rate a well-known peer on these scales. Cattell's study yielded five factors closely related to the contemporary model which included conscientiousness and surgency as well as factors that closely approximated agreeableness and neuroticism (Cattell, 1933).

The FFM proposed by Cattell underwent rigorous research by early pioneers to replicate this model. Fiske (1949) used 22 of Cattell's original bipolar scales on a population of Veteran's Administration trainees. The trainees received self-rating in addition to ratings from a close peer and supervisor. Fiske also conducted factor analysis individually on the three sets of ratings and found evidence for a five-factor structure of personality, including factors that approximate extraversion, emotional stability, and agreeableness. Other factors that do not approximate the contemporary model included, inquiring intellect and confident self-expression, with the latter overlapping with the extraversion factor (Fiske, 1949). Attributes that loaded onto extraversion included words such as cheerful, talkative, and adaptive while words such as readiness to cooperate, trustful, and good-natured fell under the agreeableness factor (Fiske, 1949). The results were relatively stable across the three sets of ratings which further supports the stability of the five-factor structure proposed by Cattell.

These initial studies were followed by Tupes and Christal (1961) replicating Fiske's research. The study included 30 of Cattell's bipolar scales on eight populations who conducted peer ratings: male graduate students, male officer candidates, Air Force Command students, and male and female college students as well as the supervisor and peer ratings used in Fiske's study (Tupes & Christal, 1961). The results of the study provided additional support to a broad, five

factor model despite the differences in sample size, the duration participants knew each other, or level of acquaintanceship. The five factors identified were surgency, agreeableness, dependability, emotional stability, and culture. Thus, the findings from this study simulated previous research, and provided additional support for a five-factor model of personality structure regardless of discrepancies across what each factor is composed of and how it is defined. Tupes and Kaplan (1961) further evidenced support for a five-factor structure inadvertent of whether socially desirable or socially undesirable attributes were analyzed through factor analysis (Tupes & Kaplan, 1961). This is a salient finding as it suggests evidence of a multidimensional model of personality explained by the five-factor structure rather than solely disordered personality structure. Norman (1963) and Smith (1967) in their research utilized a population of college students to rate their peers using Cattell's bipolar scales. Both studies yielded findings in support of the five-factor structure (Norman, 1963; Smith 1967). Similarly, Borgatta (1964) converted Cattell's bipolar scales into short sentence stems (i.e., Is assertive) and included a population of members in a fraternity and sorority to rate their peers on these attributes. The results, despite differences in methodology, supported a stable, five-factor structure with factors including assertiveness, likability, responsibility, emotionality, and intelligence (Borgatta, 1964).

The 1960s and 1970s introduced the era of behaviorism, which led to skepticism and rejection of studies positing a five-factor model of personality structure. Regardless of promising evidence and replications of the findings, the five-factor model stagnated for nearly twenty years. It was not revisited until the 1980s when Costa and McCrae dispersed strong research findings for the five-factor model. The five-factor structure to current date comprises of openness, agreeableness, conscientiousness, extraversion, and neuroticism (Costa & McCrae, 1985).

Further research was conducted by Costa and McCrae to strengthen the evidence for their model, which helped it gain momentum in the field of personality psychology (Costa, 1991; Costa & McCrae, 1985, 1988a, 1988b, 1992; Costa, McCrae & Dye, 1991; McCrae, 1992; McCrae & Costa, 1985; McCrae and John, 1992).

The Five Factor Model and Personality

The FFM provides a framework for personality structure and asserts that humans maintain a distinct set of personality traits that influence behavior, thoughts, and feelings. The model originates from trait theory, which asserts that personality traits are stable and persistent over time and across different situations (McCrae & Costa, 1990). The structure of personality is hierarchical in nature such that each factor is defined by many specific traits. In other words, each factor serves as a broad facet which include other sub-trait clusters around. For example, the conscientiousness factor encompasses separate but relative descriptors to define this construct (e.g., Including competent, dutiful, and achievement striving). Additionally, each factor is orthogonal, meaning traits that are clustered together within a specific factor are separate and independent from other factors.

Contrary to the nomothetic approach, idiographic approaches, which dominated the field of psychology during the 1960s and 1970s, emphasize use of qualitative data and observable behavior at the level of the individual. This approach posits that there are an infinite number of unique possibilities of personality, which makes is difficult and time-consuming to develop and test theories to explain psychological functioning. The development and attention given to nomothetic theories allowed for more precise measurement of personality traits through use of factor analysis. Trait theory and the FFM led to a rise in the development and use of

psychometrically sound instruments for assessing personality and how it may subsequently predict outcomes across a variety of contexts (i.e., clinical, medical, occupational).

The FFM model also seeks to explain broad questions about human nature and personality development that grand personality theories have attempted to reconcile for decades. These include the debates of freedom versus determinism, extrinsic versus intrinsic motivation, and humans as essentially good versus selfish. The FFM offers a balance between the extreme poles of these philosophical questions by supporting the notion that humans have individuality but are not immeasurably unique.

Interaction of personality traits and mental health disorders

According to Vigo, Thornicroft, and Atun (2016), mental illness is one of the primary sources of disease burden worldwide. Mental illness not only has ramifications at the global level, but it also unsurprisingly has grave impacts for the individual and consequently results in greater economic strain on mental health services. The purpose of this study intends to investigate the effectiveness of teletherapy formats for individuals with varying levels of introversion, which has been shown to impact both mental health in general (Tellegan, 1985) and treatment outcomes in particular (Bucher et al., 2019).

Previous studies have unequivocally shown the significant association between personality traits and mental health disorders (Malouff et al., 2005; Kotov et al., 2010). In particular, mental health disorders are commonly hallmarked by individuals who score high on neuroticism, low on conscientiousness, and low on extraversion (Malouff et al., 2005; Kotov et al., 2010).

One such personality trait, introversion, has taken the spotlight in many research studies in the field. Individuals who score high on introversion tend to be reserved, timid, and quiet, while extraversion is characterized as being more social, gregarious, and bold (Wilson, 1967). In the 1940s, Hans Eysenck pioneered the dimension of introversion-extraversion and distinguished the trait from neuroticism-stability (Eysenck & Eysenck, 1985). His personality model was developed both theoretically and empirically. Eysenck formed a physiological theory of traits, contending that extraversion is in response to chronic under-stimulation, and that extraverts seek remedial stimulation in "risky, social, and generally active behavior (Zelenski et al., 2013)." Introverts, on the other hand, satisfy their stimulation needs with greater ease and prefer quieter activities since they may become over-stimulated in highly social contexts (Eysenck & Eysenck, 1985) Individuals scoring higher on extraversion report higher levels of happiness (DeNeve & Cooper, 1998) and greater life satisfaction than their introverted counterparts (DeNeve & Cooper, 1998; Lucas & Fujita, 2000; Steel et al., 2008).

The growing body of literature highlights how individuals with high levels of introversion tend to have fewer social interactions, experience emotions more intensely, struggle more with emotion regulation, have greater adjustment-related distress, and generally encounter more psychological problems as to their counterpart of a higher score on extraversion (Lucas & Dyrenforth, 2008; Jylhä et al., 2009; Fadda & Scalas, 2016). Introversion is linked to mental illness (Roy, 1998; Shokrkon & Nicoladis, 2021), with speculations that this trait corresponds to depression and social anxiety (Naragon-Gainey et al., 2009).

History and Development of the MMPI-2

The Minnesota Multiphasic Personality Inventory (MMPI), an objective measure of personality and psychopathology, is a widely used inventory in the U.S. and across the world

(Archer, 2005; Butcher, 2010; Friedman et al., 2001; Greene, 2011; Lubin, et al., 1984; Lubin et al., 1985). Psychologists and mental health professionals utilize the MMPI as a multidimensional tool to assess personality traits and psychopathological disorders in clinical settings (Archer et al., 2006). The personality measure has also shown notable benefits for clinicians, including to help assess new patients for underlying psychopathology, to inform treatment planning, for diagnostic clarity, and to assist in case formulations in conjunction with information gathered from clinical interviews (Freidman et al., 2014).

The longstanding and widespread use of the MMPI is credible as it contains several validity scales, cross-cultural applicability, and thousands of empirically sound correlates (Freidman et al., 2014). For instance, the personality measure contains validity scales to detect profile distortion in the form of over and underreporting, defensiveness, carelessness, and response bias. The MMPI clinical scales measure various domains of psychopathology, such as psychosomatic complaints, depression, psychopathic deviance, paranoia, anxiety, psychoticism, hypomania, social discomfort (introversion), and underlying personality traits and pathology.

The MMPI instrument is also suitable and widely utilized across multiple settings, including medical settings, forensic settings, outpatient and inpatient mental health care facilities, and in conducting child custody evaluations (Otto & Collins, 1995). For example, personality assessment is widely used to evaluate the presence of psychological components of physical complaints (Osborne, 1979) serving to aid medical and clinical practitioners. Another uniquely beneficial contribution of the MMPI is the instrument's use in predicting treatment outcomes and an individual's response pattern to various treatment approaches, with empirically supported treatment prognosis indicators (Osborne, 1979).

Historic developers of the original MMPI, Starke R. Hathaway and J.C. McKinley, first published the personality inventory in 1943. In its developmental phase, the creation of the MMPI was designed to efficiently detect psychopathology in clinical settings. To create the eight original MMPI Clinical scales, Hathaway and McKinley employed an empirical criterion-keying method, by first generating a large pool of prospective items and subsequently distinguishing the responses of diagnosed patient groups to those of non-clinical patient groups (Freidman et al., 2014). That is, the MMPI was constructed in a true and false format and administered to patients with existing psychopathology in hospital settings and furthermore contrasted with nonpatients who were the patients' family members. Eight sets of content items were identified that differentiated specific patient groups who were affiliated to the diagnosis given, from nonpatients, through findings from statistical analyses. The item sets were converted into eight Clinical Scales, which included hypochondriasis, depression, hysteria, psychopathic deviance, paranoia, psychasthenia, schizophrenia and hypomania (Freidman et al., 2014). Additional analyses culminated scales measuring masculinity/femininity and social introversion, resulting in the inclusion of these scales to the set of basic scales (Hathaway & McKinley, 1990).

Hathaway and McKinley (1943) used an Empirical Criterion-Keying Method to develop the eight original Clinical Scales. This method entailed constructing a large pool of prospective items and discriminating the responses of clinical patient groups from non-clinical patient groups. The criterion-keying method involves administering items to two or more contrasting groups: a criterion group and comparison group. The criterion group is homogenous for a specific diagnosis or cluster of characteristics and is contrasted with a comparison group that does not share the same characteristics as the criterion group. Items to which the criterion and comparison group respond statistically differently are included on the scale being developed

while items to which the two groups respond similarly are not included. This method centers on the inclusion of items based on criterion group endorsement rather than face-valid items that unmistakably represent a certain construct. Carefully selected patients from a psychiatric unit were recruited to represent the eight criterion groups for the MMPI. They are as follows: hypochondriasis, depression, conversion hysteria, psychopathy, paranoia, psychasthenia, schizophrenia, and hypomania. The comparison group consisted of 724 friends and relatives of patients being seen at the University of Minnesota Hospital outpatient department (Freidman et al., 2014).

The Empirical Criterion-Keying Method approach was unique from existing personality measures which were face valid and governed by a rational constructed approach (Simms, 2008). This approach attracted critics as the rational construction method inaccurately discriminated between normal and abnormal personality functioning. This method is a deductive strategy where items are developed and selected based on representation of a specific construct, hence being critiqued for its face valid format. This renders detection of profile distortion in the positive (i.e., underreporting of problem areas) or negative (i.e., malingering of problem areas) direction difficult. With the criterion-keying method, items are less face-valid and could therefore detect profile distortion and abnormal psychological functioning more accurately (Freidman et al., 2014). Thus, the development of the MMPI reflected the goal of constructing a personality measure that can aid in more accurate diagnostic assessment of psychopathology across clinical settings, as it is based on observable, scientific criteria rather than pure theory or face validity.

The original MMPI has since been updated with several revised forms, including the MMPI-2 (Butcher et al., 2001), MMPI-A (Butcher et al., 1992), MMPI-2-RF (Ben-Porath &

Tellegen, 2008), and most recently, the MMPI-3. The development of the MMPI-2 served to address primary goals of collecting new standardized norms and updating the test items. The initial diagnostic model was updated to reflect the broader goal of evaluating typical and atypical personality pathology, disordered psychopathology, and behavioral predilections (Freidman et al., 2014). The MMPI re-standardization committee ascertained that the original MMPI item pool insufficiently addressed multiple assessment concerns that the committee deemed essential (e.g., suicidal ideation, psychotherapeutic treatment accessibility, problems in the workplace, etc.; Freidman et al., 2014). The MMPI-2 normative sample included a large (N=2,567), nationally representative and ethnically diverse sample of adults between the ages of 18 and 85. Subsequently, the innovations updated the normative sample to maintain consistency with the then-current U.S. census numbers and updates to the test item pool to ameliorate items deemed offensive on the original MMPI. While the re-standardization committee sought to maintain co-linearity across revised versions of the MMPI, refined versions concurrently sought to strengthen the constructs. Measured by the Clinical Scales (e.g., anxiety, depression, introversion) and developed new scales to assess other realms of personality and pathology (e.g., fear, anger, family conflicts; Ben-Porath & Tellegen, 2020).

Development of the MMPI-2 PSY-5 Scales

The MMPI's secondary scales were developed from the Five Factor Model (FFM) framework. The Personality Psychopathology Five (PSY-5; Harkness & McNulty, 1995; Harkness et al., 2002) scales was a significant new addition to the MMPI-2. Using a Replicated Rational Selection (RRS) method, the PSY-5 scales are a set of five scales developed as a blueprint measure that represents the major dimensions of personality pathology (Harkness et al., 1995). This method is a deductive approach used to develop test items based on a defined

construct. Candidate items were chosen and further refined to remove items with high correlations on other scales (Harkness et al., 1995). The five scales include Aggressiveness (AGGR), Psychoticism (PSYC), Disconstraint (DISC), Negative Emotionality/Neuroticism (NEGE), and Introversion/Low Positive Emotionality (INTR).

Extensive statistical analyses conducted by Graham (2002) provided strong psychometric properties of the PSY-5 scales. Revised MMPI forms, like the MMPI-2-RF and MMPI-3, incorporated revised versions of the MMPI-2 PSY-5 scales (Harkness et al., 2014) to maintain a representative normative sample of the general population and to refine item scales to increase congruency of content items and personality constructs being measured. The PSY-5 model underwent multiple replication studies to solidify the PSY-5 scales that appear on the MMPI-2, MMPI-2-RF, and MMPI-3 forms. Many studies have established empirically sound data that support the psychometric properties within, and between the MMPI forms. A detailed psychometric analysis will be provided under the methods section.

Given The Five Factor Model of normal personality is based on a Lexical Approach of trait descriptive terms, there are distinct contrasts in comparison to the PSY-5 scales' intended use. Harkness and McNulty (1994) contended that measures based on such models, such as the Neuroticism, Extraversion, and Openness Personality Inventory (NEO-PI; Costa & McRae 1985), lack in clinical assessment and description in addressing personality pathology, especially in patients with personality disorders (Trull et al., 1995), as the premise of five factor models are derived from pure theoretical terms. Thus, the PSY-5 scales address the need for clinical utility in measures to further aid in diagnostic clarification, informed treatment planning, and more accurate case formulations (Harkness & McNulty, 2006).

Research by Tackett et al. (2008) revealed evidence for a five-factor structure similar to the MMPI PSY-5 scales in a sample of first-degree relatives of individuals with schizophrenia, schizoaffective disorder, and bipolar disorder (Tackett et al., 2008). Watson et al. (2008) found evidence for a six-factor model that included four of the five factors encompassed by the PSY-5 scales (Watson et al., 2008). These replication studies provide evidence for and support of the PSY-5 scales. Additionally, the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) proposed a dimensional model for personality disorders that recommended individuals be assessed on five broad traits domains largely reminiscent of the PSY-5 scales, including detachment, antagonism, disinhibition, and psychoticism (American Psychiatric Association, 2010) furthering strengthening the rationale to utilize these scales as part of personality assessment.

Moreover, the PSY-5 assesses not symptoms, but are used to assess personality traits, and thus, measuring long-lasting and stable pathology. Not only can the five scales aid in detecting the chronic nature of the problem, but also in determining underlying personality traits and pathology that can be useful for informing treatment planning (Harkness & McNulty, 1994). The present study will examine effects of introversion, as assessed by the PSY-5 scales of the MMPI-2 and MMPI-3.

As for treatment outcomes of symptomatology and improvement, findings demonstrated a significant link with extraversion, such that higher levels of this trait elicited greater reduced symptomatology and general improvements at follow-up, even more so than the other big five personality traits (Bucher et al., 2019). For instance, a higher likelihood of seeking social support (Lysaker et al., 2004), a prominent characteristic of extraversion, suggests that extraverted individuals engage in treatment more effectively (Beauchamp et al., 2011) compared to

individuals higher on introversion. That is, due in part to the social nature of feeling more comfortable to express emotions and actively engage in treatment, symptom reduction and overall improvement at follow-up is tied with the trait of extraversion. These individuals in particular may benefit from traditional in-person psychotherapy as compared to high introversion.

Previous studies have investigated whether certain personality traits are predictive of treatment outcomes via online therapy (Spek et al., 2008; Kofmehl, 2017), however, much remains unknown. Addressing this gap in literature could have significant implications in analyzing whether teletherapy is just as effective for clients with particular personality traits. Additional research is warranted on this modality as teletherapy evolves and has persistently grown to be a suitable and valuable option for clinicians and clients. In a meta-analysis, Bucher et al. (2019) investigated the relationship between personality traits and therapeutic outcomes across 99 studies, utilizing a common framework of the five-factor model domains. Overall results supported the notion that personality traits are indeed linked to distinct psychotherapy outcomes, with certain associations between traits and outcomes corresponding to a priori framework (Bucher et al., 2019).

Therapeutic Outcome

Research on psychotherapy treatment outcomes has exponentially increased over the past few decades. The medical model, based on the conduction of rigorous randomized clinical trials in developing evidence-based treatments (EBTs), has since been espoused by the field of psychology to treat various mental health disorders. Previous studies demonstrate that only 50 percent of clients consistently improve following their engagement in psychotherapy (Weston et al., 2004), making this research essential. To maximize treatment efficacy, it is crucial to both

further develop and refine EBTs and to identify the unique factors of clients that contribute to or hamper treatment outcome.

History of Measuring Therapeutic Outcome

From a historical lens, the operationalization of therapeutic outcome has relied on the therapist's' theoretical orientation. Stemming from psychoanalysis, Freud set lofty goals for his clients, which looked at insight and morality as the goals for therapy (Lambert, 2013). These therapy goals were to be achieved through rigorous psychotherapy sessions, that were as frequent as four times per week and, at times, lasting over a year's time. However, these therapy goals were merely impossible to measure in a clinically meaningful way, which led to a neo-analytic conceptualization of self-actualization, which was even more impossible to measure or operationalize (Lambert, 2013).

Following the emergence of alternative psychotherapy models from psychoanalysis, the conceptual understanding of therapeutic change consequently underwent its own transformations. Meaningful therapeutic outcome carries various operational definitions that were seemingly contingent on the theoretical framework therapists' use (Lambert, 2013). For instance, humanistic therapists conceptualize change through a lens of guiding clients to reach self-actualization through unconditional positive regard, congruence, and empathic understanding (Rogers, 1967). Cognitive therapists achieve change through modifying maladaptive thoughts and faulty underlying core beliefs, while behaviorists are problem-focused, and change is met secondary to observable adaptations made in one's behavior (Beck, 2011). Despite varying definitions of therapeutic change across theoretical frameworks, researchers point to the "Dodo Bird" conjecture, in reference to the claim that all empirically supported psychotherapies elicit comparable therapeutic outcomes, regardless of the unique components

each one offers (Budd & Hughes, 2009).

The field nonetheless remains challenged in adequately defining therapeutic outcomes, for reasons that transcend above rivaling schools of therapy. Unsurprisingly, symptom reduction is an example of a quintessential psychotherapy goal (Cuijpers, 2019), which makes pragmatic sense, given that clients frequently seek relief from their presenting concerns and symptoms. That is, a symptoms-based categorical approach in which the efficacy of treatment is contrived from a clinically meaningful decrease in both the frequency and severity of symptoms (Cuijpers, 2019). The Diagnostic and Statistical Manual-Fifth Edition (DSM-V) and International Classification of Diseases (ICD) classification systems chiefly coincide with this approach. While symptom alleviation is indeed crucial, other pertinent factors for treatment outcome need not to be forgotten. For example, individualized goals developed by the client (e.g., interpersonal conflict resolution, time management, exploring childhood upbringing, initiating employment) is another mechanism for operationalizing therapeutic change. Therapeutic outcome can also be conceptualized from a broader perspective. For instance, change can be defined from a multidimensional construct (e.g., quality of life), which integrates the physical, mental, and social aspects of health (WHOQOL, 1995). Consequently, operationalizing therapeutic outcome persists as an elusive task, but is essential to the development of instruments to measure such outcomes.

In general, the assessments used to measure treatment outcome are divided into two main forms, idiographic and nomothetic. The use of routine outcome monitoring (ROM) in psychotherapy has emerged as a prominent field of study over the last two decades (Lloyd, Duncan, & Cooper, 2019). Routine outcome monitoring intends to serve two essential roles: first, at the population level, as it can provide evidence on the outcomes of different services and

treatment to inform normative trends; and second, at the individual level, it aims to improve therapy progress and outcome through ongoing feedback provided by the client (Lloyd et al., 2019; Lambert et al., 2018).

Idiographic Measurement of Therapeutic Outcome

The ways in which therapeutic outcomes are measured has evolved over time. In the era of Freudian psychoanalysis and neo-psychoanalytic therapeutic approaches, client outcome was on the basis of the client's ability to gain insightful awareness into the origin and dynamic of unconscious conflicts. Such insight would ultimately seep down to the client's development of more adaptive patterns of affect and behavior that could generalize outside of the therapy room (Eagle & Wolitzky, 1992). The degree of change was contingent on the client's level of insight gained, to which outcome was measured by the therapist's subjective interpretation of the client's progress. Idiographic measurement is a personalized approach to match the needs of the client. Idiographic outcome measures are derived from individualized progress criteria, rather than global constructs. Notable idiographic measures of change include naturalistic observations, client self-monitoring of behaviors (e.g., diaries, activity records), and client-specific self-report rating scales (e.g., Subjective Units of Distress scale).

The dynamic systems of cognition, affect, and behavior are fundamentally idiographic, as these processes occur within the individual (Fisher, Newman, & Molenaar, 2011). Fisher and colleagues (2011) argue that therapy is also an inherently idiographic process, as the therapeutic direction and desired goals for change is at the discretion of the individual client. The idiographic measurement approach to treatment outcome encapsulates the client-specific goals that are of most value to the individual. This supports the notion that clients with the same diagnosis may vastly differ in their desired therapeutic goals (Lloyd, Duncan, & Cooper, 2019). Furthermore,

clients may feel a sense of empowerment and autonomy to promote change within themselves (Fisher et al., 2011).

Critics were dissatisfied with the precepts of psychoanalytic and neo-analytic frameworks, partly due to their philosophical underpinnings of measuring therapeutic outcome, which was largely based on the therapist's clinical judgment of subjectively measured change (Fishman & Franks, 1992). By studying this process researchers began to uncover specific components of psychotherapy (i.e., therapeutic alliance, interventions) that influence therapeutic outcomes (Strupp & Howard, 1992; Cuijpers, 2019). Extensive case studies allowed early psychologists to document patterns of an individual's behavior, thought, affect, and relationships as a function of the therapeutic intervention. These methods allowed the practice of psychotherapy to gain credibility and evidence for treating mental health conditions. However, due to a lack of adequate scientific research, critics cast skepticism on claims that psychotherapy was useful and efficacious (Eysenck, 1952).

Conversely, behaviorists hold a materialistic stance, emphasizing how observable behavior is influenced by environmental forces. The rise in behaviorism was dominated by well-known researchers, including Pavlov, Skinner, and Watson, who developed learning theory (i.e., classical and operant conditioning) and rigorously tested this theory through repeated and controlled animal experiments. An avid opposer of psychodynamic therapy, Eysenck developed behavior therapy with the hope of establishing a rational model to hypothesize and test interventions by means of observable and measurable behavioral change in humans. Behaviorism aided the field of psychology in establishing the study of human behavior as a true science by emphasizing objectivity, quantification of behavioral responses, and development of clear, causal, linear hypotheses to test questions about the nature of human behavior. Thus, through a

behaviorist lens, psychological phenomena are studied by examining antecedent environmental conditions and their consequential effects on human behavior (Fishman & Frank, 1992).

Currently, “behavior” is more broadly defined to include overt behaviors, as well as covert cognitive and affective processes that underly action (Fishman & Franks, 1992). Behavioral therapies focus on idiographic processes of change, where the individual serves as his or her own vehicle for change (Fisher et al., 2011). Behavior therapists evaluate a client’s baseline functioning to construct a clear overview of his or her presenting concerns to determine direct antecedents and consequences of the problem (Fisher et al., 2011; Beilack & Hersen, 1988). Behavioral interventions, whether it be insight-oriented, behavioral modification, cognitive reframing, or other interventions, are all individualized to meet the specific needs of the client (Arnkoff, Glass, & Shapiro, 2002). The use of idiographic measures by behavioral therapists allows for the opportunity to monitor behavioral change on an ongoing basis, as well as to modify interventions throughout the course of treatment. Thus, this client-centered approach appears to maximize the benefits related to treatment goal setting, monitoring, and outcome. Consequently, the advent of behaviorism established the importance of controlled experiments to test hypotheses on psychological phenomena and provided idiographic measurements of change that enable treatment to be tailored to the client’s needs.

Tschuschke et al. (2015) sought to investigate the association between factors (e.g., therapists’ theoretical framework, therapeutic alliance, clients’ severity of psychological problems) on client treatment outcome. This naturalistic study rated 262 audiotaped psychotherapy sessions on treatment adherence using a newly established rating manual. These sessions were randomly selected from 81 individual therapies representing eight different psychotherapy techniques. Scores were acquired at pre- and post to assess treatment progress as

measured by the Outcome Questionnaire (OQ-45.2). The findings demonstrate that, on the basis of the eight various therapeutic approaches, treatment adherence did not have a significant influence on treatment outcome. However, study results showed a significant relationship between the level of therapists' professional experience, clients' initial psychological distress reported, and treatment outcome. Furthermore, clients' severity of psychological issues at pre-assessment predicted the quality of the therapeutic alliance, whereas therapists' treatment adherence was predicted by therapists' professional experience and therapeutic alliance quality. These findings could suggest it is not adherence to a particular treatment modality per se, but rather the quality of the therapeutic alliance shared between the client and therapist. The strength of the therapeutic relationship may reflect the interaction of personality traits among both the client and therapist. The extent to which the client feels heard and understood by the therapist may therefore carry a greater weight on clients' treatment outcome, above and beyond treatment modality type (online versus in-person) and interventions used.

Nomothetic Measurement of Therapeutic Outcome

Implementation of RCTs, quasi-experimental designs, and meta-analyses strengthened the utility and credibility of psychotherapy as part of the social sciences field. As psychotherapy research gained momentum, nomothetic approaches to measuring aspects of therapeutic outcome emerged. Instruments now undergo rigorous statistical analyses to establish psychometric properties of reliability, validity, clinical utility, and sensitivity to change. Instruments assessing treatment outcome must demonstrate validity, meaning it clearly defines and measures the construct it intends to measure. To establish reliability, it must repeatedly and consistently measure its defined construct. Clinical utility refers to feasibility for clinicians to administer, score, and interpret the instrument as part of routine clinical practice to track treatment outcomes

(Ogles, 2013). The instrument must be sensitive enough to detect meaningful clinical change over time (Lutz et al., 2019).

The initial focus of clinical research studies is to demonstrate clinical efficacy of psychotherapy interventions. Clinical efficacy studies aim to answer the question: does the intervention work under experimental conditions? This question is answered by conducting RCTs that randomly assign participants to experimental and control conditions to test the effects of a specific, manualized intervention. Clinical efficacy is measured by examining the statistical significance of mean differences between experimental and control conditions. The goal of an RCT is to optimize internal validity, meaning researchers aim to confidently assert that the cause of any mean differences between groups is attributed to the effects of the intervention being tested as opposed to extraneous environmental factors or participant characteristics (Howard et al., 1996).

While RCTs maximize internal validity, they lack external validity and generalizability to real-world settings. Thus, the question of “does this intervention work in real-world clinical practice” is raised next and answered by conducting clinical effectiveness studies. These studies are conducted in naturalistic settings (i.e., mental health clinics) where clinicians are not required to follow a strict, manualized treatment protocol. Assignment of participants to comparison groups is non-random, where treatment and control groups often differ based on pre-treatment variables. These quasi-experimental studies aim to maximize external validity and generalizability of an intervention to various treatment settings. Like clinical efficacy studies, clinical effectiveness is measured by examining mean differences between experimental and control groups. However, results of such experiments are interpreted with caution as a variety of extraneous factors may account for outcomes aside from the intervention itself. Replication of

clinical effectiveness studies is often warranted to strengthen study findings (Howard et al., 1996).

Lastly, researchers and clinicians aim to assess whether an intervention is working at the individual level of the patient. In the age of evidence-based practice, routine outcome monitoring (ROM) with standardized self-report measures has become more widespread in assessing client progress toward treatment goals, as it allows for tracking of treatment outcomes on a session-by-session basis (Lutz et al., 2019; Lambert et al., 2001; Newham et al., 2010). The American Psychological Association (APA) recommends ROM be utilized in clinical settings as a part of psychological treatment due to research that demonstrates enhanced treatment outcomes. These instruments provide useful feedback for clinicians on how and when to modify treatment approaches and interventions (APA Presidential Task Force on Evidence-Based Treatment, 2006). ROM instruments must reliably measure clinically significant change, which is defined as change in patient functioning that is meaningful for individuals who undergo an intervention (Jacobson & Truax, 1991). Jacobson & Truax (1991) proposed two criteria that must be met to classify an outcome as “clinically significant.” First, a cutoff point must be established to distinguish between functional and nonfunctional. The second criterion is to ascertain that the change from pre-post treatment is reliable rather than simply due to measurement error. Criterion two is established by developing a Reliable Change Index (RCI) that each client must meet or surpass to demonstrate meaningful change. The RCI provides information about the magnitude of change a client has experienced as well as if they fall in the range of normal functioning on a given instrument (Jacobson & Truax, 1991).

Instruments assessing therapeutic outcome may be unidimensional or multidimensional in nature. Unidimensional instruments are disorder-specific, meaning they assess symptoms and

behaviors associated with a specific disorder (i.e., Generalized Anxiety Disorder-7, Beck Depression Inventory) while multidimensional measures assess a wider range of problems and are particularly useful for clients with comorbid diagnoses (Lutz et al., 2019; Hill & Lambert, 2004). For this reason, a multidimensional instrument will be utilized to assess treatment outcome in the present study.

Modern Approaches to Outcome Measurement

OQ 45

The Outcome Questionnaire 45 (OQ 45) is one such multidimensional measure designed to assess and track therapeutic outcome (Lambert et al., 2001; Lueger et al., 2001). As previously mentioned, defining therapeutic outcome is not solely based on symptom relief but extends more broadly to improved quality of life and enhanced functioning in different social roles (Strupp, 1964; Cuijpers, 2019). In alignment with this notion, the OQ measures three broad domains of functioning: symptoms of psychological distress, interpersonal problems, and social role functioning. These domains influence a client's overall quality of life (Lambert et al., 2001). The OQ is well-suited for assessing client distress levels and includes a Reliable Change Index (RCI) for determining the extent of client progress, or lack thereof, as well as a cutoff score for normal functioning. The OQ-45 has undergone extensive research demonstrating how it is effective in assessing therapeutic outcome and is useful in producing better outcomes compared to treatment conditions that do not employ an RCI and regular feedback to clinicians (Lambert et al., 2018; Ellsworth et al., 2006; Bovendeerd et al., 2022). While measuring therapeutic outcomes has become routine practice for mental health care providers, individual pre-treatment variables, such as client personality traits, carry implications for predicting treatment prognosis and outcome.

Rationale and Study Aims

The current literature suggests that teletherapy is as efficacious to in-person therapy on treatment outcome for a range of mental health disorders. Teletherapy further addresses barriers to in-person services previously remarked in the literature. Such benefits include greater accessibility, feasibility, and acceptability across populations (Burgoyne & Cohn, 2020). As demonstrated by the data, teletherapy and in-person services are comparable treatment modalities (Thomas et al., 2021; Acierno et al., 2016, 2017). Individual personality factors also show to effect outcome, yet not via teletherapy and nor the interaction between these factors. Numerous studies point to the correspondence of personality traits and susceptibility to mental health disorders (Malouff et al., 2005; Kotov et al., 2010). Introversion has associations with negative prognostic factors of poorer treatment outcomes and higher attrition rates in traditional therapy (Bucher et al., 2019; Tellegen et al., 1985). However, these findings have yet to be replicated via a teletherapy modality, with some sources suggesting no significant relationship between introversion and teletherapy on outcome. Although results have been found via teletherapy among adolescents, this has yet to be generalized to an adult population. Given the cited behavioral and psychological propensities underlying introversion, further examination of suitable treatment options, such as teletherapy, serves to meet individual client needs and therefore aims to achieve better treatment outcome. As teletherapy services grow in use, it is important to examine factors related to efficacy of teletherapy, the influence of introversion, and the interaction on treatment outcome. Therefore, the present study aims to expand the literature by comparing the personality trait of introversion to the therapy format on treatment outcome, to better address the underlying factors that influence clients' progress throughout therapy. The literature shows there is no significant difference in outcome between introversion versus

extraversion in therapy. Therefore, null findings for primary hypothesis 1.1 and primary hypothesis 1.2 are expected. However, the data suggests individuals with introversion are more prone to use technology formats (Zia & Malik, 2019) and thus, an interaction effect between introversion and teletherapy on outcome is expected.

The overall purpose of the present study aims to examine the effects of the personality trait introversion and therapy delivery modality (teletherapy and in-person) on treatment outcomes (assessed by OQ-45.2).

Chapter 2 Study Objectives and Hypotheses

The following study hypotheses and objectives are proposed:

Objective 1: To determine the association between introversion and treatment modality on treatment outcome.

Hypothesis 1.1: There will be no significant relationship between introversion scores (as measured by the MMPI-2 or MMPI-3 INTR scale T-score) and change in the OQ-45.2 score (OQ-45.2 T-score from beginning of treatment to end).

Hypothesis 1.2: There will be no significant relationship between teletherapy (0) services versus in-person (1) services on treatment outcome (OQ-45.2 T-score from beginning to end of treatment).

Hypothesis 1.3: There will a significant interaction effect between levels of introversion (MMPI-2 or MMPI-3 INTR T-score) and treatment modality (teletherapy versus in-person services) on treatment outcome (OQ-45.2 T-score from beginning to end of treatment).

Chapter 3 Methods and Procedures

Data Collection

This study utilized archival data and newly collected data from March 2020 through July 2022 from a community mental health training clinic in Melbourne, Florida. The training clinic is in affiliation with Florida Institute of Technology's clinical psychology doctoral program where 2nd and 3rd year student clinicians provide therapy while under close supervision of licensed clinical psychologists. Data was contrived from two electronic mental health records systems: Central Reach and Titanium. Teletherapy services were provided via Mend, a HIPAA-compliant telehealth platform that allowed for videoconferencing appointments. Participants' demographic information was collected from background information documented by student clinician's during their initial (baseline) consult, including gender and age of client. Additional relevant information gathered included introversion score obtained from the MMPI-2 or MMPI-3 INTR scale, treatment modality utilized (in-person or teletherapy), total number of sessions attended, and distress levels from two time-points: the initial intake (baseline) and termination (outcome). Participants who received the majority of their treatment (80 percent) via teletherapy or in-person were coded as part of that treatment modality.

Measures

MMPI-2 PSY-5 Scales

Structural validity of the PSY-5 scales was established by Bagby et al. (2002) through an item parceling approach. As such, items were placed into three groups: (1) random parcels, (2) parcels reminiscent of the PSY-5 scales, and (3) a single factor model in a clinical (N = 284) and nonclinical (N = 351) sample. Results indicated the structure of the PSY-5 scales were superior to the random parcel model and a single factor structure in both clinical and nonclinical samples

(Bagby et al., 2002). Bagby et al. (2002) thus concluded the PSY-5 scales demonstrate strong construct validity in measuring the intended personality constructs.

Furthermore, item response theory was used to determine whether the scales provided statistically descriptive information for low, mild, and high levels of each scale (Rouse et al., 1999). Rouse et al. (1999) concluded the INTR, DISC, and AGGR scales are clinically interpretable at both the high and low ends, while NEGE and PSYC provide little interpretative value at the mid and low ends of the scale (Rouse et al., 1999).

Rouse (2007) examined the reliability generalizability of the PSY-5 scales. He obtained 63 separate samples of PSY-5 data, which included 45 samples based on the MMPI-2 English version and 18 non-English translations. He found the alpha coefficients for the five scales ranged from .62 to .84 in the English version, while the non-English translations ranged from .60 to .82. The INTR scale received alpha coefficients of .77 in English and .72 in translation.

The PSY-5 scales also show construct validity with measures assessing personality disorders and psychopathy. Trull et al. (1995) found evidence of both convergent and discriminant validity with the PSY-5 scales and personality disorder symptoms, as assessed by the Personality Diagnostic Questionnaire (PDQ) and the Structured Interview for DSM-III-R Personality- Revised (Trull et al., 1995). Evidence of construct validity of the PSY-5 scales for both normal and pathological personality features has been demonstrated across numerous studies (Trull et al., 1995; Harkness et al., 1995; Harkness et al., 2002; Wygant et al., 2006). Trull et al. (1995) identified correlations between the PSY-5 INTR and NEGE scales and the NEO-PI-R extraversion and neuroticism scales ($r = .59$ and $.60$, respectively; Trull et al., 1995). Additionally, the PSY-5 scales were correlated with scales on Tellegan's Multidimensional Personality Questionnaire in a sample of college students, finding the INTR scores correlated -

.62 with MPQ Positive Emotionality (Harkness et al., 1995). Harkness et al. (2002) demonstrated construct validity with the PSY-5 scales and the 16-PF data in a sample of veterans from the Boston Veterans Administration. INTR scores most strongly correlated with the Happy-Go-Lucky Versus Somber scale at $r = -.43$. The PSY-5 scores have also been correlated with the Temperament and Character Inventory – Revised (TCI-R) scales based on a Spanish-speaking clinical sample. Gutierrez-Zotes et al. (2005) found the INTR scores were related to Harm Avoidance, Persistence, and Reward Dependence ($r = .66, -.59, \text{ and } -.51$, respectively). Thus, these studies show convergent validity for the PSY-5 scales with scales on other well-established personality measures.

Wygant et al. (2006) evaluated the incremental validity of the PSY-5 scales in predicting personality pathology over and above that of other MMPI-2 scales. Other studies (Bagby et al., 2008; Sellbom et al., 2005; Egger et al., 2003; Miller et al., 2004; Sellbom & Bagby, 2009; Ferrer-Auerbach et al., 2009) have replicated such findings, providing further support for the stability and robust clinical utility for the PSY-5 scales. Miller et al. (2004) demonstrated that personality traits distinguish between internalizing and externalizing presentations of posttraumatic stress disorder (PTSD) by comparing PSY-5 scores in a sample of veterans with internalizing and externalizing subtypes of PTSD to a low-pathology group. The internalizing sample endorsed higher scores on INTR, while individuals with externalizing features produced higher scores on PSYC, AGGR, and DISC (Miller et al., 2004). In a similar analysis performed by Sellbom and Bagby (2009) using a workplace trauma sample, individuals with the internalizing subtype endorsed higher scores on INTR and lower scores on AGGR, whereas individuals with externalizing features endorsed high scores on DISC.

MMPI-2-RF PSY-5 Scales

The MMPI-2-Restructured Form (MMPI-2-RF) contains 338 items from the original 567 items on the MMPI-2. Out of the 136 items from the MMPI-2 that comprised the PSY-5 scales, 96 were retained on the MMPI-2-RF. Additionally, Harkness and McNulty refined retained test items and developed new items reflective of each scale construct. The MMPI-2-RF PSY-5 (PSY-5-r) scales contain a total of 104 items and demonstrate psychometric properties comparable to the MMPI-2. The INTR-r scale contains 20 items, 4 new and 16 retained from the INTR scale on the MMPI-2. The INTR-r scale is highly correlated with the original NEGE scale, $r = .86$ (Harkness et al., 2014; Ben-Porath & Tellegen, 2008). Such a correlational demonstrates collinearity between the INTR and INTR-r scales, suggesting construct equivalence. Internal consistency values with Cronbach's alpha ranged from .69 to .78- and one-week test-retest reliability on the MMPI-2-RF normative sample yielded values ranging from .69 to .78. The INTR-r scale demonstrates strong psychometric properties and measure the same construct as the original MMPI-2 PSY-5 scales. High INTR scorers are associated with low hedonic capacity, social withdrawal, and feel disengaged. Low INTR scorers are associated with social engagement, gregariousness, warmth, and present as socially attractive. Specifically, INTR-r scores are correlated with NEO-PI-R Extraversion and MPQ Positive Emotionality scores. INTR-r score are associated being described as depressed, as struggling with clinical problems of depression and suicide, anhedonia, decreased energy, and feeling hopeless/helpless (Ben-Porath & Tellegen, 2008).

MMPI-3 PSY-5 Scale

The MMPI-3 is the most recent version of the MMPI instruments. The goals for the MMPI-3 include updating the measure and mitigating previous concerns that were not otherwise

addressed in previous revisions, of which entails adding new items to fine-tune assessment areas of psychopathology. The MMPI-3 normative sample contains 1,620 individuals and represents the 2020 US census population. It contains 335 items with a total of 52 scales and was developed from the MMPI-2-RF-Extended Version (MMPI-2-RF-EX). The MMPI-2-RF-EX contains the original 338 items that comprise the MMPI-2-RF and 95 new trial items. To determine psychometric equivalency between the MMPI-3 and the MMPI-2-RF-EX, 164 undergraduate student participants were administered both versions of the tests. Regarding the PSY-5 INTR scale, there was no significant difference between mean scores on the two versions. Cronbach alpha values were $r = .82$ and $.83$ for the MMPI-3 and MMPI-2-RF-EX, representing good internal consistency for both versions. Additionally, no differences were found for one-week test-retest reliability across the two measures, $r = .88$.

PSY-5 scale of Introversion/Low Positive Emotionality (INTR)

From a clinical perspective, high INTR scores may indicate depressive isolation, schizoid-like presentation of disengagement, or both, contingent on the individual's distinctive pattern of items endorsed (Harkness & McNulty, 2006). On the other end of the scale, low INTR scorers present as socially engaged, outgoing, warm, and socially attractive. Moreover, a low INTR score is characterized by gregariousness, friendly and easygoing interactions with others, notable pleasure in social interactions, self-confidence, and assertiveness (Harkness & McNulty, 2006).

The PSY-5 scale of Introversion/Low Positive Emotionality (INTR) measures hedonic capacity, level of social engagement, and the capacity to experience pleasure (Harkness et al., 1995; Graham 1990) The MMPI-2 PSY-5 INTR scale is a 34-item measure that includes 5 True and 29 False statements designed to reflect the underpinning traits that encompass introversion.

INTR is categorized as a “bipolar scale” on the MMPI, given its clinical interpretability with both high and low scores. For instance, INTR is considered clinically elevated with a T-score of > 65, while a subclinical level of INTR is interpretable with a cutoff T-score of 60-64. On the other end of the scale, T-scores of < 40 are considered low scores.

High INTR scores are associated with low hedonic capacity, social withdrawal, under involved or disengaged (Harkness et al., 1995; Graham, 1990). Distinct characteristic features of high scores include anhedonia, discontentment, low energy, low self-esteem, and a propensity to resign prematurely in the face of challenges. Additionally, individuals with high INTR scores are described as feeling uncomfortable around others, tend to avoid social situations, have distant relations with others, and react impassively when social interactions are unavoidable (Bucher et al., 2019; Graham, 1990). In Meehl’s extensive research in personality pathology, he postulates that a “deflective pleasure parameter” (i.e., anhedonia; Meehl, 1976), may be the foundational basis of a high scorer’s limited emotional responsiveness.

Multicollinearity between MMPI-2 and MMPI-3.

To current date, there is limited data on the correlate matrix between the MMPI-2 INTR scale and MMPI-3 INTR scale. One study does examine the comparability of the MMPI-3 and MMPI-RF-EX. In one such study, Hall and colleagues (2022) evaluated the comparability of MMPI-3 to MMPI-RF-EX with a sample of 192 college students who completed both the MMPI-2-RF-EX and MMPI-3 one week apart. Paired-sample *t*-tests were conducted to investigate the comparability of mean scores across both versions. The results indicated there were no statistically significant differences across the PSY-5 scales on both versions, with α values ranging from .60 (PSYC) to .90 (NEGE) (Hall, Menton, & Ben-Porath, 2022). The results

can be found in Table 1 (Hall, Menton, & Ben-Porath, 2022) for the INTR scale across both versions.

Although these findings do not directly address the inter-correlation between the two versions, it is suggestive of collinearity. This has empirical utility as it shows consistent variance, and very small changes across versions, but falls short of intercorrelating the variables. Study findings provide solid evidence that there is shared variance between both versions (the MMPI-2-RF-EX and the MMPI-3 INTR scales). Since these versions provide strong empirical evidence and shared variance, it is likely the MMPI-2 and the MMPI-3 INTR scales may also demonstrate multicollinearity. Exploratory analyses will be discussed in detail below regarding the present study's findings regarding the multicollinearity between both versions to address this gap in literature.

OQ-45.2

The Outcome Questionnaire 45.2 (abbreviated to OQ) is a 45-item self-report measure designed to assess the efficacy of clinical interventions of clients undergoing therapy. It provides a Total Score as well as three subscale scores: Symptom Distress (25 items), Interpersonal Relations (11 items), and Social Role Functioning (9 items). The Symptom Distress scale measures subjective discomfort mostly in the form of depression, anxiety, and substance use. The Interpersonal Relations scale measures problems in one's interpersonal relationships while the Social Role Functioning scale measures dissatisfaction, conflict, and distress across domains including employment, family, school, and leisure. The measure also contains critical items to alert clinicians to clients endorsing suicidal ideation, workplace violence, and substance abuse (Lambert et al., 1994). Clients rate each item on a 5-point Likert scale ranging from 0 (Never) to 4 (Almost Always). The OQ is scored by summing items together (nine items are reverse scored)

to yield scores on each subscale as well as the Total Score. Higher scores indicate greater levels of psychological distress. Scores range from Low (< 64), Moderate (64-82), Moderately High (83-105), and High (>105). Clinically significant change is defined by change in patient functioning that is meaningful for individuals who undergo an intervention. Jacobson & Truax (1991) proposed two criteria that must be met to classify an outcome as “clinically significant.” First, a cutoff point must be established to distinguish between functional and nonfunctional. For the OQ, this was established by calculating the weighted midpoint between the means of the clinical and nonclinical samples which yielded a clinical cutoff score of 63. The mean OQ score for the outpatient sample was 83.09 ($SD = 22.23$) while the mean score for the community sample was 45.19 ($SD = 18.57$). The second criteria proposed by Jacobson and Truax (1991) is to determine that the change from pre-post treatment is reliable rather than simply due to measurement error. Criteria two is established by developing a Reliable Change Index (RCI) that each client must meet or surpass to demonstrate meaningful change. The OQ has an RCI that categorizes individuals as “Recovered,” “Improved,” “No change,” and “Deteriorated.”

The OQ normative sample included $N = 815$ community members across various geographical locations of the United States, $N = 583$ undergraduate students from the Midwest, $N = 441$ individuals receiving clinical services from an Employee Assistance Program (EAP), $N = 486$ clients from university counseling centers, $N = 342$ outpatient clients, and $N = 207$ inpatient clients. Client ages ranged from 17 to 80. No significant differences in OQ scores were found between genders. The measure has good internal consistency with a Cronbach alpha value of .93 for both the EAP patient sample and undergraduate student sample and 3-week test-retest reliability of $r = .84$ for the student sample (Lambert et al., 1996). Criterion validity was established by administering the OQ and a variety of other measures to the following samples:

university counseling center (N = 53), outpatient (N = 106), and inpatient (N = 24). Pearson product-moment correlations were as follows: Symptom Checklist 90R ($r = .78 - .88$), Social Adjustment Rating Scale ($r = .66 - .81$), and the Inventory of Interpersonal Problems ($r = .71 - .8$). Criterion validity was also demonstrated with the university counseling center for several other measures, including the Beck Depression Inventory ($r = .80$), Zung Self-Rating Depression Scale ($r = .88$), Zung Self-Rating Anxiety Scale ($r = .81$), Taylor Manifest Anxiety Scale ($r = .86$), and Social Adjustment Scale ($r = .44$).

The OQ also underwent studies to determine its ability to detect reliable change in clients undergoing therapy and demonstrate stability in scores of individuals who are not in treatment. Fifty-six undergraduate students were administered the OQ weekly for ten weeks to assess for stability across scores which yielded adequate consistency across scores, with reliability decreasing overly weekly administrations (Week 1 to Week 2, $r = .86$; Week 1 to Week 10, $r = .66$). Sensitivity to change was further tested with a sample of 40 therapist patients at a university counseling center. Participants were administered the OQ at intake and after the seventh session to assess for significant change in psychological distress. Results revealed significant changes in mean scores ($p < .05$), demonstrating the OQ's ability to assess change over time for individuals in treatment. Further research was conducted to support the sensitivity and specificity of the OQ. A clinical sample (N = 5,552) of university counseling clients and a nonclinical control group (N = 248) were administered the OQ on a weekly basis over the course of nine weeks. Results revealed significant a mean difference ($p < .001$) in change between the clinical and nonclinical sample in the expected direction and a medium effect size measured by Cohen's $d = .59$. That is, the clinical sample experienced a significant decline in OQ score compared to the nonclinical sample (Vermeersch et al., 2004).

Research has also been conducted to establish the OQ's sensitivity and specificity to pathology. The OQ was administered to two clinical groups (EAP and outpatient) and two nonclinical groups (community and undergraduate). Results yielded an 84 percent sensitivity rate meaning it can correctly classify individuals into the dysfunctional range (Total Score > 63) 84 percent of the time. Its specificity rate is 83 percent, meaning it correctly classifies individuals in the functional range (Total Score < 64) 83% of the time.

Comparability of OQ-45.2 T-scores between pre-COVID-19 and during COVID-19:

Several studies have examined the differences in distress level scores between pre-pandemic, during the pandemic, and post-pandemic timepoints. Cerutti et al (2022) found significant differences in initial distress level scores between pre-pandemic and during the pandemic timepoints, while Erekson et al. (2021) found no significant differences from pre to during the pandemic timepoints. Other study findings yielded significantly higher distress levels after the pandemic (Savage et al., 2020; Sankhi, 2020; Rocha et al., 2020). The present study seeks to examine initial distress scores at the start of the pandemic compared to distress levels post-pandemic.

Procedures

Data from participants were obtained from HIPAA compliant electronic health records systems, Central Reach and Titanium from a community mental health training clinic. Participant data was collected if they participated in teletherapy or in-person services and produced a valid MMPI-2 or MMPI-3 protocol. Demographic information was collected from reports obtained at the time of intake for each participant. This includes the individual's age, gender, and race/ethnicity. Participant termination summaries were examined to collect data on number of sessions attended, and OQ-45.2 score at the time of intake and termination. Introversion scores

were collected from MMPI-2 and MMPI-3 score reports generated by Q-Global and uploaded to the participant's chart in Central Reach or Titanium. Inclusion criteria included individuals being 18 years or older, attending at least three therapy sessions, and completing the Minnesota Multiphasic Personality Inventory -2nd / 3rd edition (MMPI-2; MMPI-3). Exclusion criteria from this study are individuals who produced an invalid personality profile.

Data Analytic Strategy

All participant data were assigned a de-identified code and entered into IBM Statistical Package for the Social Science (SPSS). Descriptive and inferential were obtained via statistical analyses. Preliminary analyses were conducted to examine data for homogeneity, linearity, and normality of data distribution. Outliers and skewedness of data were assessed via visual inspection. Simple linear regressions, independent samples *t*-tests, Pearson product moment correlations, and paired samples *t*-tests were conducted to examine primary and exploratory analyses.

Participants

A total of 56 patients between March 2021 to July 2022 were administered the MMPI-2 or MMPI-3 assessment, the OQ-45.2 at initial and final session timepoints, aged 18 years or older, and attended at least 80% of therapy sessions either via teletherapy or in-person. Participants who produced an invalid MMPI profile, attended less than 3 therapy sessions in either treatment modality group, and did not complete an OQ-45.2 instrument at baseline and termination, were excluded from the present study. Out of these patients, 2 patients did not meet inclusion criteria per visual inspection of Histogram distribution data graphs. After removing individuals who did not meet the criteria for inclusion, a total of 54 participants were included in the current study. Among them, 29 patients (53.7%) attended treatment services via teletherapy,

while 25 patients (46.3%) attended in-person treatment services. Participants were predominantly White/Caucasian ($n = 39, 72.2\%$), female ($n = 31, 57.4\%$), and were on average 38.35 ($SD = 14.28$) years of age. Participants attended an average of 16.22 ($SD = 12.06$) therapy sessions. See Table 2 for additional demographic information.

54 INTR scores were obtained equally from each MMPI version, MMPI-2 INTR ($M = 63.11, SD = 18.40$) and MMPI-3 INTR ($M = 61.30, SD = 14.37$). Overall average INTR scores were 62.20 ($SD = 16.37$). See Table 3 for means and standard deviations, of variables.

Treatment outcome ($M = 13.90, SD = 19.82$), as measured by the OQ-45.2 was obtained by subtracting participants' baseline score from their score at the time of termination. Initial outcome (OQ-45) scores were on average $M = 78.70 (SD = 24.87)$ and final (OQ-45) treatment outcome scores were on average $M = 63.81 (SD = 28.35)$. Among the in-person treatment group, initial OQ-45 scores were on average $M = 77.16 (SD = 28.12)$, with a final OQ-45 average score of $M = 68.60 (SD = 27.64)$, and treatment outcome average score of $M = 8.56 (SD = 18.59)$. Within the teletherapy treatment modality, mean and standard deviations were as follows: Initial OQ-45 ($M = 78.17, SD = 22.20$), Final OQ-45 ($M = 59.70, SD = 28.78$), and treatment outcome ($M = 18.48, SD = 19.90$). See Table 3 for means and standard deviations of variables.

Chapter 4 Results

Hypothesis 1.1: There will be no significant relationship between introversion scores (as measured by the MMPI-2 or MMPI-3 INTR scale T-score) and change in the OQ-45.2 score (OQ-45.2 T-score from beginning of treatment to end).

Hypothesis 1.1 was analyzed using a simple regression analysis to determine the main effect between introversion scores (MMPI-2 or MMPI-3 INTR T-score) and treatment outcome (OQ-45.2 T-score from beginning to end of treatment). There was homoscedasticity and normality of the residuals as assessed by visual inspection of a normal probability plot. The simple regression model was not significant, $b = -.09$, $F(1, 52) = .29$, $p = .592$. Introversion scores did not predict treatment outcome. The overall regression model can be found in Table 4.

Hypothesis 1.2: There will be no significant relationship between teletherapy (0) services versus in-person (1) services on treatment outcome (OQ-45.2 T-score from beginning to end of treatment).

An independent-samples t -test was conducted to determine the main effect of treatment delivery modality (teletherapy coded: 0; in-person coded: 1) on treatment outcome (OQ-45.2 T-score from beginning to end of treatment). There were no outliers in the data, as assessed by inspection of a boxplot. Treatment outcome scores were normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$). Levene's test suggested that variances in treatment outcome for in-person and teletherapy modalities were statistically equivalent, $F(52) = .21$, $p = .649$. Results from 54 participants (Teletherapy 29, In-person 25) showed that there is no statistically significant difference between teletherapy and in-person modalities on treatment outcome scores ($M = 13.90$, $SD = 19.82$), $t(52) = 1.88$, $p = .066$. See Table 5 for means, standard deviations, and t -test summary.

Hypothesis 1.3: There will be a significant interaction effect between levels of introversion (MMPI-2 or MMPI-3 INTR T-score) and treatment modality (teletherapy versus in-person services) on treatment outcome (OQ-45.2 T-score from beginning to end of treatment).

To test Hypothesis 1.3, a simple regression analysis was conducted to examine the relationship between treatment modality (0,1) and introversion scores (MMPI-2 or MMPI-3 INTR T-score) on treatment outcome (OQ-45.2 T-score).

INTR ($b = -.09, p = .549$) and treatment delivery modality ($b = -10.01, p = .065$) did not significantly predict treatment outcome scores ($R^2 = .07, F(2, 53) = 1.92, p = .156$). Changes in treatment outcome score is not significantly predicted by INTR scores, treatment delivery modality, nor the interaction of INTR and treatment delivery modality on treatment outcome, failing to support hypothesis 1.3. Instead, the null hypothesis 1.3 is retained. The overall model can be found in Table 6.

Exploratory Analyses

Exploratory analyses were conducted through Pearson's product-moment correlation to assess the relationship between variables, including INTR, initial OQ-45, final OQ-45, treatment outcome, treatment modality, and number of sessions attended. Further statistical analyses were conducted for significant findings. See Table 7 for means, standard deviations, and correlations of variables.

Results show that the INTR score significantly predicted the initial OQ-45 score, $b = .52, t(53) = 2.61, p = .012$. The INTR score explained a significant proportion of the variance in the initial OQ-45 score, $R^2 = .12, F(1,53) = 6.83, p = .012$. 12% of the variance in the initial OQ-45 score was accounted for by the INTR score. Introversion and initial treatment outcome scores

had a moderate positive correlation, $r(52) = .34, p = .012$ (two-tailed). See Table 8 for summary of regression model. See Figure 1 for scatterplot graph.

A paired samples t -test was used to determine if participants pre- to post- treatment outcome scores changed from initial to final OQ-45 scores. Results from 54 individuals showed that participant's average score on the OQ-45 after attending treatment services ($M = 63.81, SD = 28.35$) changed significantly from their initial therapy session ($M = 77.70, SD = 24.87$), $t(53) = 5.15, p < .001$ (two-tailed). The mean change is 13.99 ($SD = 19.82$), with a 95% CI [8.48, 19.30], and reflects a medium effect size with Cohen's $d = .70$. See Table 9 for means, standard deviations, and relationship summary between variables.

Secondary objectives and hypotheses being explored are as follows:

Objective 1: To determine the multicollinearity between the MMPI-2 and MMPI-3 INTR scale versions.

Hypothesis 1: There will be no significant difference between the MMPI-2 INTR scale and the MMPI-3 INTR scale

An independent samples t -test was conducted to examine INTR scores between MMPI versions. MMPI-2 ($M = 63.11, SD = 18.40$) and MMPI-3 ($M = 61.30, SD = 14.37$) INTR scores elicited equality of variances as assessed by Levene's Test for equality of variances $F(52) = 1.15, p = .289$). Results from 54 participants (MMPI-2 27, MMPI-3 27) indicated that there was no statistically significant difference between MMPI versions on INTR scores, $t(52) = .40, p = .688$. See Table 10 for means, standard deviations, and t -test analysis summary.

Objective 2: To determine the association between baseline OQ-45.2 scores at two timepoints.

Hypothesis 2: Hypothesis 2 will determine if patients' initial distress during the pandemic will be different than patients' initial distress post pandemic.

There will be a main effect between baseline OQ-45.2 scores during the pandemic and post-pandemic (OQ-45.2 baseline T-scores). Participants in the teletherapy group were identified as during the pandemic, while participants in the in-person treatment group were identified as the post-pandemic timepoint.

Hypothesis 2 was tested using an independent samples *t*-test to determine if OQ-45.2 baseline scores at the start of the pandemic versus post-pandemic achieved significantly different initial outcome scores (OQ-45.2 baseline T-score). Assumption tests indicated that there were no outliers in the initial OQ-45 scores for the start of the pandemic and post-pandemic, and initial OQ-45 scores were normally distributed. Levene's test suggested that variances in initial OQ-45 scores for both groups were statistically equivalent, $F(52) = 1.10, p = .299$. Results from 54 participants (During pandemic 29, Post-pandemic 25) showed that there was no statistically significant difference between during the pandemic ($M = 78.17, SD = 22.20$) and post-pandemic ($M = 77.16, SD = 28.12$) timepoints on initial OQ-45 scores, $t(52) = -.15, p = .883$. See Table 11 for means, standard deviations, and *t*-test analysis summary.

Chapter 5 Discussion

The current study examined multiple predictors of treatment outcome, including the personality trait introversion, treatment delivery modality (teletherapy and in-person), and a range of demographic variables. At present, the available literature on the relationship between introversion and treatment modality on therapeutic change is limited despite the multitude of studies suggesting the prominent role introversion has on mental health difficulties, premature client attrition rates, and higher distress levels (Roy, 1998; Bucher et al., 2019; Shokrkon & Nicoladis, 2021). Additionally, the current literature shows teletherapy services are comparable to in-person treatment services in treating mental health disorders (Thomas et al., 2021; Acierno et al., 2016, 2017) in addition to adaptations of therapeutic interventions to a virtual platform (Thomas et al., 2021). Teletherapy has become increasingly utilized by both practitioners and individuals seeking treatment services (Lin et al., 2021). There was a notable spike in teletherapy usage during the COVID-19 pandemic and subsequent shelter-in-place mandates as in-person treatment services were largely restricted per CDC guidelines (Pierce et al., 2021; Glueckauf et al., 2018). Despite pandemic restrictions that have since been lifted, teletherapy remains as part of mental health standard practice (Gangamma et al., 2022). The present study findings have salient clinical implications, with both significant and nonsignificant findings providing robust utility for the field of psychology.

Hypothesis 1.1 sought to examine if introversion predicted changes in treatment outcome scores. Statistical analyses revealed introversion did not predict changes in treatment outcome, supporting hypothesis 1.1. This finding suggests higher introversion scores are not indicative of treatment prognosis. Existing literature show mixed findings, with sources suggesting higher levels of introversion are associated with poorer treatment outcomes (Bucher et al., 2019;

Tellegen et al., 1985), while Sloane et al. (1976) found no significant association between introversion and treatment outcome. Thus, the present study's findings are more reflective of broader real-world trends, in which individuals mirror the multi-dimensional trait theory of personality functioning. The present results support foundational research based on trait theory and the Five Factor Model (FFM), which suggest introversion is multi-dimensional; individuals possess different sub-facet traits of varying degrees (McCrae & Costa, 1990). Costa and McCrae (1988) indicated the majority of people fall somewhere in the middle of each trait dimension, with 38% of the population falling in the "average" range of a given trait. The introversion-extraversion dimension is no exception to the normal distribution bell curve. That is, most individuals exhibit a degree of both introversion and extroversion sub traits. The bell curve distribution is supported in the study findings, which showed an average MMPI INTR score of 62.20 ($SD = 16.37$) among the total participants. Therefore, the notion that participants possess sub traits containing both sides of the introversion-extraversion spectrum is underscored in the study findings.

Hypothesis 1.2 postulated that changes in treatment outcome would not be significantly different between treatment delivery modalities (in-person versus teletherapy). This hypothesis was supported in that participants who received therapy via teletherapy produced comparable changes in treatment outcome to the in-person treatment group. The relatively similar OQ-45 scores across treatment modalities support previous literature, providing further evidence of the efficacy and effectiveness of teletherapy services. Study findings contribute to previous studies suggesting teletherapy and in-person services show comparable therapeutic change (Thomas et al., 2021; Acierno et al., 2016, 2017). Teletherapy is therefore a suitable and viable option for therapy services, especially with the cited benefits of extending treatment services to rural and

hard-to-reach populations. It also offers greater feasibility, accessibility, and acceptability (Burgoyne & Cohn, 2020; Marques et al., 2010; Mohr et al., 2008). This finding contributes to the robust literature indicating teletherapy as a suitable treatment modality.

In reference to hypothesis 1.3, an interaction effect between introversion and treatment modality on treatment outcome was not found. Levels of introversion and in-person versus teletherapy were not associated with changes in treatment outcome scores. Similar findings are seen in previous studies that showed individuals with higher levels of introversion receiving teletherapy produced comparable therapeutic progress to face-to-face therapy. For instance, Zainudin et al. (2019) conducted a study utilizing an adolescent sample, which beckoned the question of generalizability to an adult population. Since adolescence is a stage of identity development, personality traits may not be fully developed. The present study sought to extend these findings to an adult population. Zainudin et al. (2019) found no significant relationship between introversion and treatment modality on treatment outcome. Their study findings did however suggest that client satisfaction between modalities were more attributable to factors such as the quality of the therapeutic relationship, feasibility and accessibility to therapy, and comfort with technology. Comparatively, Kofmehl (20117) suggested that age and level of comfort with technology were more predictive of teletherapy use and treatment progress above and beyond high levels of introversion. Additionally, existing literature suggest introverts prefer a tele-based communication style, while extraverts prefer face-to-face communication (Zia & Malik, 2019). Consequently, the present study findings suggest that higher introversion scores produce similar therapeutic improvement regardless of modality.

Statistical analyses sought to investigate the difference in treatment outcome scores from baseline to final timepoints. On average, OQ-45 scores decreased by 13.99 points ($SD = 19.82$)

from initial ($M = 77.70$, $SD = 24.87$) to final ($M = 63.81$, $SD = 28.35$) timepoints. Findings indicate significant improvement on overall psychological distress. Overall, therapy treatment produced some degree of favorable outcomes for participants. The present finding is strongly supported in empirical studies; psychotherapy is efficacious and effective (Hubble et al., 1999; Duncan et al., 2010). The American Psychological Association (APA) further suggest that about 75% of people who engage in psychotherapy show some benefit. Additionally, for people who attend psychotherapy, 80% are better off than those who do not enter treatment (American Psychological Association [APA], 2022). The present findings reflect the multidimensional construct of therapeutic change (WHOQOL, 1995). That is, what deems “therapeutic change” is rooted in client-specific, individualized treatment goals. Contrarily, the OQ-45.2 is a nomothetic measure and a difference of 14 or more points from pre to post treatment is indicative of clinically significant change (Lambert et al., 2001). In the present study, 26 participants (48%) met criteria for clinically significant change in overall psychological distress.

Results further indicate a significant positive correlation between introversion and baseline OQ-45 scores. This finding suggests that higher introversion scores are associated with higher initial distress . This is commensurate with previous research that explored the relationship between personality traits and psychological distress levels. In particular, several studies have found that higher levels of introversion are indicative of poorer mental health, higher attrition rates, general maladjustment, psychological distress, and poorer treatment outcome (Lucas & Dyrenforth, 2008; Jylhä et al., 2009; Fadda & Scalas, 2016). Additionally, people who score higher on introversion tend to feel uncomfortable in social situations, are less likely to seek social support, and are less inclined to express painful emotions. They also often demonstrate the propensity to avoid vulnerable emotional states which, coupled with a

disinclination to seek help, may contribute to an augmented internal discomfort. This is likely to result in higher initial distress upon beginning treatment. Conversely, extraverted individuals typically demonstrate help seeking behaviors and feel more at ease in vulnerable states (Lysaker et al., 2004). Beauchamp et al. (2011) further postulated that extraverts may engage in treatment more effectively than introverts due to their help-seeking tendencies. As such, the present study findings are consistent with prior literature which attributes initial distress levels to underlying sub traits associated with introversion and extraversion.

Exploratory analyses were conducted to examine the collinearity of INTR scores between the MMPI-2 and MMPI-3. Findings indicated that INTR scores on the different versions are not significantly different, as both versions yielded similar mean scores (MMPI-2 $M = 63.11$, MMPI-3 $M = 61.30$). This result demonstrates a linear association between INTR scores which suggests the scales measure a similar construct of introversion. Comparatively, Hall et al. (2022) examined the inter-correlation between the MMPI-2-RF-EX and the MMPI-3. Their study provided strong empirical evidence regarding the shared variance between the MMPI INTR scale versions. As previously discussed, the MMPI-2-RF-EX is derived from the MMPI-2 and demonstrates shared variance between versions. Additionally, the MMPI-2-RF-EX item pool was used to develop the MMPI-3 items. As the MMPI-3 released in 2020, there remains a dearth in the literature surrounding the collinearity with previous MMPI versions. Findings from the present study thus serve to build upon the scant literature as results provide a basis for comparison among the INTR scale MMPI-2 and MMPI-3. One potential limitation to this finding is that the present study utilized a between-subjects design. Future studies would benefit from conducting a within-subjects study design to identify collinearity between MMPI versions.

The present study also investigated differences in initial distress levels between two timepoints: 1) the start of the pandemic and 2) post-pandemic. Initial distress was hypothesized to be higher during the pandemic as opposed to post-pandemic. Statistical analysis indicated no significant difference in initial OQ-45 scores between timepoints, failing to confirm the study's hypothesis. That is, baseline scores showed similar distress levels during the pandemic and after the pandemic. There are mixed results in the current literature regarding the present study's findings. For instance, Cerutti et al. (2022) sought to examine differences in clinical symptoms and overall psychological distress comparing two groups of students at a University Psychological Counseling Center: 1) Before the pandemic (n = 115) and 2) during the pandemic (n = 72). Psychological distress was assessed by the OQ-45.2, the Symptom Checklist-90-Revised was used to monitor clinical symptoms, and personality traits were measured by the Personality Inventory-Brief Form for DSM-5. Cerutti et al. (2022) found that participants endorsed higher levels of clinical symptoms (e.g., depression, anxiety) during the pandemic than the pre-pandemic group. However, results yielded no significant difference in psychological distress between both groups. This finding is contraindicated in the literature, with some studies demonstrating higher levels of psychological distress and decreased mental and physical well-being after the pandemic (Savage et al., 2020; Sankhi, 2020; Rocha et al., 2020). In contrast, Erekson et al. (2021) demonstrated that OQ-45.2 scores had no significant difference in psychological distress levels among students attending treatment services during the pandemic, and those who attended 3 years prior. Erekson et al.'s (2021) produced similar results to that of the present study. For this reason, more expansive research is warranted to identify if there are extraneous variables surrounding the contraindicated findings in the current literature.

Limitations and Areas for Future Research

The current study has several limitations. There is a surprising lack of research on the multicollinearity between versions (i.e., MMPI-2 and MMPI-3 INTR scale), resulting in moving forward with the present study without a priori knowledge. The present study sought to establish multicollinearity between MMPI versions. Although findings revealed INTR scores between versions were significantly similar, empirical collinearity could not be provided due to the nature of a between-subjects study design. However, this limitation appears to be a fundamental weakness in the body of literature, rather than specific to this study. Future studies would benefit from utilizing a within-subjects study design to establish collinearity between the MMPI-2 and MMPI-3 scales.

Given that the current study used archival data obtained between a wide range of dates (i.e., March 2020 through July 2022), this curtailed the opportunity to account for environmental factors that may impact treatment outcomes. Future studies could account for this by replicating and expanding the findings by conducting an RCT or interventional study.

Another drawback of the current study is the pandemic as a confounding variable, which may have had implications when comparing participants who received treatment services during and after the COVID-19 shelter-in-place mandates. Future studies could focus on examining the effects of teletherapy versus in-person services on treatment outcome simultaneously to ensure a more accurate evaluation of the two treatment modalities. The lack of control over the type and duration of treatment each participant received is another limitation of the current study.

However, the characteristics of this study may have considerable implications at the broad, real-world level.

Future research directions could also examine the interaction of multiple personality traits and their inter-effects on each other, as the current study solely focused on the trait of introversion. Consequently, the present study does not fully depict the complex and intricate nature of personality structure since only one trait was emphasized.

Another limitation regards the relatively small sample sizes for treatment modalities (teletherapy $n= 29$, in-person $n= 25$) and is somewhat lacking in diversity, with the majority of participants identifying as White/Caucasian ($n = 39, 72.2%$) and female ($n = 31, 57.4%$). These constraints may inadvertently compromise the generalizability of study findings to diverse populations. Future research should therefore aim to include larger sample sizes in addition to a greater representation of various race/ethnicity backgrounds.

Conclusion

The present study found that teletherapy is as efficacious to in-person on therapeutic change, which is commensurate with previous research findings. Teletherapy addresses barriers to traditional in-person therapy and is especially beneficial for providing therapy services to underserved and remote populations. For this reason, student clinicians would benefit from telehealth training integrated into graduate-level clinical programs. Implementing specific courses that address empirically supported telehealth-based clinical applications may further increase clinicians' competencies.

Treatment progress and outcome appear to be no more or less compromised by individuals with higher levels of introversion, nor by the therapy modality. In correspondence with research suggesting introverts prefer tele-mediated communications, therapeutic progress is without the contingencies of treatment modality. Other pre-treatment factors may be of greater

influence on therapeutic progress that supersede the introversion-extraversion trait. Furthermore, study findings suggest higher levels of introversion is related to higher initial distress levels at the start of therapy. However, treatment progress does not appear to be hindered for those who exhibit more introverted traits, a finding that may have clinical utility for providers. For instance, this underscores the benefits of personality assessment testing, which can inform treatment planning, aid in diagnostic impressions, and assist in client-specific treatment goals. For this population, early rapport building is critical to secure a strong therapeutic alliance before implementing therapeutic interventions that may prematurely and inadvertently raise distress levels. Additionally, administering routine outcome measures can provide clinicians insight on treatment progress and serve as a vital tool for continued client conceptualization. The present study findings demonstrate promising contributions to the field of psychology with notable implications for clinical utility. This research contributes to the growing body of literature supporting teletherapy use as an empirically sound alternative to traditional in-person therapy.

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Appendix A: Measures

Due to copyright reasons, the MMPI-2/MMPI-3 and OQ-45.2 measures cannot be included.

Appendix B: Figures and Tables

Table 1

Comparisons of Scores Derived From the MMPI-3 and the MMPI-2-RF-EX

Scale	MMPI-3		MMPI-2-RF-EX		Mean score comparisons				r_{cv}
	M	SD	M	SD	Δ	t	p	d	
INTR	51.2	11.7	51.1	11.5	0.1	0.34	.74	.01	.99

Note. Adapted from “Examining the psychometric equivalency of MMPI-3 scale scores derived from the MMPI-3 and the MMPI-2-RF-EX”, by Hall, J., Menton, W., & Ben-Porath, Y., 2022, *Assessment*, 29(4), 842-853. $N = 164$. MMPI-3 = Minnesota Multiphasic Personality Inventory-3; MMPI-2-RF-EX = MMPI-2 restructured form–expanded version.

Table 2
Descriptive Statistics of Patient Demographic Information

Variable	Total (N = 54)	
	<i>M</i>	(<i>SD</i>)
Age	38.35	(14.28)
Number of Sessions Attended	16.22	(12.06)
	<i>n</i>	%
Gender		
Female	31	57.4
Male	22	40.7
Transgender Male	1	1.9
Race / Ethnicity		
White/Caucasian	39	72.2
Hispanic	7	13.0
Black/African American	4	7.4
Biracial	3	5.6
Asian/Asian-American	1	1.9
Treatment Delivery Modality		
Teletherapy	29	53.7
In-person	25	46.3
MMPI version (INTR scale)		
MMPI-2 (INTR)	27	50.0
MMPI-3 (INTR)	27	50.0

Note. MMPI-2 = Minnesota Multiphasic Personality Inventory-2, MMPI-3 = Minnesota Multiphasic Personality Inventory-3. INTR = Introversion.

Table 3

Means and standard deviations of scores by Overall Sample, by Treatment Delivery Modality group, and by MMPI Version

	Variable	<i>M</i>	<i>SD</i>
Overall sample	Initial OQ-45	78.70	24.87
	Final OQ-45	63.81	28.35
	Treatment Outcome	13.90	19.82
	INTR	62.20	16.37
Teletherapy	Initial OQ-45	78.17	22.20
	Final OQ-45	59.70	28.78
	Treatment Outcome	18.48	19.90
In-person	Initial OQ-45	77.16	28.12
	Final OQ-45	68.60	27.64
	Treatment Outcome	8.56	18.59
MMPI version	MMPI-2 INTR	63.11	18.40
	MMPI-3 INTR	61.30	14.37

Note. Overall sample $N = 54$. Teletherapy $n = 29$, In-person $n = 25$.

OQ-45 = Outcome Questionnaire. Treatment Outcome = Initial OQ-45 – Final OQ-45. MMPI-2 = Minnesota Multiphasic Personality Inventory-2, MMPI-3 = Minnesota Multiphasic Personality Inventory-3. INTR = Introversion.

Table 4

Hypothesis 1.1: Summary of Regression Analysis for Treatment Outcome

Variable	<i>R</i>	<i>R</i> ²	<i>SE</i> of the Estimate	ΔR^2	ΔF	<i>b</i>	<i>SE</i>	<i>t</i>
Model 1	.074	.006	19.950	.006	.290			
INTR						-.090	.167	-.539

Note. INTR = Introversion.

Table 5

Hypothesis 1.2: t-test Results Comparing Treatment Outcome Between Treatment Delivery Modalities

Variable	In-person		Teletherapy		<i>t</i> (52)	<i>p</i> (2-tailed)	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Treatment Outcome	8.56	18.69	18.48	19.99	-1.98	.066	-.513

Note. *n* = 25 (In-person), *n* = 29 (Teletherapy)

Table 6

Hypothesis 1.3: Summary of Regression Analysis for Treatment Outcome by Introversion and Treatment Modality

	<i>R</i>	<i>R</i> ²	<i>SE</i> of the Estimate	ΔR^2	ΔF	<i>b</i>	<i>SE</i>	<i>t</i>
Model 1	.074	.006	19.950	.006	.290			
INTR						-.090	.167	-.539
Model 2	.252	.064	19.360	.064	3.527			
Tx Modality						-9.923	5.284	-1.878
Model 3	.265	.070	19.479	.070	1.924			
INTR						-.099	.164	-.604
Tx Modality						-10.01	5.32	-1.88

Note. INTR = Introversion. Tx Modality = Treatment Modality.

Table 7

Means, standard deviations, and correlations of Introversion, Initial OQ-45, Final OQ-45, Treatment Outcome, Treatment Modality, and Number of Sessions Attended

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Introversion (INTR)	62.20	16.37	-					
2. Initial OQ-45	77.70	24.87	.34*	-				
3. Final OQ-45	63.81	28.35	.35**	.73***	-			
4. Treatment Outcome	13.90	19.82	-.07	.21	.51***	-		
5. Tx Modality	0.46	.50	-.028	-.02	.158	-.25	-	
6. Number of Sessions	16.22	12.06	.066	-.02	-.004	-.02	-.055	-

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

Table 8
Summary of Regression Analysis for Initial OQ-45 by Introversion

Variable	<i>R</i>	<i>R</i> ²	<i>SE</i> of the Estimate	ΔR^2	ΔF	<i>b</i>	<i>SE</i>	<i>t</i>
Model 1	.341	.116	23.61	.099	6.83			
INTR						.518	.20	2.61**

Note. ***p* < .01. INTR = Introversion.

Figure 1

Initial OQ-45 score by Introversion

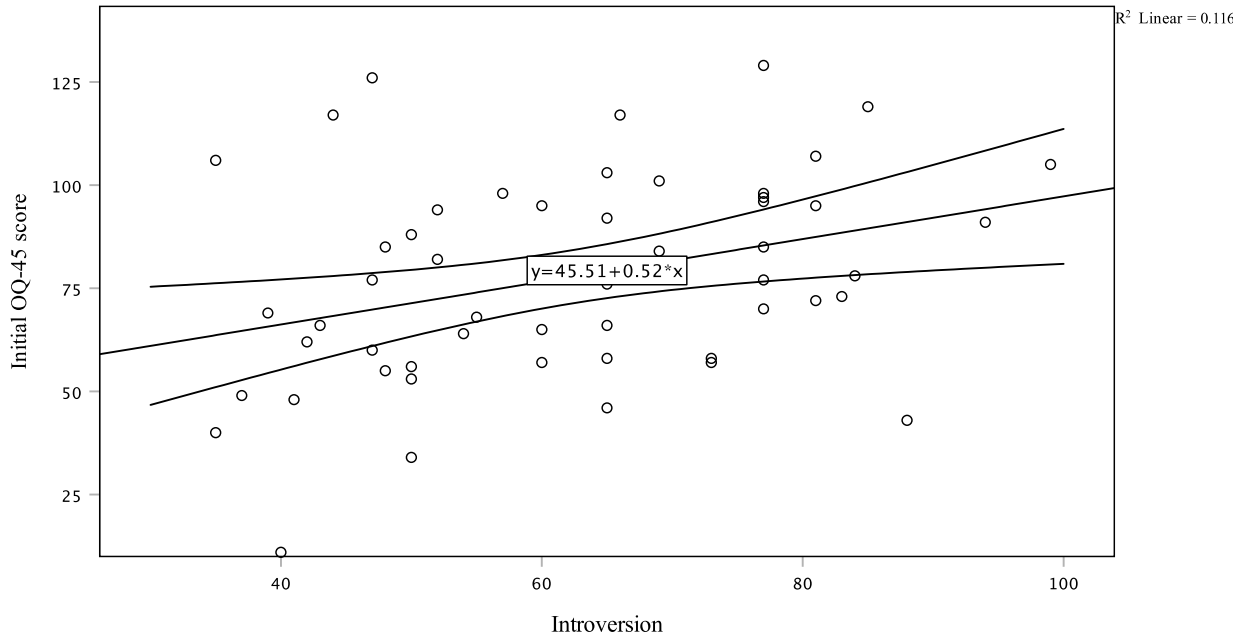


Table 9
Changes in Treatment Outcome from Beginning (Initial OQ) to End (Final OQ) of Treatment

Paired variables	<i>M</i>	<i>SD</i>	<i>t</i> (53)	<i>p</i> (two-sided)	95% CI		Cohen's <i>d</i>
					<i>Lower</i>	<i>Upper</i>	
Initial OQ – Final OQ	13.99	19.82	5.15**	<.001	8.48	19.30	.701

Note. ***p* < .001

Table 10
t-test Results Comparing INTR scores between MMPI-2 and MMPI-3 versions

Variable	MMPI-2		MMPI-3		<i>t</i> (52)	<i>p</i> (2-tailed)	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
INTR	63.11	18.39	61.30	14.37	.40	.688	.11

Note. MMPI-2 = Minnesota Multiphasic Personality Inventory-2, MMPI-3 = Minnesota Multiphasic Personality Inventory-3. INTR = Introversion. *n* = 27 (MMPI-2), *n* = 27 (MMPI-3).

Table 11
t-test Results Comparing Initial OQ-45 Scores Between Timepoints of During the Pandemic and Post-Pandemic

Variable	Pandemic		Post-pandemic		<i>t</i> (52)	<i>p</i> (2-tailed)	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Initial OQ-45	78.17	22.20	77.16	28.12	-.148	.883	-.04

Note. *n* = 29 (Pandemic), *n* = 25 (Post-pandemic).