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TREATMENT PROCESS EVALUATION: THE ROLE OF PERSONALITY FUNCTIONING

By:

Fivos E. Papamalis

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PREFACE

This Thesis "TREATMENT PROCESS EVALUATION: THE ROLE OF PERSONALITY FUNCTIONING" is an evaluation study examining the role of personality functioning in treatment process that was conducted among several treatment centres in various locations in Greece. It has been written to fulfil the graduation requirements of the University of Sheffield for the degree of Doctor of Philosophy. I have been engaged in this research project since May 2010.

The research proposal emerged from authors' experience in the clinical practice as a treatment team leader and person responsible for the organizational functioning. A part of my duties was the continuous monitoring and evaluation aimed at improvement of treatment effectiveness and raising standards of care. As a scientist practitioner, I always had a strong motivation to gain greater insight into the clinical science germane to Substance Use Disorder (SUD) diagnosis and treatment. My determination, dedication and thirst for knowledge encouraged me to get enrolled in this PhD research and to contribute to the scientific enquiry and methodological advancements in the field. The lead supervisor Prof. Petra Meier, with her extensive experience in the scientific base of addiction research and my co-supervisors Dr Froso Kalyva and Dr Dawn Teare, have substantially contributed to convert my broad and an artistic-like form of a research proposal to a feasible research study with the appropriate technical science writing, clear cut research questions and structure. The implementation of the research had some inherent complexities, such as a multi-site administration process which required adjustments of the research protocol. However, there were also external challenges such as the economic recession in Greece which affected treatment providers' capacity to respond to treatment demand or the changes of the drug policy in Greece i.e. administration of methadone in primary care settings. In collaboration with the treatment providers and supervisors' valuable guidance, a response strategy was developed to mitigate these risks.

During the time of the PhD studies, I participated in many extracurricular activities, such as presentations of the research at several conferences, i.e.

- in Prague, Czech Republic at the 14th Conference of European Federation of Therapeutic Communities with a title "Examining the impact of individual and programme level factors on therapeutic process. A multidimensional framework of treatment engagement";
- in Pisa, Italy at the Global Addiction & Europad Joint Conference, with the title "Clinical applicability of dimensional trait based conceptualizations in the treatment of substance misuse";
- in Tirana, Albania at the 6th Adriatic Drug Addiction Treatment Conference, with title "Economic recession and treatment of substance misuse: The need for community resource-driven approach"; and
- in Thessaloniki, Greece at the 7th Annual South East European Doctoral Student Conference Programme with title Substance misuse treatment process evaluation: A dimensional trait-based conceptualization.

During this period, I have also participated in several EU Expert Working Groups on issues related to demand and supply reduction policy and research. Finally, for the needs of this research, I have utilised software which provides the possibility for easier and safer data entry and enables identifying service users' codes, missing data and double registrations. Moreover, beyond the security functionalities, the software also produces automated optical representations of service users' dimensional profile.

Fivos Papamalis
Thessaloniki, 20 June 2017

ABSTRACT

Background: Treatment engagement is a major factor contributing to favourable outcome of drug treatment, but high dropout rates persist. It has remained difficult to draw conclusions regarding specific predictors of engagement, but there is a clear need to identify and target clients' major attrition vulnerabilities. Despite evidence of the association of personality with drug misuse, little is known about its role in the treatment process. **Aims:** This study set out to examine whether, and to what extent, personality functioning contributes to or hinders individuals' treatment journeys. The study examined service users' personality characteristics as potential determinants of treatment initiation, engagement and completion and whether characteristic adaptations are malleable during treatment. **Methodology:** A longitudinal multi-site design was utilized, examining the therapy process in a naturalistic setting in outpatient and inpatient treatment centres. The first part of the study examined whether service users' personality traits (TPQue) and characteristic adaptations (SIPP-118) predict treatment initiation (CEST-Intake), involving n = 200 from 5 outpatient preparation treatment centres. The second part examined whether characteristic adaptations predict treatment engagement (CEST) and completion involving n = 340 participants from 6 inpatient centres. Multivariate regression analyses were applied for hypotheses testing. The final part of the study explored the malleability of characteristic adaptations and examined whether clinically significant change occurred in dysfunctional characteristic adaptations (n = 70). A series of mixed between-within subject analyses of variance were conducted to compare service users who dropped out and those who completed treatment across the two-time periods.

Results: Findings indicated that certain dysfunctional characteristic adaptations are associated with treatment initiation (RQ1) and drop out (RQ3). Broad and facet level characteristic adaptation emerged as strong predictors on different segments of treatment engagement (RQ2). Dysfunctional levels on Self-control and Relational capacities significantly predicted low counselling rapport and treatment participation. The analyses at the facet level provided additional insight of the important role of Identity and Relational capacities on initiation, engagement and treatment completion. The final step shed light on the malleability of characteristic adaptations during treatment and revealed that completers had more functional characteristic adaptations at baseline and had higher levels of significant clinical improvement (RQ4). Only Social concordance remained unchanged at the second inpatient time point. This has important clinical implications considering that Social concordance and especially the Aggression regulation facet was the strongest predictor of treatment initiation, counselling rapport and treatment completion. **Conclusions:** These findings extend our knowledge of the predictive role of characteristic adaptations in the treatment process, and suggest it may be important to capture these individual differences early on. Delineating the role of characteristic adaptations in treatment engagement and their sensitivity to change under treatment may provide the basis for enhancing treatment specificity through individualized interventions that are scientifically-driven and empirically-validated. This is of major clinical relevance, since it provides a node-link mapping of early warning signs of individuals' maladaptive areas that require clinical attention and may open new avenues for the scientific enquiry of personality and treatment.

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Firstly, I would like to express my gratitude to all service users, staff members and managers of the participating services. Without their assistance, this project would not have been possible. Especially warm thanks to the treatment staff in the frontline who facilitated this important endeavor with their support and active involvement. I am very grateful for having Professor Meier, Dr. Teare and Dr. Kalyva as my supervisors in this study. Thank you for your valuable advice, constant support and mentorship. Additionally, I would like to express my profound appreciation to Dr. Kevin Knight for his guidance and technical support. His expertise and dedication to the field of substance misuse was a great enrichment. I wish to give special thanks to Dr. Gerasimo Papanastasato from KETHEA and Dr. Katerina Matsa from 18 ANO, for trusting and believing in this project and for offering solutions at difficult times. Additionally, I would like to thank the administrative and library staff members of the SEERC facilities who have always been a great help. Moreover, I must thank Mr. Zaharis, the director of SEERC and the University of Sheffield for generously supporting this work.

Finally, to my loved ones: My parents, whose unconditional love and support provided the foundation of my strength and will. Thank you for being there for me every time I needed you most, for believing in me and for supporting me to get back on my track. Special gratitude to my life companion and mother of my child Darja Koturovic who provided me the tools to sublimate my inspiration constructively to this piece of work with her love, patients and guidance. Finally, I would like to express my gratitude to my daughter Nefeli Papamalis, who is the main force of my inspiration. You enriched and grounded my life between the academic career and personal life with your hugs and kisses, drawings and dancing's, brought light and happiness, an invaluable value. I am so grateful for being in my life.

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CHAPTER 1: INTRODUCTION

The pervasive impact of substance dependence represents one of the main public health and social concerns worldwide. Empirical studies consistently demonstrate that substance misuse treatment is effective and produces significant measurable changes (e.g. Simpson, Joe, & Broome, 2002). However, since no consistent predictors have been identified (Graff et al., 2009), questions remain regarding which specific components of treatment hinder or facilitate recovery. Two important recent developments guided this study.

The first one refers to the shift in research attention to the treatment process, 'the black box' of treatment. Although, treatment evaluation studies were traditionally focusing on outcome and retention, recent developments in clinical research have highlighted the need for examining treatment process variables. Researchers have shown an increased interest in exploring and trying to decode the factors that influence therapeutic progress. In this regard, treatment engagement has been identified as one of the major factors contributing to the process of change, retention and positive outcome in substance misuse treatment (e.g. Simpson & Danserau, 2008). Regardless substantial evidence for these associations, identification of specific predictors of engagement remains an ongoing research challenge.

The second is related to the recent developments in the field of personality research and the renewed interest in diagnostic evaluation and treatment formulation. After years of separation of personality research from treatment, a considerable literature has grown around the themes of dimensional trait-based evaluation (e.g. Ball, 2005; Krueger & Eaton, 2010; Livesley, 2007), as well as personality matched-interventions (e.g. Conrod et al., 2010; Woick et al., 2009).

Whilst there is substantial attention on the association of substance misuse with personality functioning, there has been very little research regarding its influence on treatment process. It appears there is a need to develop treatment responses that facilitate treatment engagement and target clients' major attrition vulnerabilities. In this context, the complex relationship among clients' long lasting, enduring personality traits and their phenotypic expression in treatment are of particular concern.

From a clinical standpoint, the existing lack of studies exploring personality and treatment creates a worrisome situation given the strong evidence that relate the development and course of Substance Use Disorder (SUD) with certain personality traits (Dawe, Matthew, & Loxton, 2004; de Wit & Richards, 2004). Likewise, comorbidity, especially when SUD co-exist with the presence of Personality Disorder (PD), is one of the most cited reasons for dropping out from treatment, poor prognosis and relapse. This is of concern as studies report very high prevalence rates of comorbidity in SUD treatment (Strathdee, Manning, Best, et al., 2002). At the same time, drop-out rates in SUD treatment are disproportionate when comparing to other fields. A primary concern is that early drop-out represents a wide-spread problem in substance misuse treatment (Bargagli et al., 2006; Darke et al., 2012; Mulder et al., 2009) and is associated with a number of negative implications for individuals, treatment providers and broader community. A crude estimation from data worldwide indicate that around a third of clients usually drop out after the initial assessment, whereas from those who initiate treatment approximately two thirds drop out early on (Cournoyer et al., 2007; Jackson et al., 2006; Jones et al., 2009; Justus, Burling, & Weingardt, 2006; King & Canada, 2004; Sayre et al., 2002; Siqueland et al., 2002; Veach et al., 2000).

However, overlapping symptomatology and exacerbation of symptoms that mimic personality pathology as well as lack of clarity and clear distinction between and within categories, have prompted several prominent researchers, including the working group of the Diagnostic and Statistical Manual of Mental Disorders, 5th ed. (DSM-5), to raise serious concerns about the categorical classification system and suggested alternatives (Wagner, Lloyd, & Gil, 2002; Widiger & Simonsen, 2005).

Following years of robust negotiations and heated debates, the Personality and Personality Disorder Work Group agreed on a well-adjusted compromise. The assessment of Personality Functioning Scale (PFS) of the new DSM-V adopted a hybrid model that simultaneously uses both the categorical along with a dimensional approach for diagnostic evaluation. This provides a more comprehensive assessment of pathological personality trait domains and trait facets, as well as an overall measure of the severity of personality dysfunction (Bender, Morey, & Skodol, 2011; Schmeck et all., 2013). This innovative diagnostic model has a unique clinical applicability since it provides a detailed description of individuals' personality profile including personality traits and characteristic adaptations.

Based on the above, the present research explores, for the first time, the effects of clients' personality dysfunction within the treatment process. The next section provides a review of the existing body of knowledge on treatment engagement and personality dimensions, elucidating the selection of these particular variables for the analysis.

CHAPTER 2: LITERATURE REVIEW

This chapter is divided into two main sections. The first reviews the existing body of knowledge concerning treatment process variables related to treatment engagement and involves behavioural, i.e. treatment participation, cognitive, i.e. motivation, treatment satisfaction, and interpersonal components, i.e. counselling rapport. The second section reflects on the importance of disentangling personality traits from disorders, emphasizes the conceptual differentiation of stable dispositions from their behavioural phenotypes, context sensitive characteristic adaptations, and provides evidence on the association of personality with substance use, misuse, dropout and relapse. Major findings and implications are reviewed and arguments for more comprehensive dimensional investigations regarding individual differences that facilitate research and clinical practice are elucidated. A concluding section indicates gaps apparent in the literature that this study intends to address.

2.1 Treatment engagement

Treatment effectiveness has been related to the length of time that patients spend in treatment and to the provision of sufficient services that adequately correspond to their needs (Simpson, 2001; Simpson & Dansereau, 2008). Although time spent in treatment is positively related to more favourable outcomes, substance misuse treatment is still characterized by high drop-out rates (Cournoyer et al., 2007; Jones et al., 2009). Unfortunately, research has not produced consistent evidence of a profile or group of individual's characteristics that could discriminate those who are prone to drop out from those who are more likely to remain in treatment. Furthermore, several studies support

that retention is not sufficient to achieve favourable treatment outcome and that there is a necessity to examine other moderating variables beyond retention (Fiorentine, Nakasima& Anglin, 1999; Hiller et al., 2002; King & Canada, 2004). In line with this notion, Meier and Barrowclough (2008) posited that whilst retention is a strong predictor of outcome, longer retention *per se* may not be the mechanism that drives outcomes, and in some instances longer retention may not be positive at all. They argued that clients may have various reasons to remain in treatment and comply with the rules, which does not necessarily imply their active participation, commitment, or the fact that the period in treatment had any therapeutic value. Therefore, effective evaluations should also include the treatment process component in order to gain insight of why changes occurred (Simpson, 2004).

Several studies in general psychotherapy and substance misuse indicate that clients' active engagement in therapy has been consistently associated with increased tenure in treatment, reduction of drug use and improved post treatment outcomes (Crits-Cristoph & Connolly, 2003; Fiorentine et al., 1997; Hser et al., 2001; Holdsworth, Bowen, Brown & Howat, 2014; LeBeau, Davies, Culver, & Craske, 2013; Simpson, et al., 1997; Simpson, 2004). Likewise, engagement and positive outcome have been reported in correctional treatment as well (Drieschner & Verschuur, 2010; McCarthy & Duggan, 2010).

However, the multi-dimensionality of the treatment engagement construct and its inter-related components has led to significant conceptual ambiguities. Although engagement is a key contributor of positive outcome in substance misuse treatment, there is not a single established definition that adequately captures its entire meaning, resulting in numerous inconsistencies in operationalization and measurement (see for review on engagement: Holdsworth et al., 2014).

In this context, treatment engagement has been defined variously as dichotomous, singular or multivariate. Further complexity in the literature stems from the utilization of various terms that have been used to examine engagement, including treatment involvement (e.g. Ryan et al., 1995; Simpson et al., 1997), active participation (e.g. Connors et al., 2000), attendance (Fiorentine et al., 1999), adherence (e.g. Edelman & Chambless, 1995), commitment (DeLeon, 1996), compliance (e.g. Sung, Belenko, & Feng, 2001; Wong, Hser & Grella,2002), trusting relationship (e.g. Dixon et al.,1995), and treatment engagement (e.g. Joe et al., 1999). Overall, even though these conceptualizations are different, and involve distinct behavioural, cognitive, motivational and interpersonal components, they identify important process indicators that will be discussed separately.

2.1.1 A dichotomous conceptualization of engagement

Due to its inherent complexity, the concept of engagement overlaps with retention as it is often explored by a dichotomous representation of clients as engaged vs. disengaged. Concurrently, individuals' disengagement is regularly equated in the literature as lack of retention or drop out from treatment, pointing out the significant lack of consensus on standardized definitions (see for review O'Brien, Fahmy & Singh, 2009). Although this dichotomization appears arbitrary, as engagement entails more complex processes than simple presence, treatment retention is a prerequisite of engagement. Nevertheless, considering the variability of therapeutic approaches, services, staff attributes, as well as the divergence of clients' profile, retention rates and predictive characteristics are likely to vary (Broome, Simpson, & Joe, 1999; Joe et al., 1999).

A body of evidence indicates conflicting findings regarding correlates and predictors of retention i.e. drug or alcohol use severity (e.g. Claus, Kindleberger & Dugan, 2002; Darke, Cambell & Poplle, 2012; Marrero et al., 2005) and gender (e.g. Hser et al., 2004; Hser, Evans, & Huang, 2005). There are somewhat more consistent findings for age, as the majority of studies found that older clients are less likely to drop out across treatment modalities (Curran et al., 2007; Jackson et al., 2006). Finally, other factors such as longer period between initial assessment and treatment initiation (Claus & Kindleberger, 2002; Jackson et al., 2006), cocaine (Siqueland et al., 2002; Veach et al., 2000) and alcohol misuse (Schulte et al., 2010) have been linked to increased risk of drop out.

The literature points out complex findings regarding the association of clients' psychiatric severity and retention. For instance, a recent systematic review by Meier & Barrowclough (2009) identified 58 studies that examined the relationship between mental health problems and retention in drug treatment. The findings suggested there are no significant differences in retention rates among clients with co-morbid problems and those without, with an exception of clients who exhibit traits of antisocial personality disorder. However, the authors noted that the evidence base is not unequivocal. Lack of agreed conceptualizations and measurement of retention and mental health problems, variability of the assessment strategies and scarce examination of the intervening process variables, hinder the ability to further explore the disparity of the findings (Meier & Barrowclough, 2009). It may be the case that dual diagnosis does not affect retention, but it remains unclear whether individuals with comorbid mental health problems have the same chances to equally participate, form alliance and adapt to the treatment environment in the same manner. This is of concern, because studies on psychiatric

samples with co morbid substance misuse demonstrate that dual diagnosis is strongly associated with poor compliance and non-engagement (Brown et al., 2011; see for reviews Kreyenbuhl et al., 2009; O'Brien, Fahmy, & Singh, 2009).

Overall, different client factors have been found as predictors of retention, but no single factor has been consistently identified (Hellemann et al., 2009), limiting agreement on the generalizability of the findings (Sayre et al., 2002). It appears that drop out and retention are indices that capture joint effects of many interrelated individual and process variables that may account for the observed variations (Brocato & Wagner, 2008). Hence, questions remain regarding the underlying ingredients that mediate or moderate therapeutic processes. Despite the inextricable bond of engagement and retention, it appears that length of stay is only a primary behavioural indicator of engagement, since the factors associated with clients' initial involvement may be distinct from those associated with their tenure (Weisner et al., 2001). In this context, a number of studies examined engagement by using singular-based conceptualizations of behavioural, cognitive, and interpersonal components.

2.1.2 Participation and attendance: secondary behavioural indicators of engagement

Several studies define engagement along behavioural lines such as client participation, usually in terms of intensity, duration and frequency of clients' attendance (e.g. Connors et al., 2000; Fiorentine, Nakasima & Anglin, 1999; King & Canada, 2004; McCaul, Svikis & Moore, 2001). A longitudinal prospective study by Simpson et al. (1995) was a first of a series of studies attempting to understand the "black box of treatment" by including treatment process components. Using repeated administration of during-process assessments, the study focused on the association of engagement,

measured by session attendance and clients' changes during the three first months after admission.

The two-stage regression model indicated that frequent session attendance, clients' motivation and early alliance are positively associated with engagement, explaining a total 22% of variance. Since then numerous studies have conceptualized attendance as a single proxy for treatment engagement (Ammerman et al., 2006; Geers, Wellman, Seligman, Wukuk & Neff, 2010; Granholm, Auslander, Gottlieb, McQuaid, & McClure, 2006).

Overall, session attendance represents an improvement over retention as an engagement measure, but the assumption that individuals are truly involved in treatment because they are physically present remains problematic (Hiller et al., 2002; Meier & Barrowclough, 2009). Likewise, clients may be engaged within the treatment without being physically present for every single session. Similarly, a longitudinal prospective study by Fiorentine et al. (1999) examined 302 drug users admitted to an outpatient programme by measuring engagement on the basis of clients' weekly participation in counselling sessions. Clients' treatment experience and therapeutic relationship were associated with engagement for both men and women. Although clients' experience in treatment was more predictive than their pretreatment characteristics, the overall explained variance of engagement was modest (27% to 30%), indicating that there might be other important variables that moderate the strength of these associations.

The terms 'involvement', 'attendance' and participation' have been used interchangeably and become conflated in the literature. For example, in some studies it is not reported how participation was operationalized, classified or rated (e.g. Fiorentine et al.,1999), so observations of participation may simple reflect attendance. Also, some studies assess clients' perceptions of their levels of participation with the involvement

subscale of the Treatment Engagement Scale (Hiller, Knight, Leukefeld, & Simpson, 2002) leading to lack of consistent operationalization and clear differentiation on the measurements used. Thus, single behavioural proxies such as attendance in isolation does not reliably indicate engagement and are potentially misleading (Holdsworth et all., 2014). This has led researchers examining treatment engagement to include cognitive and motivational indicators.

2.1.3 Cognitive and motivational indicators of engagement

Several other studies conceptualized engagement in terms of cognitive indicators referring to the degree of clients' commitment to treatment and compliance with the protocols or treatment adherence. For instance, evidence shows that commitment to treatment constitutes key indicator of clients' involvement, retention and greater chances of treatment completion (Broome et al., 1996; DeLeon et al., 1997; Sung, Belenko& Feng, 2001).

Similarly, clients' satisfaction has been identified as one of the key factors of engagement, longer retention and better treatment outcomes (Best et al., 2006; Carlson & Gabriel, 2001; Gordon et al., 2008; Hser et al., 2004; Villafranca et al., 2006). In the project *Match study*, higher levels of treatment satisfaction were associated with higher levels of attendance, reduction in drinking and better treatment outcomes (Donovan, Kadden, DiClemente, & Carroll, 2002). In a recent study, conducted as a part of the COMBINE project, researchers examined the mediation effects between clients' satisfaction with treatment engagement and outcome. The findings suggested that client evaluations of treatment play a substantial role in predicting Alcohol Use Disorder (AUD) treatment outcomes and mediated the effects of client engagement, readiness to change and outcomes. In addition, findings indicated that client's evaluation predicted

treatment outcomes beyond critical treatment process variables that are more commonly examined in AUD and SUD treatment research, such as working alliance, readiness to change, and treatment attendance (Kirouac, Witkiewitz and Donovan, 2016).

Moreover, compliance with treatment is also recognized as an indicator of engagement. For instance, a multisite, prospective, longitudinal study by Wong, Hser and Grella (2002) examined a DATOS-A subsample of 3.384 adolescents admitted to different treatment programmes (TC, residential and outpatient drug free). Engagement was conceptualized based on self-assessed compliance and treatment attendance. Motivation and treatment readiness were significantly positively linked with treatment compliance, whereas having conduct problems, hostility and no remorse significantly negatively related to all compliance measures. However, as authors noted, the moderate association among variables and the interaction of client-programme characteristics, indicated potential effects of treatment modalities on compliance. Finally, the study was limited to only those who stay in treatment for at least a month and no influential interaction effects were revealed.

Similarly, a retrospective study of 150 felony drug offenders by Sung, Belenko and Fenk (2001), found that high frequency of noncompliant behaviours was a significant predictor of lack of engagement and treatment termination. The most common type of noncompliance was disobedience, exhibited through a difficulty to accept authority and follow staff instructions, and psychological withdrawal, manifested by simple attendance to counselling session without particular involvement. Diversification of noncompliant behaviours led authors to posit that noncompliance might not relate to specific behavioural dysfunction, but rather to a general inability to adapt to a highly structured therapeutic environment.

In this context, the aforementioned findings reflect particular importance of the role of motivation and clients' non-compliant behavioural responses in treatment. The most influential empirical models of motivation such as the Transtheoretical model (DiClemente, 2003); Circumstances, Motivation, Readiness, and Suitability model (DeLeon, 2000); the TCU Treatment Motivation model (Simpson & Joe, 1993) and self–determination theory (Deci & Ryan,1985), progressed from traditional simplistic view of motivation as a static personality characteristic, towards a multifaceted dynamic construct influenced by internal and external factors. These interactional models imply that contextual factors such as therapists' or treatment environment contributions may impact motivation.

Despite the conceptual differentiation across models and inconsistencies regarding its association with treatment outcome (Brown et al., 2011; DeLeon, Melnick, & Hawke, 2000; Simpson, 2004; Simpson, Joe, & Broome, 2002), motivation represents a pivotal factor in psychotherapy and a major indicator of engagement in substance misuse treatment (De Leon et al., 2000; Gerdner & Holmberg, 2000; Joe, Simpson, & Broome, 1999). Recently published follow-up findings of the DTORS study identify personal motivation as one of the critical factors of change (Donmall et al., 2009). Reports based on the interviews with clients seeking treatment demonstrate that they perceived motivation as the key factor of treatment progress, regardless of the quality of the treatment provided. Moreover, motivation plays a crucial role in the early stages of therapy, as it is positively associated with the formation of therapeutic alliance, participation and satisfaction (Brocato & Wagner, 2008; Donmall et al., 2009; Gregoire & Burke, 2004; Meier et al, 2005; Principe et al., 2006).

Likewise, lack of motivation for treatment or readiness to change is one of the most cited reasons for lack of engagement, failure to comply and drop-out across settings (Cahill et al., 2003; Connors et al., 2000; DeLeon et al., 2000; Fauziah & Kumar, 2009).

A study by Ball et al. (2006) assessed 24 individuals who prematurely terminated out-patient treatment and reported that reasons of drop-out were mainly related to maladaptive personality functioning, lost motivation or hope for change, as well as interpersonal problems with programme staff. Despite several limitations such as the small sample size that is not representative of the broader drop-out population or the use of retrospective data, the study offers an interesting service users' perspective of the reasons for drop-out. Similarly, low motivation or readiness to change in combination with impaired coping skills and difficulties in social functioning have been linked with lack of engagement and higher rates of premature drop-out from substance misuse treatment (Anderson & Berg, 2001; Broome, Simpson, & Joe, 2002; Dobkin, De Civita, Paraherakis, & Gill, 2002; Simpson & Joe, 1993).

Several studies suggest that clients' motivation and readiness to change (Prochaska, Narcross, & DiClemente, 1994) and level of psychological distress (Eurelings-Bontekoe, Dikestra, & Verchuur, 1995; Principe et al., 2006) influence treatment effectiveness. Furthermore, it has been supported that significant negative consequences of drug use and emotional distress tend to be positively related with higher levels of motivation (e.g. Edens & Willoughby, 1999). This is in accordance with more recent findings that demonstrate positive association between pre - treatment motivation and client problem severity (Boyle, Polinsky, & Hser, 2000; Carey et al., 2001). A study by Joe, Simpson and Broome (1999) partially supports these findings, reporting that positive correlation of pre-treatment depression and alcohol problems with motivation

significantly predicted engagement, while higher severity of cocaine use and hostility predicted premature drop out.

In contrast, a recent study by Field et al. (2007) indicated that clients' baseline characteristics such as drug and alcohol problems, anger, anxiety and depression were related to decreased levels of motivation to change. Based on the above findings, it appears that there is an ambiguous relationship between client pretreatment severity levels and motivation. The inconsistent and contradictory research findings on the associations of motivation with treatment outcome and with client pre-treatment variables may be explained by the fact that motivation, as a multidimensional construct, has been operationalized in a variety of ways. Diversity of measures used and theoretical conceptualizations of motivation complicates the interpretation of the findings. Also, the variety of terms used, such as problem recognition, willingness to sacrifice, willingness to actively participate, have been used interchangeable to describe certain behaviours under the umbrella of motivation. For example, Vanhoeck (2001) conceptualized determinants of treatment motivation as problem recognition or distress and willingness to engage in specific behaviours, while Nelson and Borkovec (1989) view the determinants of motivation as dimensions of client participation including expectation of success, treatment satisfaction and the quality of the therapeutic relationship.

The evidence reviewed here seems to suggest a pertinent role of certain client characteristics that tend to be associated with individual levels of motivation, which in turn may trigger different behavioural responses within the therapeutic environment. This brief overview of a variety of influences that motivation may exert on treatment engagement, as well as its oscillating nature, offers important implications for treatment.

Another potential interpretation of the contradictory findings is that individual behavioural responses may depend on the individuals' stage of change and therapist responses. The manner in which that therapist reacts and responds therapeutically to individual ambivalence may determine the direction of the stage of change and the treatment process.

Problem recognition is the first indicator of clients' readiness to change (e.g. Evans, Li & Hser, 2008). However, at the initial stages of treatment, low problem recognition marked by clients' ambivalence may be problematic, as it is usually exhibited by resistant behaviour. Resistance has been consistently perceived as an indicator of low motivation (e.g. Longshore &Teruya, 2006) and represents an obstacle that hampers adaptive behaviour. Although traditionally viewed as an individual characteristic or lack of will that requires confrontation (Khantzian, 1985), more contemporary approaches, i.e. motivational interviewing framework (Miller & Rollnick, 1991), perceive resistance as an interpersonal behavioural pattern influenced by the client-therapist interaction.

A large and growing body of literature has investigated the dynamic nature of motivation that is influenced by internal and external factors and provides empirical support to different motivational enhancement techniques (see recent meta-analyses Burke et al., 2003; Harvard et al., 2007) that can be used to increase motivation and prevent drop-out. Despite empirical support of motivational interventions, confrontational approaches attempting to "break through" rather than "rolling with" resistance are more frequently applied in SUD treatment. In conjunction with the highly structured and hierarchical-based treatment environment, resistant behaviours are likely to increase. Brehm (1993) labelled this process as reactance, referring to a motivational state where the individual perceives threats to a current or future freedom and becomes

oppositional.

Collectively, these studies outline the critical role of motivation during treatment process and provide important insight regarding the predictive capacity of motivation on treatment initiation, engagement and treatment completion. In view of all that has been mentioned so far, two important themes emerge: a) clients' willingness to follow treatment is not a static characteristic, but a dynamic condition influenced by internal and external triggers, and b) therapist client interaction appears to play a determining role for the levels and direction of the motivational levels.

2.1.4 Interpersonal component of engagement – therapeutic alliance

An interpersonal component has also been pointed out as a necessary precondition of clients' active engagement, particularly in terms of client-therapist relationship. Therapeutic alliance reflects the quality of the relationship or the emotional bond between client and therapist (Bordin, 1979).

Two meta-analyses on the relation of therapeutic alliance and treatment outcome (Horvath & Symonds, 1991; Martin et al., 2000) analysed 24 and 79 studies respectively and applying similar inclusion criteria, reported consistent association of therapeutic alliance across a variety of outcomes. Several other studies support the predictive role of therapeutic alliance on treatment outcome (Horvath, 2001; Puschner et al., 2005). Research findings in general psychotherapy literature consistently show amoderate but reliable association of therapeutic alliance between treatment outcome, while similar size effects of this association have been reported in research on substance misuse treatment as well. In this context, therapeutic alliance has been associated with improved treatment engagement, longer retention and outcome (Babor & Boca, 2002; Best, 2004; Broome, Simpson & Joe, 1999; Joe et al., 2001; Saasti, Gillian, & Cahill,

2007), higher programme participation (Simpson, 2001), greater treatment satisfaction (Dearing et al., 2005; Greener et al., 2007), better treatment responsivity and reduction of drug use during treatment (Joe et al., 2001; Simpson et al., 1995). A comprehensive review by Meier, Barrowclough, and Donmall (2005) investigated the role of therapeutic alliance as predictor of treatment outcome as well as potential factors influencing the quality of alliance in substance misuse treatment. One of the main findings indicates that early therapeutic alliance appears to consistently predict treatment engagement and retention. However, with regards to a direct association of therapeutic alliance and treatment outcome, the evidence appears to be less robust. As the authors posit, causal inferences for this association should be interpreted with caution, as there are is not enough evidence regarding the impact of other intervening variables or events that occur outside the alliance itself (Meier, Barrowclough, & Donmall, 2005).

A meta-analytic review by Sharf, Primavera and Diener (2011) investigated the role of therapeutic alliance as a predictor of drop out by analysing 11 studies. Findings indicated a moderately strong relationship between alliance and drop out, with about 46% of the observed variance reflecting real differences in effect size. Clients with weaker alliance were more likely to drop out and this relationship was negatively influenced by treatment setting which had the largest effect size. However, as authors stated, these findings should be considered exploratory, due to the small number of studies and the amount of data available (Sharf, Primavera, & Diener, 2011).

The literature on clients' psychological functioning and its influence on the formation and maintenance of alliance, is marked by major inconsistencies. Horvath (2001) reviewed the literature on factors that impact the strength of alliance and concluded that there is an interaction among therapists' level of experience, client problem severity and quality of alliance. Several studies found that more severe clients'

psychological problems were negatively associated with alliance (Cournoyer et al., 2007; Hersoug et al., 2001; Lingiardi, Filippucci, & Baiocco, 2005), while other studies did not find such a relationship (e.g. Principe et al., 2006). The above-mentioned review by Meier, Barrowclough, and Donmall (2005) demonstrated that diagnostic client pre-treatment severity does not appear to influence alliance in substance misuse treatment. However, the authors noted that these indications are preliminary and proposed further research on the determinants of alliance, as a significant amount of variability remains unexplained. Nevertheless, there are indications that therapists' perception of alliance appears to be influenced by clients' problem severity that does not fit specific diagnostic criteria. For instance, Meier et al. (2005) found that therapists rated alliance as better for clients with more coping strategies, less hostility, greater social support, less psychological problems and more desire for help. In this context, Cournoyer et al. (2007) reported a negative correlation between therapist alliance ratings and clients' resistance, while a number of authors report that clients with prior dysfunctional social relationships are more likely to have difficulties in establishing and maintaining alliance (Constantino, Castonguay, & Schut, 2002; Hersoug et al., 2001; Horvath, 2001).

These findings raise important issues, given that individuals in substance misuse treatment often exhibit interpersonal problems, maladjustment and are considered difficult to treat. In case therapists tend to be influenced by these characteristics, they might invest less in therapy or engage in dysfunctional interactions that may create ruptures in alliance and result in lack of engagement. Considering the empirical evidence of the role of alliance in early engagement, identification of potential moderators of this association would reduce the amount of variability and allow more specific conclusions (Crits-Christoph et al., 2006; Samstang et al., 2008; Zuroff & Blatt, 2006).

In fact, lack of capturing possible moderators of this relationship has led several authors to question the predictive validity of alliance on treatment outcome (e.g. Crits-Christoph et al., 2006; Samstang et al., 2008). Spinhoven et al. (2007) echoed this notion suggesting that there is a potential confound of outcome and alliance measures, and the quality of therapeutic alliance may solely present an epiphenomenon of positive treatment change. Thus, capturing possible mediators or moderators of alliance, such as the impact of client personality or client therapist interaction, would reduce the amount of variability in the measures utilized and allow more specific conclusions. Overall, clinical and empirical evidence support the critical role of therapeutic alliance in treatment; however, further effort is required to understand the patterns through which alliance impacts therapeutic process and at what point in therapy it is most predictive of outcome (Strauss et al., 2006; Zuroff & Blatt, 2006).

2.1.4.1 Client-related factors and their influence on therapeutic alliance

The establishment of therapeutic alliance appears to be influenced by several client and therapist related factors. Most research on alliance formation has focused on a variety of clients' pretreatment characteristics (e.g. Clarkin & Levy,2004; Connolly Gibbons et al.,2003; Gaston, Marmar& Thompson,1988). Previous literature concerning clients' pretreatment psychological functioning and its influence in the formation and maintenance of therapeutic alliance has been marked by major inconsistencies. This may be attributed to the variety of terms used to capture psychological functioning, non-diagnostic indicators and the application of different measures, which limits the interpretation and comparison among studies.

Several studies found that more severe clients' disturbance was negatively associated with alliance (Cournoyer et al., 2007; Eaton, Abeles, & Gutrfeund, 1988; Gaston, Marmar, Thompson, & Gallagher, 1988; Hersoug et al., 2001; Kivlighan & Schmitz, 1992; Lingiardi, Filippucci, & Baiocco, 2005; Luborsky et al., 1993; Zuroff et al., 2000), while other studies did not find such relationship (i.e. Principe et al., 2006). Horvath (2001) reviewed the literature on client related factors that impact the strength of therapeutic alliance and concluded that there is an interaction among therapists' level of experience, client level severity of impairment and quality of therapeutic alliance. In contrast, the above-mentioned review by Meier, Barrowclough, and Donmall (2005) demonstrated that diagnostic client pre-treatment severity does not appear to influence the alliance in SUD treatment. However, as authors noted, these indications are preliminary and suggested further research on the determinants of the alliance in SUD treatment, as a significant amount of the variability in the therapeutic alliance remains unexplained. Moreover, recent studies in substance misuse treatment indicate that both clients and therapist's alliance ratings were negatively influenced when clients exhibited more psychological problems (Meier et al., 2005; Cournoyer et al., 2007). These conclusions may imply that clients' problem severity levels and related characteristics that do not fit specific diagnostic criteria may have different patterns of influence on the formation of alliance.

For instance, a meta-analysis (Tryon, Blackwell, &Hammel, 2007) examined the correlation and mean difference between therapist and client alliance ratings and indicated that clients with milder disturbances or with substance abuse problems had larger rating discrepancies with their therapists than clients with more severe disturbances. Consistent with previous findings in both general psychotherapy (Cecero et al., 2001; Fitzpatrick et al., 2005; Hilsenroth, Peters, & Ackerman, 2004) and

substance misuse (Meier et al., 2005), Tryon et al., (2007) reported similar rating discrepancies, with clients rating alliance higher than their therapists. It has been suggested that this divergence in perspectives may be related to therapists' previous experience with other clients, clients' prior treatment experience, common free of charge treatment for substance misuse, as well as the lack of knowledge regarding the frames of reference that may be utilized.

Moreover, some studies have found that clients' ratings of the therapeutic alliance are more predictive of outcome than the therapist's perceptions (DeVet, Young, & Charlot-Swilley, 2003; Kazdin, Whitley, & Marciano, 2006; Martin, Garske, & Davis, 2000). This association appears particularly strong when clients assess alliance early in treatment (Castonguay et al., 2006; Horvath &Bedi, 2002; Principe et al., 2006; Strauss et al., 2006; Zuroff & Blatt, 2006). Nevertheless, therapists were found to be able to early identify individuals who may exhibit difficulties to commit to treatment and their ratings were the most important predictor of drop out (Cournoyer et al., 2007). It appears that clients' perceptions regarding the relationship with their therapists are of major importance; however, therapist's prognosis especially in the early phase of treatment may also be valuable, as timely identification of client's attrition vulnerabilities could be addressed by deploying personalized interventions.

Interestingly, therapists' alliance ratings appear to be influenced by certain client characteristics, such as low coping skills, hostility and psychological problems. In line with this, Meier et al. (2005) investigated the relation of client and therapist characteristics with early therapeutic alliance in substance misuse treatment. The study examined 187 individuals in three residential treatment services, by using structured interviews followed by a series of questionnaires completed by both clients and therapists. The overall findings support that clients' motivation, adaptive coping

strategies, social support and secure adult attachment style were strong predictors of early therapeutic alliance. More specifically, therapists rated therapeutic relationship as better, for those clients with more coping strategies, who had secure attachment style, less hostility, greater social support, less psychological problems and more desire for help, while clients rated the alliance in a similar manner. These findings raise important questions given that individuals in substance misuse treatment often have high rates of comorbidity, interpersonal problems, exhibit certain maladaptive personality traits and are considered difficult to treat. In case therapists tend to be influenced by these characteristics, they might invest less into therapy or engage into dysfunctional interaction that may enhance ruptures of the therapeutic alliance and lack of clients' engagement.

In this context, a study by Cournoyer et al. (2007) reported a negative correlation between therapist ratings and clients' resistance, e.g. clients who perceived themselves as being committed to treatment, capable of working in psychotherapeutic context and shared the same goals with their therapist, exhibited more positive attitudes and less resistance and were also viewed by their therapists more positively. These findings also highlight the important role that resistance may have in hindering therapeutic alliance, as it may represent a fundamental obstacle that interferes with therapist's efficacy, creates ruptures in alliance, impedes client motivation and undermines the change process (Cowan & Presbury, 2000; Nystul, 2001). These remarks imply the primary importance of addressing resistance in a flexible and cooperative way as it might offer valuable material for deeper exploration of clients' inner conflicts (Yurk, 1994; Teyber, 2003).

However, regardless of the negative impact on treatment process, resistance appears to remain underemphasized (Samstang et al., 2008). Ruptures in the alliance may be conceptualized as a normal condition in the treatment process that partially

reflects clients' dysfunctional interpersonal patterns (Safran & Muran, 2003). However, in substance misuse treatment, failure to identify and address them early on may be of great importance as it may lead to re-enactments, further ruptures of alliance and premature termination.

Furthermore, during treatment process, therapists' and clients' interpersonal dynamics appear to be affected by previous clients' relational patterns and may reflect the quality of the therapeutic alliance. Regardless of the theoretical orientation, a number of authors report that clients with prior dysfunctional social relationships are more likely to have difficulties in establishing and maintaining therapeutic relationships (Constantino, Castonguay, & Schut, 2002; Hersoug et al., 2002; Horvath, 2001). An underlying assumption of interpersonal theories is that personality is conceptualized based on longstanding dispositions or certain traits and their expression in interpersonal context (Pincus & Wiggins, 1990). Two dominant models, theory of complementarity (e.g. Henry &Strupp, 1994) and interpersonal circumplex model (e.g. Alden, Wiggins, & Pincus, 1990) provide a dynamic perspective that predicts affect and behaviour in interpersonal interactions based on predisposing personality traits. These models provide important findings regarding the relation of clients' interpersonal style and therapeutic alliance. For instance, clients' hostility, coldness, non-assertiveness and social avoidance have been found to predict poor alliance (Paivio & Bahr, 1998). Particularly, hostile-dominant dimension has been associated with significantly poorer alliance (Connolly Gibbons et al., 2003; Gurtman, 1996; Muran et al., 1994; Schauenburg et al., 2000). The relation of clients' hostile interpersonal behaviour with the quality of therapeutic alliance implies the important role that personality functioning may have in the formation of therapeutic alliance and subsequently on treatment process.

Finally, Clarkin and Levy (2004) argue that traits and individual characteristics may undermine the establishment of a constructive therapeutic relationship. This is of concern as SUDs are often considered 'difficult-to-treat' as they tend to be resistant or challenging and the treatment often involves a confrontative approach. Accordingly, it may be assumed that clients low in *Agreeableness* may need increased therapists' attention during the formation of therapeutic alliance, whereas clients' high in hostility may need therapists' interpersonal flexibility and skills in order to avoid ruptures, re-enactments and repair alliance. This is confirmed by a recent study that examined therapeutic alliance as a mediator between personality traits and treatment outcome in patient with major depressive disorder (Kushner, Quilty, Uliaszek, McBride & Bagby, 2016). As a part of a randomized control trail, this study assessed patients' and therapists' ratings of alliance. Utilizing a series of multiple mediation models to examine the influence of personality traits on treatment outcome, they found that early alliance was negatively predicted by lower levels of agreeableness, while neuroticism was the only trait that had a direct effect on treatment outcome, whereby higher neuroticism scores predicted poorer treatment outcomes. The overall findings of the study suggest that patients who prematurely terminated treatment had higher neuroticism scores and lower agreeableness. Kushner et al. (2016) draws our attention to the important role that personality has in treatment process, as well as in treatment outcome.

Several studies attempted to identify client pre-treatment characteristics as determinants of the alliance, but evidence has not been converged meaningfully so far (Gaston et al., 1988; Eltz, Shirk, & Sarlin, 1995; Clarkin & Levy, 2004; Connors et al., 2000; Field et al., 2007). Despite preliminary indications, it is not yet possible to assume with certainty that poor therapeutic alliance is related to lack of engagement or premature dropout (Bickman et al., 2004; DeVet, Young, & Charlot-Swilley, 2003;

Principe et al., 2006; Strauss et al., 2006; Zuroff & Blatt, 2006). It appears that clients' prior maladaptive interpersonal patterns (Sullivan, 1953) and attachment style (Horvath & Symonds, 1991) are transferred into the present relationship with the therapist. Preliminary findings from recent research (i.e. Kushner et al., 2016), indicated that clients who are more at ease with closeness and intimate relationships may establish stronger alliance.

The studies presented thus far provide evidence of the importance of the therapeutic alliance, motivation and client participation in treatment and shed light of the role of personality functioning on treatment engagement. There is a growing body of literature that operationalizes these critical treatment process variables within a unified conceptualization of treatment engagement. This is explored in the following section.

2.1.5 Multivariate engagement model

The treatment process model developed by Simpson (2001) offers a more comprehensive conceptualization of treatment engagement and focuses on the sequential relationships among treatment process variables and their dynamic interplay in the therapeutic environment (Simpson, 2001, 2004; Simpson & Danserau, 2008). This methodological and conceptual framework allows for identification of clients' attributes and their combinations that may mediate and moderate treatment processes (Simpson, 2004). Multilevel assessment of client level factors that may affect early treatment experiences (i.e. *Treatment participation*, the development of *Counselling rapport*, and client *Satisfaction with treatment*), provides an advantageous framework for detection of possible obstacles on treatment engagement. In this line, the model also incorporates motivational aspects (Problem recognition, Desire for help and Treatment readiness) as client level factors that contribute to early treatment process (Simpson, 2004). This

model has been tested by a series of studies in different settings, modalities and populations.

Simpson and his associates, conducted in 1997 the first series of studies focusing on the drug treatment process components, investigating the predictive role of motivation on treatment engagement defined as *Treatment participation, Counselling rapport,* and *Satisfaction with treatment*. As part of the National Drug Abuse Treatment Outcome Study (DATOS; Flynn et al., 1997), 10.010 clients were admitted to 96 drug treatment programmes in 11 cities located throughout the US. By utilizing a two-step analytic approach, the study hypothesized that motivation would influence retention because it improves treatment engagement. A series of Hierarchical Linear Model (HLM) regression analyses were utilized as it allowed to take into account correlations among clients between treatment programmes, as well as analysis at the individual programme level.

Findings of this initial study of this model (Simpson, Joe, Rowan-Szal, et al., 1997) indicated that that pre-treatment motivation affects treatment engagement in all treatment modalities, and specifically provided evidence of the sequential relationship of client treatment readiness, predicted stronger Counselling rapport and Treatment participation. Furthermore, the studies provided evidence of the reciprocal relationship of treatment engagement indicators.

Since then, this research group conducted several large-scale studies focusing on treatment process and multivariable treatment engagement contributing significantly to the available evidence regarding these critical treatment process variables. Subsequently, the multivariable conceptualization of engagement has been adopted in other fields of clinical research. Collectively, these studies revealed a common model that appears to be applicable across treatment modalities.

Taken together, these drug treatment process studies provided consistent evidence that early engagement is directly linked with therapeutic progress and predicts better retention (i.e. Best et al., 2010; Hubbard, Simpson & Woody, 2009). In particular, treatment participation and positive therapeutic alliance are of major importance in the early phases of treatment, and are positively associated with higher pre-treatment levels of clients' motivation and readiness for treatment (Joe et al., 1999; Simpson & Joe, 1993). Furthermore, this model was adapted in UK as a part of a cross-national technology transfer for evaluation of evidence-based procedures for clinical practice. On this basis, using a sample from diverse drug treatment programmes in the UK (Best et al., 2010; Campbell et al., 2007) studies confirmed that treatment participation and alliance were associated with higher levels of motivation and psychosocial functioning.

Together these studies provide important insights into the drug treatment process, the 'black box' of treatment in SUD treatment and reveal the critical role of treatment engagement and specifically Counselling rapport, Treatment participation and Treatment satisfaction on therapeutic change and consequently favourable treatment outcome.

In view of all that has been mentioned so far, it appears that although client pre-treatment characteristics have different patterns of influence on treatment engagement, a significant amount of variance of the factors that influence treatment engagement remains unexplained. Despite substantial advancement offered by the treatment process model, there is a need for further investigation of factors that contribute to or impede the formation of alliance, enhance client participation and satisfaction with treatment. In view of that, the following section focuses on individuals' personality characteristics and reviews the evidence of its association with SUD and treatment in an attempt to set the scene of the main scientific exploration of this study, that is the role of personality functioning in treatment.

2.2 Personality traits and functioning

Over the last two decades, there has been significant research on investigating the complex interaction between personality and substance misuse. This section provides a brief overview of the main reasons that indicate the importance of capturing the role of personality (dys)functioning in treatment process, including i) the implications of disentangling the major overlap among maladaptive personality traits from disorders, ii) the reciprocal relationship among traits, characteristic adaptations and environment influences, iii) the consistent association of behavioural disinhibition, avoidance behavior and reward sensitivity related traits with development of substance use and dependence, and iv) the clinical utility of developing personality-matched interventions, individualized case formulation and treatment planning to facilitate treatment engagement.

2.2.1 Disentangling maladaptive personality functioning from personality disorders

Studies consistently indicate very high prevalence rates of comorbidity in SUD treatment (Godley et al., 2014; Strathdee, Manning, Best, et al., 2002). This of concern since comorbidity significantly impedes treatment progress (van den Bosch & Verheul, 2007) and is one of the most cited reasons for dropping out from treatment and relapse, in particular when SUD co-exists with Personality Disorder (PD). However, diagnostic indicators of ruling out personality disorder symptomatology are based on the behavioural expression and extremity of certain maladaptive personality traits, but substance use disorder alters cognitive, emotional and behavioural functioning, may result in exacerbation of symptoms and therefore mimic personality disorder pathology and complicate differential diagnosis (Ball, 2005; Dawson et al., 2005; Jentsch &

Taylor, 1999). As a result, there is an increased risk for over-diagnosis phenomenon of personality disorder among SUDs.

Consequently, overlapping symptomatology and exacerbation of symptoms that mimic personality pathology, as well as lack of clarity and clear distinction between and within categories, have prompted several prominent researchers, including architects working on the revisions of the diagnostic classification manuals, to raise serious concerns about the categorical classification system and suggested alternatives (Wagner, Lloyd, & Gil, 2002; Widiger & Simonsen, 2005). In this line, current research is evolving towards the recognition that a number personality traits and personality dysfunction commonly observed in drug users do not necessarily reflect diagnosis of personality disorder pathology (Ball, 2005; Krueger & Eaton 2010; Livesley, 2007).

For instance, a study by Rounsaville et al. (1998) found that application of an in-depth clinical interviewing and careful assessment strategies, resulted in a 13% overall decrease in the rate of personality disorder (from 70 to 57%). These findings suggest that discrimination of state vs. trait ambiguities offers important clinical applications as it decreases fluctuations of personality disorders with severity of substance abuse and related personality traits. In the process of recent revision of the American Psychiatric Association (APA) Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013) and the forthcoming edition of the World Health Organization's (WHO) International Classification of Diseases (ICD-11) for Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines, clinical utility has been emphasised as the highest priority of both manuals (ICD and DSM).

Nevertheless, little research attention has been given to matters of clinical utility (First et al. 2015). The fundamental importance of clinical assessment and treatment planning for DSM, is evident from the first paragraph of the introduction to the DSM-

IV-TR: “Our highest priority has been to provide a helpful guide to clinical practice” (Am. Psychiatr. Assoc. 2000, p. xxiii), and was reiterated in DSM-5: “*All of [our] efforts were directed toward the goal of enhancing the clinical usefulness of DSM-5*” (Am. Psychiatr. Assoc. 2013, p. 5). Similarly, developers of ICD-11 have stated that clinical utility deserved to be a major guiding principle for the revision process as an organizing priority for the revision, as long as it does not sacrifice validity as established by the best science available (First et al. 2015, Reed 2010). However, for both manuals treatment planning in the clinical practice has been particularly problematic. Studies demonstrate that clinicians belonging to diverse theoretical orientations also seem to find the manual to be at least somewhat cumbersome and problematic for clinical care (Mullins -Sweatt, Lengel & DeShong, 2016).

One of the criticisms for the neglect of the clinical utility of the classification manuals is that they were written manly by researchers for their concern and interest, neglecting the practical needs and concerns of the clinicians (Kendler 1990; Rounsaville et al. 2002). Most surveys conducted to assess clinicians’ opinions concerning the revisions of the diagnostic manuals during the construction of ICD-10 (Sartorius et al. 1993) and DSM-IV (Setterberg et al. 1991) were primarily concerned on matters of validity rather than clinical utility. However, it would be more beneficial if the surveys were focused on issues directly related to clinical utility; such as ease of usage, communication, and treatment planning (Mullins-Sweatt et al., 2016).

Moreover, during the revisions, the fundamental appropriateness of the DSM-IV-TR for estimating alcohol and other drug problems has been questioned, due to the considerable heterogeneity within categories and the subjectivity of the diagnostic criteria of the assessment tools (Wagner, Lloyd, & Gil, 2002; Widiger & Simonsen, 2005). In line with this, several authors suggested that categorical model should be re-

conceptualized by including progressive methods of dimensional assessment (Ball, 2005; Jackim, 2005; Flynn & Brown, 2008, Verheul, 2001; Krueger et al. 2007; Lowe & Widiger, 2009) and discriminating personality traits from characteristic adaptations (Widiger & Clark, 2000; Clark, 2007; Trull & Durrett, 2005; Livesley, 2007; Samuel et al., 2010).

As a result, studies indicate that only a small percentage of clinicians use the diagnostic manuals in their daily clinical practice (Evans, Reed, Roberts, et al., 2013). In an attempt to bridge this research practice gap, and integrate clinicians' views and needs in the evaluation process, Verheul and his associates developed a self-report measure the Severity Indices of Personality Problems (SIPP-118; Verheul et al., 2008). SIPP-118 is a dimensional self-report questionnaire that measures the core components of personality pathology (or characteristic adaptations) that was based on the opinion of clinical experts in the personality field. First (2010) suggests that "Perhaps the most important goal of psychiatric classification is to help clinicians manage their patients by facilitating the implementation of effective interventions" (p. 466). However, as suggested by the chair and vice-chair of the DSM-5 in their evaluation of the present success of the DSM: "With regard to treatment, lack of treatment specificity is the rule rather than the exception" (Kupfer et al. 2002, p. xviii).

As argued by Mullins-Sweatt et al., (2016), it is clear that diagnostic constructs are poor predictors of treatment needs. He suggested that diagnostic revisions could facilitate the clinical utility of diagnostic manuals by: a) including changes to the definition of a disorder to allow clinicians to identify patients who are most or least likely to respond to a particular treatment, b) providing severity specifiers directly related to treatment selection or dimensions related to treatment-relevant comorbidities and unspecified categories, c) providing dimensional measures to monitor improvement,

and d) revising the diagnostic structural groupings (e.g. providing a single diagnostic class based on treatment response to a particular treatment strategy). It has been suggested that the dimensional traits-based conceptualization provides more reliable scores, disentangles significant overlap between categories, elucidates heterogeneity within categories and reveals valuable information regarding lower-order traits and symptoms (Lowe & Widiger, 2009; Trull &Durrett, 2005).

Krueger et al. proposed a reduction of this large set of disorders and symptoms by developing and using a scale to measure underlying dimensions of personality psychopathology: the Dimensional Assessment of Personality Disorders (DAPD), which is based on 30 fundamental elements (items) and four underlying factors: emotional dysregulation, dissocial behaviour, inhibitedness and compulsivity. The dimensional based assessment instead of assigning individuals to a mental disorder category in a binary approach (have or don't have), quantifies a person's symptoms or characteristics and denotes them with numerical values on one or more scales or continuums. Diagnosis then is not a binary process of deciding the presence or absence of the disorder, but rather the degree to which a particular characteristic is present. Instead of making judgements, the dimensional approach asks the question "how much?"

Thus, disentangling traits from disorders based on a continuum of their intensity and severity indicates the clinical utility of dimensional approach, as it may improve individualized assessments, enhance treatment specificity and facilitate appropriate personality matching interventions. In addition, a flexible (dimensional) classification would offer a more reliable, valid, and explicitly defined basis for making important social and clinical decisions. It is in part for this reason that the authors of the DSM-5 included some supplementary dimensional scales to facilitate clinical decisions. Contemporary diagnosis of the new DSM-V, involves the assessment of Personality

Functioning Scale (PFS) a hybrid model that simultaneously uses the traditional categorical approach of DSM-IV, along with a dimensional approach. This provides a more comprehensive assessment of pathological personality trait domains and trait facets as well as a "Level of Personality Functioning-Scale", as an overall measure of the severity of personality dysfunction (Bender, Morey, & Skodol, 2011; Gore & Widiger, 2013; Schmeck et all., 2013). This approach is a significant step towards improving the clinical utility of the diagnostic manual as it provides a detailed description of individuals' personality profile including personality traits and characteristic adaptations.

During the preparations of the DSM-5, several clinical utility studies were conducted proposing to replace the personality disorder diagnostic categories with the five-factor dimensional model in terms of communication between professionals and clients, ease of use, formulating intervention strategies, and describing global personality (Glover et al. 2012; Lowe & Widiger 2009; Mullins-Sweatt & Widiger 2011; Rottman et al. 2009; Samuel & Widiger 2006, 2011; Spitzer et al. 2008; Sprock 2003). A recent study by Morey et al. (2014) examined psychiatrists' and psychologists' perspectives on the clinical utility and professional communication of the current and alternative DSM-5 model for diagnosing personality pathology. Psychologists preferred the alternative model of personality disorder types (six) and severity rating with the Level of Personality Functioning scale, in regard to comprehensiveness, patient communication, and treatment formulation. Both psychiatrists and psychologists preferred the dimensional trait ratings over the current model in all aspects except for professional communication. Professional communication was rated similar to both models. In line with other studies examining the clinical utility of dimensional approaches, overall psychologists preferred the alternative dimensional model (Glover et al. 2012; Lowe &

Widiger 2009; Mullins-Sweatt & Lengel 2012; Samuel & Widiger 2006). Finally, the preference for the current categorical model in regard to communication with other professionals is not surprising, as clinicians are more familiar and comfortable with the current model as they have been working with it for years (Morey et al., 2014; Mullins-Sweatt et al., 2016).

The difference between the assessment of personality traits and the level of personality functioning measured through the characteristic adaptations is discussed in the following section. Although many controlled treatment outcome studies have been conducted, unfortunately, only few naturalistic studies exist that test the impact of the proposed revisions to the diagnostic manual on the clinical setting (Mullins-Sweatt et al., 2016). It would be useful to conduct naturalistic studies and examine how the diagnostic manual is used in general clinical practice or to examine current and proposed diagnostic models on case conceptualization in treatment process and the usefulness in treatment planning.

Important changes in the diagnosis of SUDs were made in the Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5; APA, 2013a), particularly in direction towards a more dimensional approach that conceptualizes SUD as a single construct. This major change to the DSM-5 would improve the reliability of SUD diagnoses. As stated by the APA (2013a), the diagnostic criteria have been strengthened with the increase in the minimum number of symptoms required for a diagnosis of SUD. Substance use disorders now include dimensional levels of severity and broad dimensions of internalizing and externalizing dysfunction that cut across existing diagnostic categories. Previously, diagnostic criteria divided substance-related disorders into two groups: substance use disorders (substance dependence and substance abuse) and substance-induced disorders (intoxication, withdrawal, and other substance-induced

disorders; APA, 2000). In the DSM-5, substance dependence and substance abuse have been combined into a single disorder, accompanied by criteria for substance-induced disorders (Yu, R, 2016). This change was supported by the findings from an examination of many item response theory studies, which demonstrated that dependence and abuse criteria essentially indicate the same underlying problem and are intermixed across levels of severity (Hasin et al., 2013).

Craving is a new substance disorder criterion added in the DSM-5, which was considered a possible target for biological treatment and found to fit well with the other SUD criteria (Hasin et al., 2013). Diagnostic threshold was also changed; while the DSM-IV-TR required one symptom to be met for a diagnosis of substance abuse, the DSM-5 requires at least two or three (out of a possible 11) for a mild SUD (APA, 2013b). The number of criteria endorsed is used to describe whether an individual has a mild, moderate, or severe SUD (APA, 2013a).

2.2.2 Conceptual distinction of personality traits and characteristic adaptations

Research demonstrates that personality traits are heritable, stable over time and relatively efficient in predicting behavior (e.g. Matthews, Deary, & Whiteman, 2003; Wiggins, 2003). The perception of personality traits as stable internal dispositions has been empirically supported (Costa & McCrae, 1992; Costa & McCrae, 2006). However, there are some controversial findings concerning the stability of personality traits, as a number of authors recognize them as dynamic constructs that are malleable to change over time (Blonigen et al., 2008; Johnson, Hicks, McGue, & Iacono, 2007; Roberts, Caspi, & Moffitt, 2003). Several longitudinal and cross-sectional studies have reported changes in personality traits throughout the lifespan (Blonigen et al., 2008; Caspi,

Roberts, & Shinner, 2005; McGue et al., 1999; Roberts, Walton, & Viechtbauer, 2006). Similar findings have been reported in studies on alcohol (Littlefield, Sher, & Wood, 2009; Roberts at al., 2006; Roberts, Wood, & Smith, 2005), as well as substance use, as there appears to be an exacerbation of traits due to drug use (Jentsch & Taylor, 1999). However, the scope of this section is not to examine the malleability of personality traits, rather to indicate the major difference between traits as basic tendencies and characteristic adaptations that arise from a complex nature-nurture interaction.

Personality traits are usually acknowledged through their behavioural manifestation; however, manifest behaviours are not traits (Harkness & Lilienfeld, 1997). Numerous difficulties in drawing clear distinctions between traits and observable behaviours, as well as conceptual confusion and inaccuracy in operationalization, cause major discrepancies in the personality literature. Throughout the development, personality traits serve as a basis for the development of more individualized personality characteristics. As mentioned above, although personality traits are considered to be relatively stable over time and consistent across situations, McCrae and Costa (1995) distinguished basic tendencies (personality dispositions or traits) from characteristic adaptations, which refer to specific behavioural patterns influenced by dispositional traits and situational variables.[1] For example, Cantor (1990) separated the "having" side of personality dimension which is the basic tendencies or source traits (Tellegen et al., 1991), from the "doing" side, which may correspond to those features of personality termed differently across schools of thought as schemas (e.g. Young, 1994), coping

[1] "Characteristic adaptations are characteristic because they reflect the enduring psychological core of the individual, and they are adaptations because they help the individual fit into the ever-changing social environment. Characteristic adaptations and their configurations vary tremendously across cultures, families and portions of the life span" (McCrae & Costa, 1999, p.144).

skills strategies and distal characteristics (e.g. Marlatt & Donovan, 2005), epigenetic derivates (Wills, 2000) or interpersonal strategies (Teyber, 2003).

Resilience towards stagnation or potential for personal growth may depend on the individuals' ability to develop characteristic adaptations that are congruent with basic tendencies and social environment. The flexibility of these complex regulatory processes in terms of socio-cultural adjustment may be affected by individuals' interpretation of the effects of the social environment and stabilization of basic tendencies through sublimation.

One explanation of the apparently contradicting perspectives is offered by the Five-Factor Theory of personality, in which biologically based tendencies (or traits) and culturally conditioned characteristic adaptations are explicitly distinguished (McCrae & Costa, 1999; McCrae et al., 2000). According to this theory, traits comprise abstract potentials and endogenous dispositions, delineated by the Big Five taxonomy, whereas adaptations include acquired skills, coping strategies, and self-concepts. It is primarily the trait profile determines the style of adaptation, whereas the adaptations themselves determine the level of (mal)adjustment to the environment (McCrae & Costa, 1999). The changeability of personality is likely to be more pronounced for the adaptations than for the traits. McCrae and colleagues (2000, p.184) put it very aptly: "Basic tendencies [traits] follow a pattern of intrinsic maturation, whereas characteristic adaptations respond to the opportunities and incentives of the social environment. This implies, that although socialization agents have little or no impact on personality traits, they can influence their behavioural manifestation thought individuals' characteristic adaptation functioning.

The study of gene-environment interaction appears to have important implications in regards to substance use. Given the genetic, psychobiological and

environmental underpinnings of personality traits, it is argued that their phenotypic expression (characteristic adaptations) in relation to substance use depends on these inter-related patterns. The heritability of genetic tendencies appears to play a major role in the eventual expression of substance dependence (Flagel et al., 2010) and it may be manifested via individuals' personality traits and characteristic adaptations which may further interact with environment and determine the risk for the development of alcohol or drug problems (Erickson, 2007; Reiss & Neiderhiser, 2000).

In line with these perspectives, it has been put forward that there is an interactional mechanism through which individuals tend to select and form environments according to their dispositions, which in turn enhances their phenotypic expression (Plomin et al., 1977; Plomin & Spinath, 2004; Roberts, Caspi, & Moffitt, 2003; Rothbart, Ahadi, & Evans, 2000; Scarr & McCartney 1983). In behavioural genetics, selection of trait-relevant environments may represent the main foundation of personality stability (e.g. Wachel, 1973). For example, a sensation seeking individual may select a lifestyle that provides relief from boredom through novel and thrilling experiences, such as firefighting or rock climbing.

Several developmental psychopathology and diathesis stress models (Oetting & Lynch, 2003; Verheul & van der Brink, 2000; Wachtel, 1977; Wills et al., 2000) appear to share a common standpoint that there is continuous reciprocal interaction among dispositional personality traits and environmental influences in shaping individuals' vulnerability to development of substance use problems. An overall stance of these theories is that personality traits tend to have indirect effects on the development of substance use and misuse. Moreover, these conclusions are congruent with early socialization theories that support that pre-dispositional variation in behavioural

disinhibition increases the risk for problematic socialization, early formation of bonds with deviant peers, drug use and conduct problems (Oetting & Lynch, 2003).

Research on developmental pathways to substance use and abuse provides strong evidence of the interaction of behavioural disinhibition related traits and socialization sources. Particularly, bonding with deviant peers, school maladjustment and deficient socialization appear to mediate the relation of behavioural disinhibition and drug use initiation (Sher & Trull, 1994; Tarter &Vanyukov, 1994; Wills, Windle & Cleary, 1998). Research consistently indicates that sensation seeking has high positive correlation with vulnerability to substance use and dependence (Ball, 2002; Clark, 2004). This view has been supported by several longitudinal studies linking behavioural disinhibition and sensation seeking with early onset of substance use and deviant behaviours (Caspi et al., 1996; Iacono et al., 1999; Newcomb & McGee, 1991).

Acknowledging individuals' vulnerability on a trait level, it appears that dysfunction results from their phenotypic expression in the social environment. Thus, individuals' tendency in shaping and forming social environments may not depend only on basic dispositions but rather on self-efficacy to develop effective adaptive capacities. According to McCrae et al., (2000, p.184) "Traits can be channelled even if they cannot be changed." He supported that although socialization agents may have little impact on traits, they may influence characteristic adaptations. Thus, environment and socialization agents may play a determining role in constructive sublimation of basic tendencies. Given that individuals who misuse substances often develop maladaptive interpersonal patterns and dysfunctional characteristic adaptations, treatment interventions could facilitate the development of more adaptive ways of responding and coping. Thus, conceptual distinction between basic tendencies and adaptive capacities may have particular clinical significance in treatment of substance misuse. This might be

especially important for understanding the role of personality in treatment and formulating individualized treatment planning.

2.2.3 Measuring Five Factor Model traits and characteristic adaptations

Eysenck (1976) pointed out that psychology and specifically personality theory should construct paradigms through model- building and systematic measurement. The core assumption is that individual differences result from a set of biological and genetic invariant factors in human behavior that are operationalized as personality traits. Since research on specific underlying biological or genetic bases of traits has yet to be formulated, relying on quantitative measures as questionnaires provides a solid tool and generally accepted paradigm for assessment of the basic building blocks of personality (Dana, 2005; Krueger & Eaton, 2010).

Five Factor Model (FFM) is the most influential structural model of personality traits that has received extensive empirical support (McCrae & Costa, 2008; Krueger & Eaton, 2010; Widiger & Trull, 2007). FFM forms the base of the higher order structure of personality traits (Markon et al., 2005) and provides a scientific taxonomy to examine personality within a unique framework, rather than separately investigating indefinite individual traits. This model conceptualizes the development and functioning of the whole personality structure and concrete behaviours based on the interaction of predisposed tendencies, culture and life narratives. According to the FFM, traits are basic tendencies rooted in biology, resistant to environmental influences and inaccessible to observation or introspection (McCrae & Costa, 2008). As traits are not directly observable, they must be inferred from patterns of behaviour and experience that appear to be valid trait indicators (Tellegen, 1988). McCrae holds that personality traits are assessed only through individuals' self-concepts and characteristic adaptations and

proposes that a general strategy for addressing this fallibility is averaging across a large pool of items that captures a variety of trait manifestations (Allik & McCrae, 2002).

Several researchers supported that examining treatment effectiveness based on stable personality traits has numerous limitations, since the ability to measure individuals' clinical changes in personality is limited (e.g. Livesley & Jang, 2000; Krueger & Eaton, 2010; Samuel et al., 2010; Verheul et al., 2008). Insensitivity to change and failure to capture (mal)adaptive personality functioning, hinder reliability and validity of some personality measures (Verheul et al., 2008).

In order to respond to these shortcomings, several authors suggest that an effective measurement that captures (mal)adaptive personality functioning should meet certain prerequisites: 1) focus on characteristic adaptations, since they are more malleable to change than traits; 2) be sensitive to change ; and 3) is in a brief self-report format (McCrae et al., 2000; Verheul et al., 2008). A recently developed instrument SIPP-118 (Verheul et al., 2008) appears to meet these requirements and is consistent with the distinction between personality traits and characteristic adaptations (McCrae & Costa, 1999; McCrae et al., 2000). Hence, SIPP-118 measures the core components of personality (mal)functioning (or characteristic adaptations) in accordance with recent perspectives regarding the key features of personality pathology (Cloninger, 2000; Livesley & Jang, 2000; Parker et al., 2002) and dimensional approaches (Widiger & Simonsen, 2005).

2.2.4 Evidence on the association of traits and substance use initiation and misuse

Higher and lower order personality dimensions and substance use initiation and misuse

Studies focusing on the association of personality and alcohol and substance use

initiation have reported a significant relationship with low *Extraversion*, *Agreeableness* and *Conscientiousness* and high *Neuroticism* and *Openness* (Conway et al., 2003; Flory et al., 2002; Malouff et al., 2007; Martin & Sher, 1994; Sher et al., 2000; Tucker et al., 1995). However, other studies found no significant relation of *Openness* (e.g. Zarga &Ghaffari, 2009) or mixed findings for *Extraversion*, with some studies indicating positive relation (Hill et al., 2000; Hill & Yuan, 1999) and others negative relation (LoCastro et al., 2000; Stacy & Newcomb, 1998; Sher et al., 2005). Likewise, inconsistencies have been identified in studies examining substance misuse. Several studies on opioid users reported low *Extraversion*, *Agreeableness* and *Conscientiousness* and high *Neuroticism* (Brooner, Schmidt & Herbst, 2002; Carter et al., 2001; Kornor & Nordik, 2007; Kvisle, 2004), whereas other studies found high *Extraversion* (Dubey et al., 2010; Ruiz, Pincus, and Dickinson, 2003), and no such relation for *Openness* has been found (Brooner, Schmidt & Herbst, 2002; Carter et al., 2001; Kornor & Nordik, 2007). Analogous findings have been reported for alcohol misuse, particularly in regards to *Extraversion*, as some studies reported a positive relation (Benjamin & Wulfert, 2005; Hill et al., 2000; Hill & Yuan, 1999), while others found a negative relation (LoCastro et al., 2000; Stacy & Newcomb, 1998; Sher et al., 2005).

This range of inconsistencies could be related to the measurements used, as many studies examined only specific broad domains of personality without taking into consideration the lower order traits and their significant overlap. For instance, conflicting findings regarding the relation of substance use with the broad domain of *Extraversion* may be due to a high association with Behavioural disinhibition-related traits. The effects of this overlap may be found in studies examining a combination of higher and lower order traits. As such, a longitudinal large-scale study by Terracciano et al. (2008) examined participants who were followed up after 12 and 23 years and found

no association between *Extraversion* and drug use. However, the analysis of *Extraversion* on the lower -level demonstrated that there was a consistent association between high scores on Excitement-seeking and all types of drug use. This may suggest that inconsistencies reported in the studies regarding *Extraversion* may be explained by the different importance given to the Excitement-seeking factor (one of the aspects of Impulsivity) across *Extraversion* measures.

As it appears, findings are fairly contradictory regarding the association of broad personality domains with substance use initiation and abuse. Given that individuals who misuse substances represent a quite heterogeneous group, this may simply reflect their individual differences. As argued, determining global profiles of individuals with substance related problems may be more valuable for supporting theoretical conceptualizations (Arnau, Mondon, & Santacreu, 2008), rather than offering additional value in terms of predicting behaviour or clinical utility.

Examining more specific personality characteristics, research indicates that there are two fundamental systems incorporated in all major trait theories that have been used to explain roots of diverse forms of psychopathology and appear to be linked with drug use initiation and misuse. One system is associated with avoidance *Behavioural inhibition,* while the other is associated broadly with approach behaviour or *Behavioural disinhibition (*Carver, Sutton & Sceier, 2000; Slobodskaya, 2007). Several longitudinal and prospective studies have shown that *Behavioural disinhibition* related traits and *Harm avoidance* during childhood were associated with early onset of substance use and later development of substance misuse (e.g. Cloniger et al.,1988; Dawe et al., 2004; Masse & Tremblay, 1997; Nigg et al., 2006; Tarter et al., 2004). *Avoidance behaviour* is postulated to underlie anxiety related personality traits and appears to be associated with substance use as an effort to reduce negative affect or desire to self-medicate. It is

related to the *Behavioural inhibition* system (Gray & McNaughton, 2000) which serves as a response to punishment, non-reward and novelty via inhibition of behaviour and increased arousal, attention and negative affect. *Avoidance behaviour* is considered to be broadly associated with *Harm avoidance* (Cloniger, 1988), *Neuroticism* (McCrae & Costa, 1995), the *Stress-reduction pathway* (Verheul, 2001) and the *Internalizing spectrum* model (Krueger et al., 2007).

The broad domain of FFM *Neuroticism* refers to the characteristic disposition to experience states of emotional distress (McCrae & Costa, 2008). As such, clients presenting with maladaptive high *Neuroticism* will describe the distress as an ongoing pattern that has become increasingly unbearable. Findings regarding the association of *Avoidance behaviour* and substance use problems are somewhat inconsistent. While a number of studies report a significant negative correlation between *Avoidance behaviour* and substance use problems (e.g. Franken & Muris, 2006; Genovese & Wallace, 2007; Hundt et al., 2008), other studies do not report any significant association (e.g. Knyazev, 2004; Loxton et al., 2008; O'Connor et al., 2009). In contrast, *Approach behaviour* reflects Gray's Behavioural Activation System (BAS), which responds to reward and non-punishment by initiating goal-directed activity (Gray & McNaughton, 2000) and appears to be associated with positive affect and the need for arousal (e.g. Comeau et al., 2004).

Personality dimensions of *Approach behaviour* such as *Sensation/Novelty Seeking* and *Impulsivity* reflect collective behavioural syndromes labelled as *Behavioural under-control* (e.g. Sher et al., 2000), *Behavioural dysregulation* (e.g. Sanislow et al., 2002), or *Behavioural disinhibition* (e.g. Ball, 2005; Dawe et al., 2004). *Behavioural disinhibition* related traits have been associated with the *Externalizing spectrum* model (e.g. Krueger et al., 2007). Regardless of the variability of samples and

the diversity of measures, studies indicate that *Approach behaviour* related traits used under different terminology, such as *Behavioural disinhibition*, *Novelty Seeking* or *Impulsivity*, are consistently found to be associated with substance misuse (e.g. Franken &Muris, 2006; Hundt et al., 2008; Genovese &Wallace, 2007) and alcohol misuse (e.g. Kimbrel et al., 2007; Loxton et al., 2008). However, a study of Hasking (2006) failed to identify a significant association between substance use problems and BAS sensitivity in a sample of young adolescents.

While *Behavioural disinhibition* has been consistently found to relate with substance use, the association of *Avoidance behaviour* appears to be less robust (Alli et al., 2016). The construct of *Impulsivity*, however, is incorporated in all major trait-based models of personality (Acton, 2003; Kambouropoulos & Staiger, 2007; Krueger et al., 2007) resulting in significant overlap among theoretical conceptualizations and measurements. Hence, numerous authors argue *Impulsivity* represents a multi-dimensional construct, mainly consisted of two related dimensions with different neural pathways that influence drug dependence (e.g. Dawe, Matthew, & Loxton, 2004; de Wit & Richards, 2004; Moeller et al., 2001). In line with this, Dawe, Gullo and Loxton (2004) proposed that there are two separate facets of *Behavioural disinhibition* (*Impulsivity*) associated with substance abuse, *Reward drive* and *Rash impulsiveness*. *Reward sensitivity* is closely aligned with Gray's conceptualization of *Impulsiveness* and involves a "heightened sensitivity to unconditioned and conditioned rewarding stimuli" (Dawe, et al., 2004; p. 1399). In contrary, *Rash impulsiveness* relates to *Behavioural disinhibition* and involves a decreased ability to control behaviour or stop drug use regardless of the future negative consequences of that behaviour (Dawe, Gullo, & Loxton, 2004; Dawe, Matthew, & Loxton, 2004).

In summary, two systems including *Avoidant behaviour* and *Approach behaviour*

are used to explain the underlying factors of substance use initiation and misuse. However, research on approach behaviour distinguishes *Behavioural disinhibition* from *Reward sensitivity* as two separate systems with different neural pathways that influence drug misuse. As the construct of *Impulsivity* plays a vital role in different forms of psychopathology and substance use, the implications of this discrimination are important for both scientific and clinical purposes. This separation may facilitate conceptualizations of related traits and their measurements, and offer deeper understanding of the underlying pathways of substance misuse. Thus, it can be assumed that high levels of *Sensation seeking* may be a powerful incentive to start experimenting with alcohol or other illicit drugs, while *Impulsive* traits may be responsible for the following loss of control and the development of dependence (Kambouropoulos & Staiger, 2007). Given the strong evidence indicating the association of specific clusters of personality traits with substance use initiation and misuse presented above, it is of vital importance to examine whether these traits may be related to treatment process and outcome.

2.2.5 Evidence on the association of personality traits with treatment, drop-out and relapse

This section explores potential effects that personality traits may have on treatment response. Despite consistent findings that relate the development and course of SUD with certain personality traits, surprisingly there has been little research regarding the dynamic interplay between personality traits and treatment. Due to the limited number of relevant studies examining the relation of traits and specific components of engagement, studies on their association with relapse and dropout will also be examined. Moreover, as lack of treatment engagement represents a reliable predictor of premature

termination and negative treatment outcome, this review may point out important implications related to the role of personality traits within the treatment process.

In terms of implications of the Five Factor personality traits, low *Extraversion* has been associated with difficulties in interpersonal relationships, which may consequently hinder the establishment of alliance and treatment progress (Ball, 2005; Miller, 1991). In contrast, it has been supported that high *Extraverts*, due to their increased need for stimulation and disinhibitory tendencies may be less conditioned to contextual norms, which may be an obstacle to adjust to structural treatment environment (Dubey et al., 2010). Additionally, Miller (1991) found that individuals with low scores on *Conscientiousness* are more prone to exhibit resistance and difficulties in forming alliance. Moreover, Miller noted that low *Agreeableness* and low *Openness* are related with interpersonal antagonism, scepticism about treatment and resistance. Finally, he proposed that the particular combination of high *Neuroticism,* low *Extraversion,* and low *Conscientiousness* might be more difficult in regards to treatment progress, as these clients often tend to be resistant and oppose treatment interventions (Miller, 1991). Kudo and his associates (2016) in their recent study confirm Miller's previous assumptions that individuals with low levels on *Agreeableness* and high on *Neuroticism* will have difficulties during treatment process. In order to investigate the influence of personality on treatment outcome, a study using a sample with major depressive disorder examined the sample at baseline and at 6-month follow-up. The Temperament and Personality Questionnaire (T&P; Parker & Roy, 2002) was used to assess personality. The findings indicated that higher scores on T&P *personal reserve* predicted poorer treatment outcome in patients with major depressive disorder. *Personal reserve* crossmatches with *Introversion* FFM and T&P *self-criticism* and *rejection sensitivity* traits crossmatches with the FFM *Neuroticism* and these traits were associated

with non-remitters at the 6-month follow up. These findings are in line with previous studies that reported that higher levels of *Introversion* predict poorer treatment outcomes (Quilty et al., 2008)

Furthermore, many recent studies (e.g. Aluja et al., 2007; Gudjonsson & Sigurdsson, 2003; Gudjonsson et al., 2002; Mullins-Sweatt & Widiger, 2007) have shown that high *Neuroticism* is associated with non-compliance, denial and behavioural disengagement. A recent study by Shahrazad et al. (2011) found that high *Neuroticism* and low *Psychoticism* significantly predicted lower readiness to change addictive behaviours. On the lower order traits level, studies applying the theory of complementarity (Henry & Strupp, 1994) and the interpersonal circumplex model (Alden, Wiggins, & Pincus, 1990) provide important findings regarding the relation of clients' personality style and the therapeutic alliance. For instance, clients' *Hostility, Coldness, Non-assertiveness* and *Social avoidance* were found to predict poor alliance (Gibbons et al., 2003; Gurtman, 1996; Muran et al., 1994; Paivio & Bahr, 1998; Schauenburg et al., 2000). The relation of clients' *Hostile* interpersonal behaviour with the quality of alliance implies the important role that traits may have in its formation and subsequently in the treatment process.

Given that therapists and clients are in constant interaction in the therapeutic encounter, their interpersonal dynamics are transferred into the present relationship. That is, factors related to both client and therapist may represent fundamental obstacles that may facilitate or hinder clients' engagement and undermine the change process.

A study by Winters et al. (2008) examined the association of treatment retention and treatment outcome in a subtype of adolescents consisting of individuals with internalizing (anxiety and mood disorders) and externalizing symptoms (attention deficit, oppositional defiant and conduct disorders) at a 12-Step Minnesota Model

programme. The findings demonstrated that adolescents with externalizing symptoms exhibit poorer outcomes in all measures, including poorer retention, higher rates of relapse, greater drug use and poorer outcome, in contrast with those with internalizing symptoms. This finding suggests that individuals with externalizing symptoms and features of delinquency or deviant behaviour (sensation seeking traits, behavioural disinhibition, poor social skills) tend to have poor treatment outcomes (Wise, Cuffe, Fischer, 2001; Crowley et al., 1998). This is in accordance with several previous studies (Brown, Gleghorn, Schuckit, Myers, & Mott, 1996; Crowley et al., 1998; Tomlinson, Brown, & Abrantes, 2004) which found the prognostic significance of conduct features for drug abusing adolescents.

Likewise, *Externalizing* personality dimensions have been associated with increased likelihood of non-engagement and dropout (Best et al., 2009; Loeffler-Stastka, 2011). A recent review found that *Impulsivity* and related traits negatively predict treatment response in cocaine dependence (Poling, Kosten & Sofuoglu, 2007). This is in accordance with previous studies that reported positive association of *Impulsivity* (e.g. McCown, 1989) and *Sensation/Novelty seeking* (e.g. Kravitz et al., 1999) with drop-out. Additionally, clients who enter treatment with increased levels of *Hostility, Risk-Taking and Antisocial* traits were found to be less involved in treatment and more likely to drop out (Joe et al., 1999; Lang & Belenko, 2000; Meier & Barrowclough, 2009; Simpson et al., 1995). Similar findings have been reported in the literature in the field of judiciary. Vreugdenhil, Doreleijers, Vermeiren, Wouters, and Van den Brink (2004) have considered the effects of the severe aggression regulation problems for most juveniles in detention, which is associated with high recidivism risk and negative treatment outcome in combination with conduct disorder (CD) and oppositional deficit disorder (ODD).

In regard to the role of the five broad personality domains in predicting treatment outcome, the few studies report negative association with high *Neuroticism* (Miller, 1991; Muench, 2004; Ogrodniczuk et al., 2003). A recent study by Kushner et al., (2016) confirmed that high *Neuroticism* is related to poorer treatment outcome. The study by Scalise, Berkel, and Whitlock (2010) that also examined the role personality traits may have on treatment outcome in brief outpatient substance misuse treatment, contrast with the above findings. Unexpectedly, the results indicated that higher levels of *Neuroticism* corresponded with increased completion chances, while higher levels of agitation in the negative affective status correlated positively with lower treatment completion rates (Scalise, et al., 2010). Interestingly, from the studies above that reported linkages of high *Neuroticism* with poor treatment outcomes, only the study by Muench (2004) that was a Doctoral dissertation had a SUD sample.

Previous studies that examined the relation of broad personality domains and relapse, reported that low *Conscientiousness* and *Extraversion* and high *Neuroticism* tend to be strong predictors of relapse following alcohol and substance misuse treatment (Bottlender & Soyka 2005; Fisher, Elias & Ritz, 1998). However, a study by Muller et al. (2008) examined 176 alcohol dependent individuals attending an in-patient psychosocial treatment and found no significant relation between high *Neuroticism* and low *Conscientiousness* in predicting relapse. Integrating several self-reports that capture broad and lower order traits, the authors conducted classification and regression tree analysis to examine traits as predictors of relapse.

The results indicated that individuals who scored high on *Psychoticism* (characterized as uninhibited, hostile and aggressive), *Novelty Seeking* and *Impulsivity* and low on *Persistence* are significantly at greater risk for relapse. However, the statistical technique utilized does not separate main effects of predictor variables from

interaction effects and lacks formal procedure of statistical inference. Similar findings have been reported by studies examining the association of lower order traits such as *Persistence*, *Novelty Seeking* and *Impulsivity* with relapse (Cannon, Keefe, & Clark, 1997; Evren et al., 2011; Janowsky, et al., 1999; Meszaros, 1999; Sellman et al., 1997). These findings reflect the importance of specific clusters such as *Behavioral disinhibition* related traits in predicting relapse.

In summary, the inconsistencies among studies that focused on broad personality dimensions may be explained by the fact that the personality inventories used fail to capture important dimensions of lower order traits. Hence, a multi-level assessment of traits (e.g. Muller et al., 2008) captures both broad and lower order traits, and may be more reliable for drawing conclusions. In addition, some studies assessed personality traits early on without follow-up re-assessment, which may have caused inflated scores that reflect individuals' current condition rather than personality. Another possible explanation is that due to trait-state artefact hypothesis that refers to the inflated traits by the state-induced distortion of the individuals' current condition, personality scales may be more sensitive to state changes (Verheul & van den Bink, 2000). Thus, measures of *Neuroticism* or affective stages may be sensitive to mood changes. This is particularly important for individuals with substance use problems, who may exhibit exacerbation of traits and states as a result of active drug use. Finally, some studies applied imprecise outcome or relapse measurements, while others employed statistical techniques that did not allow for multivariate models (e.g. Fisher et al. 1998), which may have influenced the results.

Overall, it appears that individuals who score high on *Behavioural disinhibition*, characterized by low *Impulse control*, *Urgency* and difficulty in delaying *Gratification*, may exhibit difficulties in treatment participation. Similarly, increased *Hostility*,

Aggression, and low *Persistence* may negatively affect individuals' interaction within treatment environment, create ruptures in alliance and prevent bonding with group members. Finally, the above findings point out that the association of personality traits with dropout and relapse may represent a reliable indicator of major individual vulnerabilities that hinder treatment engagement. In light of research findings provided in this review, there is a need to further explore whether and how personality dimensions are associated with or likely to influence individuals' treatment responses. This study aims to fill this gap.

2.3 Summary

To summarise, the concept of treatment engagement entails a number of interrelated components. Treatment retention represents a primary behavioural proxy of individuals' engagement, while participation, commitment, and compliance constitute an added value that has been associated with greater active involvement in treatment. Likewise, weak therapeutic alliance has been related to low motivation for treatment, resistance and difficulties in interpersonal functioning. Despite immense efforts, research has not produced consistent evidence on clients' profile or other indicators that could discriminate those individuals who are prone to drop out or less likely to engage in treatment from those who will engage and do well in treatment.

Even though multivariate frameworks of engagement provide evidence of a positive association with better outcomes, a significant amount of variance of the factors influencing engagement remains unexplained. Therefore, identifying underlying factors that predict engagement denotes an ongoing research challenge. While the influence of client pre-treatment characteristics (demographics, mental health problems, drug use) has been extensively researched, knowledge of the role of clients' personality traits and

adaptive capacities in treatment is lacking. A growing body of research provides empirical support of the association of certain dysfunctional levels of personality traits with substance misuse, as well as in predicting behavioural manifestations.

Given the significant association of personality traits with dropout and relapse, it is somewhat surprising that to date only limited efforts have been made to identify their role within the drug treatment process. As Joe et al. (1999) suggested, therapeutic involvement requires a certain degree of adaptation in the social context. In this process, phenotypic expression of individuals' adaptive capacities may vary according to their predisposed tendencies and contextual triggers. Thus, it can be argued that any variation of the behavioural responses may result from the individuals' characteristic adaptations and the flexibility of the contextual environment to absorb those who exhibit difficulties in adapting to treatment norms. Therefore, the identification of personality dimensions that may activate dysfunctional behavioural patterns during treatment is of major importance. It might enhance treatment providers' ability to facilitate individuals' adaptation and allow greater flexibility to respond to the diversified clients' needs. Likewise, the underlying assumption of personality-matching interventions (Conrod et al., 2010; Woick et al., 2009) is that individuals with different clusters of personality traits or personality functioning will exhibit different treatment responses. Thus, if more defined moderating variables of engagement could be identified, the risk of premature termination could be addressed by acknowledging individual proneness early on.

CHAPTER 3: THE PRESENT STUDY

3.1 Importance of the study

Studies have consistently shown that clients' active engagement represents one of the most robust predictors of favourable outcome in substance misuse treatment. Much uncertainty still exists about the relationship between client pre-treatment characteristics and engagement, while the role of characteristic adaptations has not been investigated. The aim of this study was to evaluate the current state of knowledge in the field of treatment engagement and personality functioning. A general shortcoming in personality research to date is the disproportional focus on service users' maladaptive characteristic adaptations. Only a handful of studies have examined the role of characteristic adaptations in treatment and they were conducted only in mental health settings (i.e. Feenstra, Hutsebaut, Verheul, & van Limbeek, 2014). Research and treatment strategies targeting dysfunctional characteristic adaptations in substance misuse treatment services are equally important to ensure the provision of 'best-practice guidance' based on empirical evidence. Further investigation of the role of personality dimensions in treatment process is of vital importance, since potential clinical improvements could be achieved if therapeutic interventions were tailored to individual differences.

This research seeks to fill the gap in the research concerning the extent to which characteristic adaptations may influence three equally important phases of the therapeutic journey; treatment initiation, treatment engagement and treatment completion. It is hoped that findings will help explain major inconsistencies found in the literature and potentially contribute to the development of more personalised treatment planning taking into account clients' pre-existing vulnerabilities.

The integration of treatment process evaluation and personality provides an exciting opportunity to advance our knowledge of the role of personality functioning in treatment process and offers several important implications bridging research and clinical practice. Associations among characteristic adaptations, personality traits and engagement would imply a broader conceptual framework in which engagement modifications are viewed in the context of this interaction.

From the clinical perspective, delineating the role of personality functioning within treatment process provides an important opportunity to advance the understanding that could contribute to the identification of individual attrition vulnerabilities so that they could be adequately addressed early on, to prevent premature termination and enhance clients' engagement. Practically, this would imply that despite personality traits stability, treatment interventions could moderate the degree of dysfunctional behavioural phenotypes by targeting the partially context-sensitive characteristic adaptations.

The conceptual distinction between basic tendencies and characteristic adaptations may have particular clinical significance in the treatment of substance misuse. This might be especially important for formulating individualized treatment planning. Targeted therapeutic interventions tailored to clients' personality profile could therefore raise realistic expectations for the degree of potential change and facilitate the sublimation of basic tendencies through more functional characteristic adaptations.

Thus, acknowledging individuals' personality profile and adaptive capacities may increase treatment effectiveness by improving the quality of the personalized interventions, identifying and modifying potential obstacles in the therapeutic process and enhancing treatment response specificity.

Clinical research on personality and treatment effectiveness has been driven mainly by predisposed traits as stable individual characteristics. This causes certain drawbacks, since the ability of measures used to capture potential changes in personality is being questioned by numerous prominent authors (e.g. Verheul, 2005; Livesley, 2010; Krueger & Eaton, 2010). Failure to capture (mal)adaptive personality functioning, as well as the changes occurred during the therapeutic process, represents a major obstacle in the clinical research field. Therefore, this study makes a major contribution to research and theory on monitoring of service users' characteristic adaptations progress during the therapeutic journey by demonstrating whether there are any changes on the dysfunctional levels. The pre-and during process evaluation of characteristic adaptations will not only indicate the malleability of characteristic adaptation but also the effects of treatment between the treatment completers and those who dropped out.

3.2. Aims and conceptualization

The purpose of this study is to examine the extent to which service users' personality functioning enhances or hinders treatment progress and engagement in treatment. The aims of this study are fourfold.

1. The first aim of the study is to investigate the broad and facet level traits, as well as the characteristic adaptations, as predictors of treatment initiation. Their identification may lead to refinements in early treatment interventions and prevent early drop out from treatment. (Outpatient - preparation phase).

2. The second aim of the study is to add to prior research by quantitatively examining the direct and indirect effects of characteristic adaptations on a set of defined treatment engagement indicators – namely, *Counselling rapport, Treatment participation* and *Treatment satisfaction*. (Inpatient - treatment process).

3. The third aim of the study is to investigate the predictive role of characteristic adaptations on treatment completion. (Inpatient - treatment completion).

4. Finally, the fourth aim of the study is to examine whether there are any changes of the dysfunctional characteristic adaptations as measured across the pre-and during process treatment assessments and whether potential changes towards more functional levels differ between the treatment completers and drop out group.

3.3. Research questions and hypotheses

The question that this study aims to answer is whether, to what extent, and in which way different personality dimensions contribute to or hinder treatment progress and individuals' engagement in treatment. Specifically:

1. Are there any significant differences in personality traits and characteristic adaptations between individuals who initiated treatment and those who drop-out during the outpatient preparation phase?
2. Do individuals' characteristic adaptations differ significantly among individuals who are more or less engaged? If so, can we explain variation in the engagement indicators according to the levels of clients' characteristic adaptations?
3. Do individuals' characteristic adaptations differ significantly among individuals who complete treatment and those who drop out? If so, can individuals' overall characteristic adaptations profile be used as a prognostic indicator of treatment completion?
4. Are there any significant changes in the levels of dysfunctional characteristic adaptations between pre- and during-treatment assessment? If so, do these differ according to completion or drop out status?

Hypotheses

A. Treatment initiation will be predicted by levels of maladaptive personality dimensions
B. Treatment engagement will be predicted by lower levels of dysfunctional characteristic adaptations, with different relationships between characteristics adaptations and the three measured engagement components; therapeutic alliance, active participation in treatment and treatment satisfaction
C. Treatment completion will be predicted by lower levels of dysfunctional characteristic adaptations.
D. During treatment, there will be an improvement of the dysfunctional characteristic adaptations levels from baseline to during-treatment assessment.

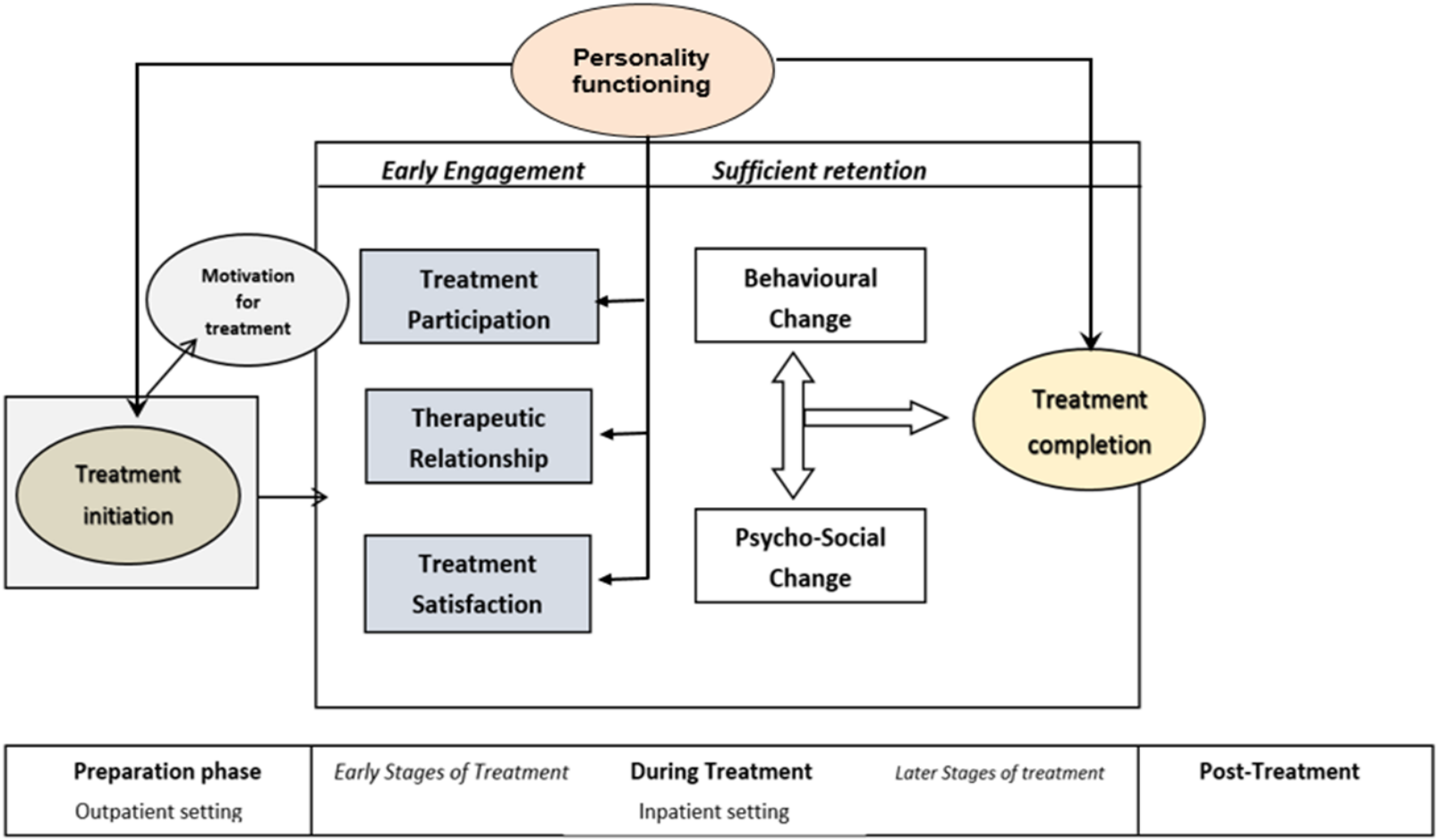


Figure 1. Visual representation of the study conceptualization

Note: This figure is modified version of Texas Christian University Treatment Process Model (Simpson, 2001). The coloured areas highlight the scope of the present study, including treatment initiation; treatment engagement indicators selected for this study and treatment completion. Personality functioning involves personality traits for treatment initiation and characteristic adaptations for all the examined variables. Other stages of treatment (e.g. later stages) along with their elements (e.g. behavioral

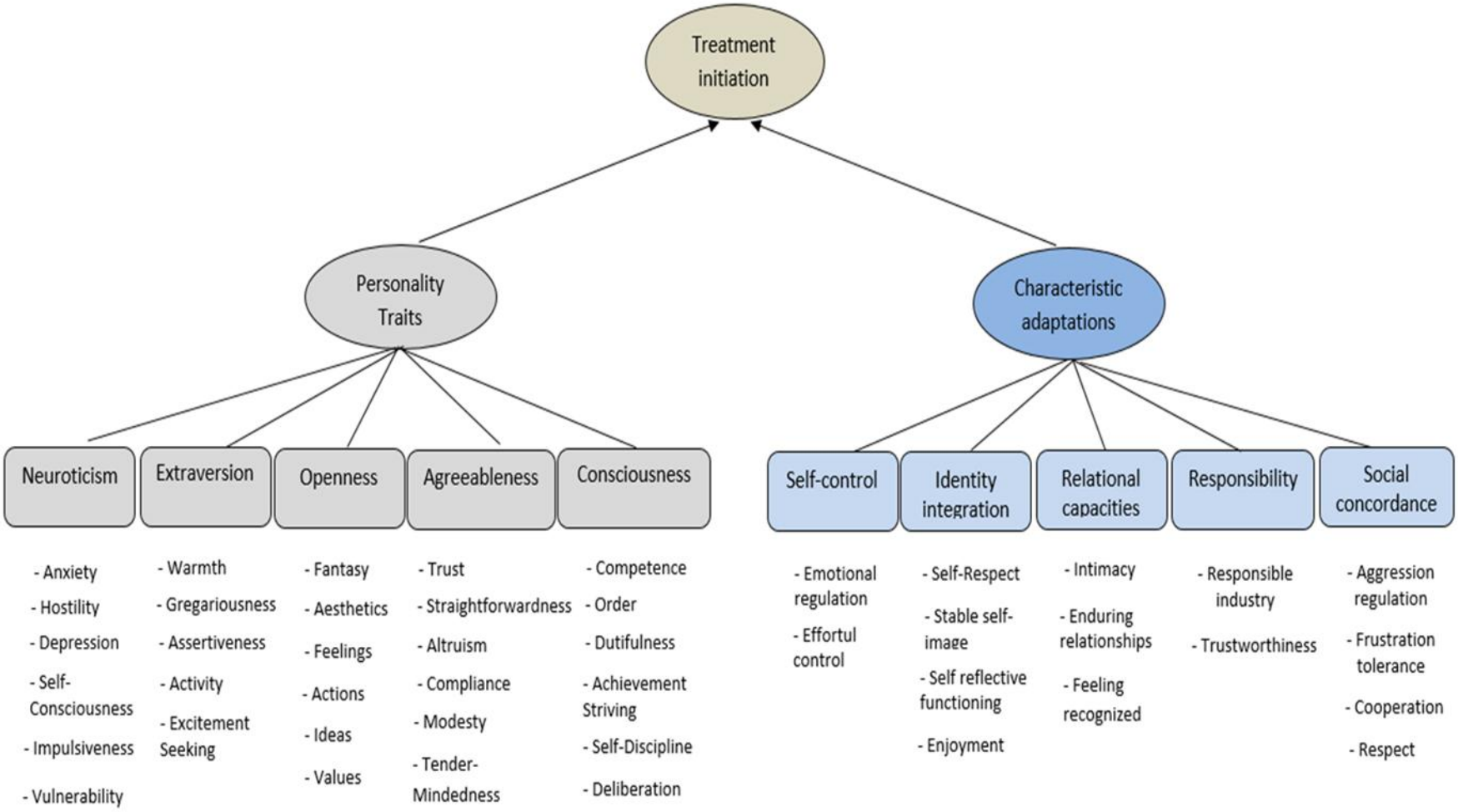


Figure 2. Association of broad personality traits and characteristic adaptations with treatment initiation

CHAPTER 4: METHODOLOGY

Chapters 1 to 3 reviewed relevant evidence underlying this study and ended in a presentation of the conceptualization and main research questions. This chapter outlines the selected research design and ethical considerations.

The first part of this section provides a description of the study design, with sampling strategy, the recruitment of services and service users, and the measures utilised and the procedure used during the different assessment points. Both recruitment and assessment points are described in the order in which clients were sampled during the study. It starts with Sample 1, clients in the outpatient preparation phase and the two associated services. The description then moves to Sample 2, the inpatient sample and the associated services Finally, the statistical analyses for both phases of the study are presented at the end of this chapter.

4.1 Study design

The therapy process was examined in a naturalistic setting. A quantitative multi-site individual follow-up design was utilized to explore the relationship between service users' characteristic adaptations and their engagement treatment in a number of treatment sites with different treatment philosophies, covering both Therapeutic Community (TC) and Psychosocial Rehabilitation (PR) approaches and outpatient and inpatient treatment phases. The first part of the study examined whether service users' personality traits and characteristic adaptations predict treatment initiation (that is completing the outpatient preparation phase, Sample 1). The second part of the study examined whether characteristic adaptations predict treatment engagement and treatment completion in an inpatient setting (Sample 2). This study was in accordance with the treatment process model of the Texas Christian University (Simpson, 2004), as

described in Chapter 3 and conceptualized clients' engagement in the same manner. Finally, the final part of the study explored the malleability of characteristic adaptations during treatment and examined whether clinically significant change occurred in terms of improvement of dysfunctional characteristic adaptations, and whether this differed between those who completed treatment and those who dropped out.

This study uses quantitative data collection and analysis to test hypotheses about the relationships among personality traits, characteristic adaptations and engagement indicators, More specifically the reasons for the quantitative approach in this process-oriented study are: a) identify patterns and significant associations among major study variables b) examine key predictors among personality dimensions and engagement indicators in the context of substance misuse treatment, c) elucidate and explain the differences and similarities in the levels of engagement according to personality dimensions, and d) draw conclusions that may be generalized. The clinical utility of the NEO-Personality Inventory I-R based on the FFM has received increased empirical support as valid clinical assessment tool (e.g., Costa, 2008; Widiger & Trull, 2007) and it is selected as one of the basic tools for the first quantitative phase of this study. Employing a multi-method design based on a set of personality assessments allows the identification of different personality dimensions and their presentation in a continuum of severity and intensity, indicating the diversity of personality structures across combinations of measures (Ball, 2005; Svrakic et al., 2002).

4.1.1 Sample description and recruitment

4.1.1.1 Treatment services included in the study

The treatment centres that were involved in the study represent major publicly funded treatment facilities that provide comprehensive care for alcohol and substance misuse. The main reasons for the selection of the specific treatment services was that they provide free of charge, comprehensive psychosocial care for alcohol and substance misuse and have the largest number of individuals seeking therapy in Greece, jointly covering more than 80% of the treatment demand (EKTPEN, 2015). In order to obtain the most representative sample, the treatment units were selected according to their geographical location (Athens, Piraeus, Salamina, Thessaloniki).

The first treatment organisation (Tx1), KETHEA, is a non-profit, non-governmental organisation that has provided comprehensive treatment services since 1987 and consists of a nation-wide network of therapeutic community services. Types of treatment provided include long-term residential inpatient treatment, outpatient treatment, individual and group counselling, family therapy and social reintegration. Additionally, KETHEA offers in-residence work as therapy, peer support, vocational training, gradual reintegration into society and employment. Treatment staff include counsellors – a combination of former service users, social workers and psychologists. Outpatient treatment programmes include group and individual counselling, individual psychotherapy, and brief therapy problem solving techniques. The length of the treatment including outpatient and inpatient phases is usually 6 to 12 months and counselling sessions are scheduled about twice per week. Two inpatient TCs and two outpatient preparation units, which have the aim of preparing clients for inpatient treatment, participated in this study. Of the two inpatient TCs, one is located in Athens (south Greece) with total capacity of 60 beds and the second in Thessaloniki (northern

Greece) with total capacity of 40 beds. The overall number of staff employed is around 16 in both units.

The second type of treatment included in the study (Tx2) refers to psychosocial residential rehabilitation, an organisation called 18 ANO. The main department is based in the Attica Psychiatric Hospital. Treatment staff include psychologists, psychotherapists and social workers. Types of therapies include long-term inpatient and outpatient treatment, and individual and group counselling. Due to the smaller residential capacity compered to the TCs, for this type of treatment three inpatient and five outpatient units located in the Attica area were involved. The overall capacity is around 50 beds, with approximately 12 staff members.

The treatment entry procedure for accessing inpatient treatment in both organizations (Tx1 and Tx2) involves a preparation phase, within which individuals initially receive outpatient support therapy once per week. In both treatment types, after two weeks of individual counselling, clients engage in a more intensive format, including group therapy and individual sessions. The duration of the preparation phase is approximately the same for both treatments - ranging from 6 weeks to 12 weeks prior to inpatient treatment entry, with the main residential phase of therapy lasting approximately 6-9 months.

4.1.1.2 Recruitment of services and participants

The first part of this section describes the strategies employed for service recruitment. In the second part, inclusion and exclusion criteria that were applied for the recruitment of clients are presented. Figure 3 (p. 82) provides an overview of the overall recruitment process including information about the number of participants at each recruitment stage.

A series of meetings with the representatives of both treatment organizations was conducted, before an official presentation of the study to the IRB of each organization (see Appendix IV). Separate brief presentations were subsequently held in each treatment unit during supervision meetings of the clinical staff. During these meetings, we discussed and resolved a number of practical issues, i.e. time of assessment, approach and recruitment of the participants and ethical considerations. Following the IRB presentation and the evaluation of the study protocol (see Appendix IV), ethics approval letters were obtained from both organizations, allowing the research to take place in their units. All potential participants were approached individually by the researcher in the treatment facilities and were invited to participate in both written and verbal manner. Those who expressed interest and met the inclusion criteria received the related documents including the Brief Study Information Sheet and the Informed Consent Form. Only those participants who read and signed the consent form were included in the research.

As mentioned, these two types of treatment involve different philosophy, treatment interventions and policies. These services therefore needed to be approached in a different manner. The first treatment type KETHEA was approached by the researcher and a meeting was arranged with the director of the KETHEA research department where a brief overview of the research and the Access Approval Form was presented. Following the overall approval, a panel presentation before the executive board of directors was performed, including discussion on the purpose and aims of the research, scope, sample and time schedule of the recruitment period. Following this meeting, permission to access the TCs was acquired. Subsequently, in order to gain access into the specific TCs, the research was presented to each executive director of these units.

The representatives of each potential community centre were given an information sheet (see Appendix IV) containing a brief overview of the research, the researcher's relevant background and the access request form. After they had read the material, they were given the opportunity to ask any questions about the research and a number of practical issues were discussed. Executive directors of the specific TCs were also given the copies of the questionnaires that were used in the research for the service users. Once all related queries were explored, they consented to participate by signing the relevant documents (Service Consent Form, see Appendix IV). By signing the consent forms, they agreed to take part in the study and to allow the researcher to administer the defined instruments at outpatient preparation phase and the inpatient treatment.

The second type of treatment, namely 18ANO, was also approached directly by the researcher. The purpose and aims of the research were briefly presented to the executive director of the treatment. Following the discussion regarding the procedure of the research, sample and instruments, the researcher was informed about the specific policies of the centre related to access and confidentiality issues. The second step was the presentation of the research in a written form (information sheet) that included more detailed information regarding the scope, method, procedure and materials that will be used. This was presented before the panel of directors of the inpatient and outpatient treatment facilities. In accordance with the conditions agreed, permission to access the outpatient and inpatient facilities was obtained.

One of the major challenges of the recruitment process referred to the economic recession in Greece which affected treatment providers' capacity to correspond to the treatment demands, as they were facing severe budget cuts. This created an atmosphere

of intense insecurity, disorganization and difficulty to follow research protocols. At the same time, the Organization Against Drugs (OKANA), the main provider of Opioid Substitution Treatment (OST), adopted new drug policies related to the administration of methadone in primary care settings. This reduced significantly the number of individuals seeking psychosocial treatment, consequently decreasing the expected sample size of the study. As expected, this also influenced the pre-and during process follow-up assessment as the number of individuals with complete data from both assessment points was significantly reduced. The capacity to capture cases on a pre-during process design is a common weakness and a considerable challenge in follow-up studies and especially in UD treatment that is marked by high drop out rates during treatment.

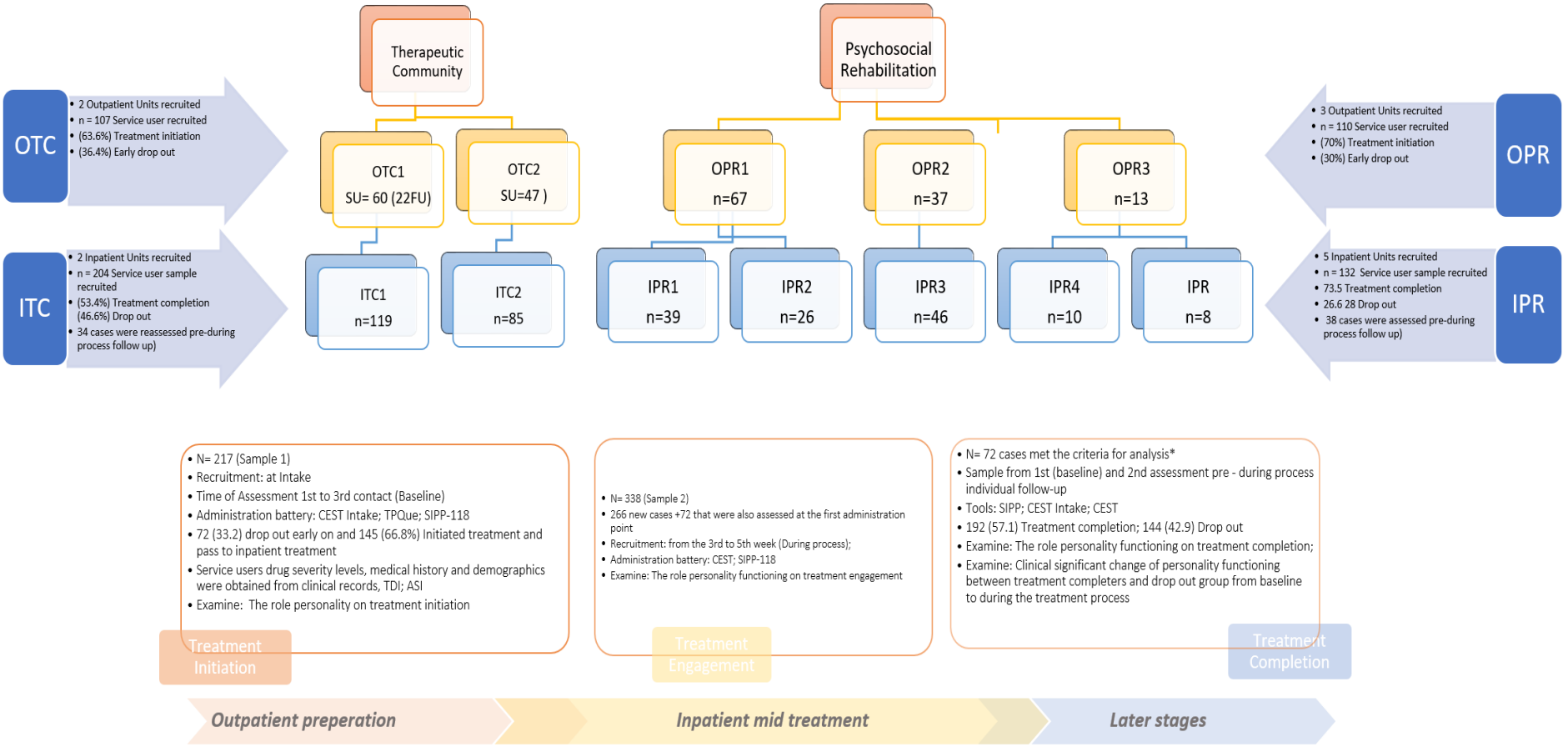
Some of my responses to these challenges were as follows: 1) I tried to be physically present in the treatment units as much as possible, in order to maintain contact, keep their interest in the research and commitment to the research protocols. One of biggest achievements was that I developed very positive relationships with the treatment providers, but also with front-line treatment staff. This created a climate of mutual cooperation, reduced the levels of resistance and tensions and more importantly contributed to the low levels of disagreement to participate in the study; 2) I made several amendments to the administration procedure, by nominating research coordinators within the units who were responsible of informing me about new groups of service users, gathering documents, reminding other treatment staff to provide information about the study and in some cases even print and organize all relevant materials to be ready for administration; 3) I established a network with the treatment providers that increased the level of commitment and participation; 4) I developed a plan for all units in order to meet treatment staff to present up-to-date interim evidence

on treatment engagement and drop out, and 5) finally, I extended the recruitment period from 12-16 months to 25 months, and switched my PhD registration to part-time.

4.1.1.3 Eligibility of service users

Inclusion and exclusion criteria

All individuals who sought treatment from the above-mentioned units (Sample 1: outpatient preparation treatment and Sample 2: inpatient treatment) in the period of twenty months, from summer 2011 - summer 2013 were considered potential participants. Individuals already enrolled in treatment in spring 2011 were not considered eligible. The eligibility criteria were the same for both samples and were as follows: 1) at least 18 years old, 2) have used illicit drugs during the past 90 days, 3) able to read and speak Greek fluently, 4) no current or previous experience of psychotic symptoms and 5) no serious developmental disabilities or cognitive disturbances. These conditions were verified on the basis of pre-screen data and information supplied by the treatment providers. Individuals' previous treatment experiences or additional diagnosis other than those mentioned above were not a reason for exclusion.



Keys: TC = Therapeutic Community; PR = Psychosocial Rehabilitation; OTC = Outpatient Therapeutic Community; OPR = Outpatient Psychosocial Rehabilitation; ITC = Inpatient Therapeutic Community; IPR = Inpatient Psychosocial Rehabilitation; SU = Service Users

*The criteria for inclusion in the pre-and during process follow up analysis were: completed the outpatient preparation phase, enrolled at the inpatient setting and have complete data from both assessment points including Outpatient (CEST Intake, SIPP-118 Intake) = and from Inpatient (CEST and SIPP-118 from inpatient assessment)

Figure 3. Recruitment of treatment and service users

4.1.1.4 Recruitment of service users

The recruitment of participants was conducted in two phases. The 1st phase involved only participants in the outpatient setting for the study Sample 1 the Outpatient Sample. These participants were recruited at treatment entry. The 2nd phase of the recruitment process involved participants who were recruited directly at the inpatient setting (n = 266) as well as participants who completed the outpatient preparation phase and enrolled at the inpatient treatment.Despite best efforts to capture those who were assessed at the first intake assessment, of the 145 individuals who completed the preparation phase, only 72 (49.6%) could be re-assessed at follow-up.

The reason for assessing a subsample with the same set of tools at two different times periods (the first assessment at treatment intake during the preperation phase and then follow up during the inpatient setting) was to compare their scores from baseline to mid treatment and assess potential changes. Only those who had complete data from both assessment points participated in the pre-and during process individual follow-up.

This allowed the examination of the potential effects of treatment on personality functioning as well as the degree of clinical significant change between those who completed inpatient treatment versus those who dropped out. Often in studies employing pre–during process designs, the clients who do not complete treatment are often replaced and their data are excluded from analyses, whether or not they have made clinically important change. This may provide misleadingly positive results, as a sub-population that is highly motivated to complete treatment may significantly influence the study findings.

In this study, the 72 cases that were assessed during both assessment points were included in the analysis at the outpatient phase examining personality functioning and treatment initiation. They were also included in the analyses of the inpatient sample (N=266) testing the relationship between personality functioning and treatment engagement and completion. Finally, this sample was then involved in a separate analysis examining their change scores in order to assess clinical significant change of personality functioning during treatment.

The study design, adopting a sequential treatment process evaluation of treatment initiation, engagement, completion and assessing potential change in personality during treatment, made use of the data gained from all service users, including the non-completers at each stage. For example, the comparison between completers and non-completers was made possible by the repeated administration of the SIPP-118, in order to assess personality functioning and the improvement achieved by non-completers as well. Second, by adopting the criteria of reliable and clinically significant change, the magnitude of the differences between the two groups of clients was made clear by capturing the outcomes of each *individual case*. This is in contrast to the standard inferential statistics adopted in the previous steps that do not provide full information on differences between comparison groups, as they are based on *group averages*.

4.1.1.5 Sample size calculations

It was planned to recruit a sample of approximately 150 from the outpatient preparation phase and 150 from the inpatient treatment. However, due to high attrition rates noted in early substance misuse treatment (ratio 1/3 drop out the first two weeks), as well as the fact the the study design involved pre- and during process individual follow up, it was decided to overrecruit as a preventive measure. Therefore, the final sample reached 217 participants from the outpatient and 338 participants from the inpatient treatment.

From both recruitment phases the consent for participation of service users was very high, reaching the 98%. This may have resulted from the collaboration with the clinical staff and the support they provided, as well as the positive way of presenting the study to service users. Figure 4 provides an outline of all assessment points of the Study.

Figure 4. Procedure and assessment points

4.1.2 Assessment procedure

4.1.2.1 Assessors Competency, Training and Supervision

The implementation of the standard intake assessment procedure was conducted by this author, supervised by two faculty members Professor Meier and Dr Kalyva. To this end, for the scheduled assessments three PhD student volunteers were recruited, trained and supervised. Their role was to explain what the study about, that the participation was completely voluntary and to administer the questionnaires in a group format. Also, they were present in order to assist service users in case they had any queries or couldn't understand the questions.

The author is trained in administration and scoring of various psychological assessments (as prerequisite University module of M.A in Clinical Psychology), as well as specialized as an addiction counsellor and certified by the International Board of Reciprocity Consortium. Additionally, the author has several years of experience of working in substance misuse treatment and coordinating clinical staff. All members of the assessment team had previous experience in working with substance misuse population, psychology degree, and training in basic counselling skills, ethics, and clinical psychopathology. Additionally, structured explanatory and thorough training was conducted to all volunteers covering theoretical background, approach to the participants and administration and scoring of the assessments.

4.1.2.2 Pilot assessment procedure

In order to examine the administration process and check for potential obstacles, pilot assessments were conducted in both organizations. This process provided valuable feedback for specific adjustments concerning the time of administration, corrections, explanation of the study as well as the order and sequence of the assessment battery. Moreover, throughout the process it became clear that different units had different

organizational structures and assessment procedures were adjusted accordingly. For example, in the outpatient unit in Athens, the 'take home approach' appeared to work best. The participants were informed about the study and explained relevant information, and they were asked to complete the questionnaires at home, and bring them completed to the next appointment. In the units of the other organization however, a different approach was adopted, i.e. individuals who participated in the first preparation phase and consented to participate were asked to complete the assessment procedure with all questionnaires in a group format whilst attending the unit. Despite these minor differences in the assessment procedure, it is not anticipated that this would influence the service users' responses to the questions.

4.1.2.3 Intake Assessment procedure (Study part 1)

During the initial assessment, baseline data was collected from Sample 1 participants in the outpatient preparation phase, in order to adequately describe treatment populations and gain data on clients' overall problem severity. Due to the sensitivity of the initial period in substance misuse treatment, pre-screen data for the potential participants were gathered from treatment services, including medical data and ASI (McLellan et al., 1992). The intake assessment battery was then conducted during the first appointments (1^{st} to 3^{rd} week, one appointment per week) of the individual with the treatment services and included the CEST Intake (CEST-I; Simpson, 2001;2005). The SIPP-118 (Verheul et al., 2008), while TPQ (Tsaousis, 2002) was given at the next appointment. The timing of the assessment was very important at this phase and it was decided in accordance with the literature and clinical practice in the relevant services.

As both problem severity measured by CEST-I and (mal)adaptive personality functioning measured by SIPP-118 are malleable to change during treatment, it was

considered appropriate to capture these dimensional indicators early on. However, very early administration generates several ethical and procedural challenges. First, this phase is characterised by high premature drop-out presenting common obstacles in naturalistic research settings (e.g. Joe et al., 1999; Simpson et al., 1997), and second, research participation may present potential burden for the individuals in the initial phase of therapy. Therefore, utilization of an assessment battery that is not too lengthy, but allows collection of comprehensive data, as well as the selected timing, was deployed in an attempt to achieve the appropriate balance among ethical, clinical and scientific considerations.

The assessment team was notified by clinical staff when new clients sought treatment. Following the brief description of the study and the study info sheet, only those who signed the consent form participated in the assessment process. As described above, in some treatment units, the administration procedure was utilized in a group format and involved completing all questionnaires on the same day, whereas in others, one to one interview was conducted and the participant had to bring back the questionnaires at the second appointment with the treatment (Take home procedure) Any assessments taking place in treatment facilities were conducted in a quiet room previously arranged with treatment providers.

Although all assessments are self-reported, the assessment team was present until the end of the administration process in order to provide necessary instructions and ensure the appropriate procedure. The approximate time required for completion of the first assessment battery was 45 – 75 minutes, while TPQue required 30 minutes. In all phases of the administration procedures, the researcher or the assessment team had follow up discussions with the participants to explore for any potential problems that

could arise from the questions such as emotional overload or inconvenience. Especially for the Take home procedure, all the questionnaires were reviewed together with the participants to explore potential misunderstandings or queries they may have had.

4.1.2.4 During treatment assessment procedure (Study part 2)

The second administration process was performed in the inpatient setting at the early phase. According to the literature, this period is between the 2nd and 4th week of inpatient treatment for sample 2. Based on the eligibility criteria, the administration process involved all individuals enrolled at the inpatient treatment units including those who participated at the first intake assessment process. The administration took place in a private location in treatment in individual or group format. It was scheduled to administer CEST and SIPP-118 prior to group therapy or right after the group therapy. The assessment team was available to assist participants with the completion of the questionnaires or discuss potential issues. However, in order to avoid compromising confidentiality, participants had complete privacy to consider their answers.

4.1.3 Measurements

4.1.3.1 Pre-treatment characteristics

Demographic and Clinical Information

In addition to the central study variables explained analytically below, demographic and clinical variables were included as control variables and for sample description purposes, as recommended by the literature. Client age and sex were included as control variables in the study. Other demographic and clinical information was collected for descriptive purposes: marital status, level of education, current employment status, primary and secondary drug of choice, frequency of drug use and route of drug administration. Clinical data were collected by the treatment services prior

to the study assessments and included Treatment Demand Indicator and ASI scores, which were recorded from the clients' notes, so it did not involve additional assessment burden for the clients. The Table 3 and Table 4 indicate each measurement used with the variables, the sample to which measurements were administered and for which hypothesis.

Treatment Demand Indicator (TDI)

The objective of the Treatment Demand Indicator (Simon et al., 1999) is to define the minimum data set (the core item list) which national treatment-monitoring systems should be able to provide about each individual admitted to treatment and relevant data kept in an electronic format. The assessment includes variables relevant to this study, namely educational level (0= few classes of primary school to 10= graduate university; advance university degree); employment (1= currently unemployed to 8= student). For drug frequency, service user had a choice on a scale 1= everyday use to 5=once per week. Service users rated the level of their current support needs (0=not at all to 3=a lot), levels of family/social problems in the past 30 days and to what extent they required help for such difficulties (0=not at all to 4=extremely). Other pre-treatment variables that were gathered from TDI include drug related information and general functioning (please see Table 5, page 111).

Addiction Severity Index (ASI)

Addiction Severity Index (ASI) (McLellan et al., 1992) is a widely used instrument which screens for problems and impairments commonly related to drug misuse and dependence. The Greek version of ASI was translated into Greek language and standardized by the University Research Institute of Mental Health (Kokkevi & Hartgers, 1995). This instrument contains 164 items in seven categories in which the

assessed problems are organized, such as: a) medical status, b) employment status, c) alcohol use, d) drug use, e) legal status, f) family/social relationships, and g) psychological status. Each of the issues is assessed through a clear distinction regarding problems that have been experienced in the past 30 days or at some point of the individuals' lifespan. Furthermore, for each of the categories, clients have the opportunity to express the degree to which they perceive the issue as problematic for them (e.g. extremely problematic, considerably, moderately, slightly or not at all).

The psychometric properties of ASI have received extensive support (e.g. Alterman et al., 2001; McLellan et al., 1992). Several studies demonstrated good to excellent reliability and validity (e.g. Butler et al., 2001; Zanis, McLellan, & Corse, 1997). Summarising studies in multiple patient groups, Mäkelä (2004) reported sound reliability of composite scores. In particular, three of the seven ASI domains (medical conditions, use of alcohol, and psychiatric disorders) had high internal consistency across studies, while others were more variable. ASI was used to gather descriptive pre - treatment information for the individuals who participated in the study, including medical data, alcohol and drug use, legal status and family/social relationships.

Client Evaluation of Self and Treatment Intake (CEST-I)

Client Evaluation of Self and Treatment (CEST; Simpson, 2001;2005) and CEST Intake are self-completion questionnaires developed by the Texas Christian University. CEST Intake consists of three domains: a) psychological functioning (4 scales), b) social functioning (3 scales) and c) treatment motivation (4 scales). On the CEST, scores above 30 are considered problematic. CEST-Intake was administered to the outpatient

preparation phase sample at the intake assessment in order to examine Hypothesis 1 about treatment initiation.

Psychological and Social functioning

Twenty-one items from the psychological/social functioning domains of the CEST Intake/ CEST were used to assess psychological dysfunction. Items were rated on a 5-point Likert type scale ranging from 1= "Strongly Disagree" to 5= "Strongly Agree" pertaining to symptoms relative to psychological or social problem. Higher scores indicate higher level of psychological dysfunction on the particular psychological problem being measured (Simpson, 2001; 2005). For this study, the current levels of psychological functioning were assessed through scales for *Depression* and *Anxiety* (coefficient alphas of .67 and .74, respectively). Sample items for the anxiety scale included "You feel anxious or nervous," "You have trouble sleeping," and "You have trouble sitting still for long." In addition to these measures of psychological symptoms, general feelings of *Self-efficacy* and *Self -esteem* were also assessed (coefficient alpha = .72 and 68, respectively). Service users indicated their agreement with statements such as "You have little control over the things that happen to you" and "There is little you can do to change many of the important things in your life."

Social functioning indicators were comprised of scales for *Hostility*, *Risk-taking*, and *Childhood problems* (coefficient alphas ranged from 74 to .79). Ratings for hostility were made on items like "You have urges to fight or hurt other," "You get mad at other people easily," and "You like others to feel afraid of you."

Treatment motivation

To assess pre-treatment motivation levels, service users were asked to complete a questionnaire consisting of four motivational scales. The scales evaluated the following areas: level of *Problem Recognition, Desire for Help* and *Treatment Readiness* including an index for pressures for treatment. In accordance with the authors' scoring instructions (Simpson & Joe 1993), responses of each scale were averaged and then multiplied by 10 resulting in final scores ranging from 10 to 50 and a mid-point of 30. Higher scores represent higher levels of the assessed factors.

4.1.3.2 Personality assessments

Severity Indices of Personality Problems (SIPP-118)

The Severity Indices of Personality Problems 118 (SIPP-118; Verheul et al., 2008) is a dimensional self-report measure to assess the core components of personality pathology (or characteristic adaptations). The questionnaire was developed by Dutch and British clinical experts in the field of personality and personality disorders for research purposes and measurement of structural personality changes in treatment studies. The SIPP-118 asks the respondents to think about the past three months and to indicate the extent to which they agree with statements like 'I frequently say things I regret later' or 'Whenever I feel something, I can almost always name that feeling'. The response categories range from 1-4 and are described as 'fully disagree', 'partly disagree', 'partly agree', or 'fully agree'. The measure comprises 16 facets; these facets are clustered into five higher-order domains named Social Concordance, Relational functioning, Self-control, Responsibility, and Identity Integration. High scores in the facets indicate better

adaptive functioning, whereas lower scores represent more maladaptive personality functioning.

A series of studies including 2,730 participants (individuals with personality disorders, psychiatric outpatients and a non-clinical sample) was conducted to test the development and validity of the SIPP-118 (Verheul et al., 2008; Feenstra, Hutsebaut, Verheul, & Busschbach, 2011). The results indicated that the 16 facets are homogenous item clusters that fit well into clinically interpretable higher order domains. Each facet consists of 7 or 8 items, with a 0-4-point response scale and scores are expressed as average item levels ranging from least adaptive (1) to most adaptive (4). The SIPP-118 five broad domains pose strong concurrent, convergent and discriminant validity. Furthermore, the domains are fairly stable and insensitive to short-term state changes, but sensitive to long-term adaptation changes, and therefore, effective in measuring (mal)adaptive personality functioning. The instrument has been translated into seven languages and is currently under assessment by several researchers (e.g. Arnevik, 2009).

The SIPP-118 aims to measure an individual's levels of adaptive capacities at a given time, and can indicate in which areas of personality functioning treatment is needed and which areas are adaptive and resourceful (Verheul et al., 2008). Furthermore, the SIPP-118 can be used as a measure of change due to treatment, indicating which capacities have improved and become more adaptive (Verheul et al., 2008). The SIPP-118 has currently been tested with five samples. In the initial validity study of the SIPP-118, personality problems were assessed in a Dutch PD sample (N=555) and a Dutch non-clinical population sample (N=478) (Andrea et al., 2007). Personality problems in a Norwegian PD sample (N=114) were assessed in the Ullevål Personality Project

(Arnevik et al., 2009). The SIPP-118 has also been tested with a clinical and a non-clinical adolescent sample (Feenstra, Hutsebaut, Verheul, & Busschbach, 2011).

The SIPP-118 was translated into the Greek language for the purpose of the study. Again, all the necessary steps were taken for the appropriate translation procedure, as explained earlier. Cronbach's alpha was utilized to investigate the internal consistency of the facets of the SIPP-118 (see Table 1). In this study, the alpha coefficients ranged between .65-.70, indicates low to moderate reliability and coefficients ranging from .68 to .89 indicate moderate to acceptable reliability (see Table 1). The results for this study were: a) *Self-control*, including the facets of *Emotion regulation* .76 and *Effortful control* .71, b) *Identity integration*, including the facets of *Self-respect* .78 , *Stable self-image* .79, *Self-reflexive functioning* .79, *Enjoyment* .74, and *Purposefulness* .72, c) *Relational capacities*, including the facets of *Intimacy* .80, *Enduring relationships* .78, and *Feeling recognized* .76, d) *Responsibility*, including the facets of *Trustworthiness* .76 and *Responsible industry* .72, e) *Social concordance*, including the facets of *Aggression regulation* .88, *Frustration tolerance* .73, *Respect* .68 and *Cooperation* .78. SIPP -118 was used in both assessment points. First, SIPP-118 was administered at the intake assessment to the outpatient preparation phase sample in order to examine Hypothesis 1. Then SIPP-118 was re-administered at the second administration during treatment process to examine Hypothesis 3 on the Sample 2.

Table 1. SIPP-118 facet reliability from current sample and Dutch populations with substance use disorder, personality pathology and general population

Facets	Number of Items	Cronbach's alpha		
		Current Study sample (n=205)	Verheul et al., 2008; Dutch PD sample (n=1208)	Verheul et al., 2008 ; Dutch adult general population sample

				(n=478)
Emotion regulation	7	.76	.79	.82
Effortful control	7	.71	.80	.72
Self-respect	8	.79	.83	.83
Stable self-image	7	.79	.77	.82
Self-reflexive functioning	7	.75	.75	.81
Enjoyment	7	.74	.77	.79
Purposefulness	7	.72	.76	.74
Intimacy	7	.80	.81	.83
Enduring relationships	7	.78	.75	.75
Feeling recognized	8	.76	.76	.80
Aggression regulation	8	.88	.84	.87
Frustration tolerance	8	.73	.73	.78
Cooperation	8	.78	.78	.76
Respect	7	.68	.69	.65
Responsible industry	7	.72	.76	.68
Trustworthiness	8	.76	.76	.69

Table 2. SIPP-118: Mean facet scores of patients with substance use disorder, personality pathology and general population

Facets	Study SUD sample (n=205) M (SD)	Andrea et al., 2007; sample 2 (n=555) PD M (SD)	Andrea et al., 2007 sample 3 (n=478) General population M (SD)
Emotion regulation	2,36 (0.61)	2.44 (0.69)	3.30 (0.61)
Effortful control	2,14 (0.53)	2.53 (0.70)	3.16 (0.56)
Self-respect	2.81 (0.60)	2.36 (0.67)	3.30 (0.59)
Stable self-image	2,47 (0.65)	2.21 (0.66)	3.24 (0.67)
Self-reflexive functioning	2.52 (0.54)	2.51 (0.57)	3.20 (0.56)
Enjoyment	2.37 (0.60)	2.32 (0.64)	3.34 (0.62)
Purposefulness	2.68 (0,58)	2.42 (0.64)	3.34 (0.49)
Responsible industry	2.42 (0.59)	2.87 (0.67)	3.44 (0.50)
Trustworthiness	2.57 (0.56)	3.04 (0.61)	3.49 (0.42)
Intimacy	2.71 (0.55)	2.68 (0.69)	3.17 (0.60)
Enduring relationships	2.75 (0.60)	2.47 (0.67)	3.31 (0.58)

Feeling recognized	2,63 (0.59)	2.63 (0.62)	3.23 (0.56)
Aggression regulation	2,80 (0.75)	3.30 (0.73)	3.66 (0.45)
Frustration tolerance	2,42 (0.51)	2.24 (0.56)	2.96 (0.56)
Cooperation	2.94 (0.59)	2.84 (0.58)	3.28 (0.51)
Respect	2,98 (0.51)	3.14 (0.53)	3.34 (0.45)

Traits Personality Questionnaire (TPQue)

The TPQue (Tsaousis, 2002) was developed in accordance with the theoretical framework of the Five Factor Model and embodies the Greek version of the NEO-PI-R. The NEO PI-R measures normal personality traits and has been translated into several languages and used in more than 50 cultures. The clinical utility of the NEO-Personality Inventory I-R based on the FFM receives increased empirical support as valid clinical assessment tool (e.g., Costa, 2008; Widiger & Trull, 2007 and it is selected as one of the basic tools for the first quantitative phase of this study. The NEO scales have high levels of internal consistency and strong discriminant and convergent validity characteristics (Costa & McCrae, 1992).

TPQue consists of 206 items measuring the five basic personality dimensions (*Neuroticism, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience*), simultaneously considering specific ethnic and cultural characteristics of the Greek population. Each dimension has six facets corresponding to dominant traits of each dimension. Each of the factors consists of 36 items, while each facet consists of six items. TPQue also includes two independent scales (26 items) measuring social desirability and lying responses. Item responses are recorded on a 5-point scale ranging from strongly disagree (1) to strongly agree (5). The reliability and validity of the TPQue and the existence of the Big Five in Greek language has been supported by the psychometric evidence with test internal validity–factor structure, content and construct

validity, internal and temporal stability (Tsaousis & Semkou, 1999). TPQue factor scales have coefficient alphas ranging from .78 to .89. A number of tests during the development involved over 1000 students recruited nationwide. To date, TPQue has been used in a number of settings, such as counselling and clinical assessment (Tsaousis & Semkou, 1999), personnel selection and appraisal (Nikolaou & Robertson, 1999; Tsaousis & Nikolaou, 2001) and job satisfaction (Furnham et al., 2002). TPQue was administered at the intake assessment with the outpatient preparation phase sample in order to examine Hypothesis 1. Employing a multi-method design based on a set of personality assessments allows the identification of different personality dimensions and their presentation in a continuum of severity and intensity, indicating the diversity of personality structures across combinations of measures (Ball, 2005; Svrakic et al., 2002).

4.1.3.3 Treatment engagement

Client Evaluation of Self and Treatment (CEST)

In addition to the CEST-Intake, the CEST includes treatment engagement subscales related to treatment satisfaction (7 items), counselling rapport (14 items), (3) treatment participation (12-items), as well as scales on peer support (5 items) and social support (9 items). Item examples are: "I am satisfied with this programme" (treatment satisfaction), "I trust my counsellor" (counselling rapport), and "I am following my counsellor's guidance" (treatment participation). Items are rated on a 5-point Likert type scale ranging from 1= "Strongly Disagree" to 5= "Strongly Agree". Scores for each of the subscales are obtained by summing responses to the set of items (after reversing scores on reflected items by subtracting the item response from "6"), dividing the sum by number of items included (yielding an average) and multiplying by 10 in order to rescale final scores so they range from 10 to 50 (e.g., an average response of 2.6 for a scale becomes a score of "26") (TCU, 2005). Higher scores indicate more confidence in

the particular factor being measured. Scores above 40 are considered high treatment scores.

The psychometric properties of CEST have been tested in the TCU National Sample including 1700 clients from 87 programmes from a US sample and the reliability and validity of these scales have been confirmed with subscale coefficient alpha ranging from .86 to .96 (Joe et al., 2002). For the purposes of the study, both questionnaires CEST-Intake and CEST were translated into Greek language following the appropriate translation procedures i.e. back translation, professional assistance by an expert in the field and consultation by Greek – English professional translator. CEST-Intake was administered at the first assessment period during the outpatient preparation phase to examine Hypothesis 1, and CEST was administered during the second assessment during inpatient setting to examine Hypothesis 3.

Table 3. Variables and measurements of the study

Pre-treatment Characteristics				
Variable	**Instrument**	**Level of Measurement**	**Sample**	**Data obtained**
Socio-demographic information				
Age	TDI	Continuous	Sample 1 & 2	Clinical records
Gender	TDI	Categorical	Sample 1 & 2	Clinical records
Living status (with whom)	TDI	Categorical	Sample 1 & 2	Clinical records
Nationality	TDI	Categorical	Sample 1 & 2	Clinical records
Labour status	TDI	Categorical	Sample 1 & 2	Clinical records
High educational level	TDI	Categorical	Sample 1 & 2	Clinical records
Marital Status	TDI	Categorical	Sample 1 & 2	Clinical records
Variable	**Instrument**	**Le of Measurement**	**Sample**	**Data obtained**
Drug-related information				
Primary drug	TDI	Categorical	Sample 1 & 2	Clinical records
Route of admin (pri drug)	TDI	Categorical	Sample 1 & 2	Clinical records
Secondary drug	TDI	Categorical	Sample 1 & 2	Clinical records
Route of admin (secon drug)	TDI	Categorical	Sample 1 & 2	Clinical records
Freq of use (prim drug)	TDI	Categorical	Sample 1 & 2	Clinical records
Freq of use (secon drug)	TDI	Categorical	Sample 1 & 2	Clinical records
Ever injected/currently (last 30 days) injecting	TDI	Categorical	Sample 1 & 2	Clinical records

General Functioning				
Medical Composite Score	ASI	Continuous	Sample 1 & 2	Clinical records
Employment Composite	ASI	Continuous	Sample 1 & 2	Clinical records
Alcohol Composite Score	ASI	Continuous	Sample 1 & 2	Clinical records
Legal Composite Score	ASI	Continuous	Sample 1 & 2	Clinical records
Family/Social Composite Score	ASI	Continuous	Sample 1 & 2	Clinical records
Treatment motivation				
Problem Recognition	CEST-Int/CEST	Continuous	Sample 1 & 2	Self-report
Desire For Help	CEST-Int/CEST	Continuous	Sample 1 & 2	Self-report
Treatment Readiness	CEST-Int/CEST	Continuous	Sample 1 & 2	Self-report
Pressures for Treatment	CEST-Int/CEST	Continuous	Sample 1 & 2	Self-report
Variable	**Instrument**	**Level of Measurement**	**Sample**	**Data obtained**
Psychological functioning				
Self Esteem	CEST-Int/CEST	Continuous	Sample 1 & 2	Self-report
Depression	CEST-Int/CEST	Continuous	Sample 1 & 2	Self-report
Anxiety	CEST-Int/CEST	Continuous	Sample 1 & 2	Self-report
Self-Efficacy	CEST-Int/CEST	Continuous	Sample 1 & 2	Self-report
Social functioning				
Childhood Problems	CEST-Int/CEST	Continuous	Sample 1 & 2	Self-report
Hostility	CEST-Int/CEST	Continuous	Sample 1 & 2	Self-report
Risk Taking	CEST-Int/CEST	Continuous	Sample 1 & 2	Self-report
Treatment engagement				
Treatment Satisfaction	CEST	Continuous	Sample 2	Self-report
Counseling Rapport	CEST	Continuous	Sample 2	Self-report
Treatment Participation	CEST	Continuous	Sample 2	Self-report
Variable	**Instrument**	**Level of Measurement**	**Sample**	**Data obtained**
Personality traits				
Extraversion	TPQue	Continuous	Sample 1	Self-report
Neuroticism	TPQue	Continuous	Sample 1	Self-report
Openness	TPQue	Continuous	Sample 1	Self-report
Conscientiousness	TPQue	Continuous	Sample 1	Self-report
Agreeableness	TPQue	Continuous	Sample 1	Self-report
Characteristic adaptations				
Self-control	SIPP-118	Continuous	Sample 1 & 2	Self-report
Identity integration	SIPP-118	Continuous	Sample 1 & 2	Self-report
Relational Capacities	SIPP-118	Continuous	Sample 1 & 2	Self-report
Responsibility	SIPP-118	Continuous	Sample 1 & 2	Self-report
Social concordance	SIPP-118	Continuous	Sample 1 & 2	Self-report

Table 4. Measurements administered in the study of each research hypothesis

Instrument	CEST Intake	CEST	TPQue	SIPP-118
Author	Simpson, 2001;2005	Simpson, 2001;2005	Tsaousis, 2002	Verheul et al., 2008

Constructs measured	Treatment motivation Psychological functioning Social functioning	Motivation Alliance Participation Satisfaction	Extraversion Neuroticism Openness *Conscientiousness* Agreeableness	Self-control Identity integration Relational Capacities Responsibility Social concordance
Length in minutes	15	25	30	30
Cr Alphas	.86 to .96	.86 to .96	.78 to .89	.68 to .86
Previously used with SU tx	Yes	Yes	Yes	No
Pre-study Greek version available	No	No	Yes	No
Hypothesis number	1	2, 3	2, 3	1, 3

4.2 Analysis techniques

This section initially describes strategies of quality assurance after data entry into the SPSS (version 20). This is followed by an overview of the statistical techniques employed for testing the hypotheses of the current study. The analysis follows a stepwise examination of service users' treatment journey, from treatment initiation to early treatment engagement and finally, treatment completion. It also explores the clinical change of characteristic adaptations from baseline to during process follow up between the treatment completion and drop out groups.

4.2.1 Quality assurance

Several quality checks were conducted within the SPSS 20 but also through the unified database framework developed for the needs of this study. Identified errors were also found including logic checks, missing data and identified errors through double entry (random ten percent of database), descriptive statistics (to check for coding errors and bivariate outliers) and scatterplots (to check for expected associations between

variables and multivariate outliers). Coding that was unidentified or missing was cross-checked with the treatment units in an attempt to arrive at a correct entry prior to analysis.

4.2.2 Rationale for the selection of analysis and analytic strategies Statistical analysis plan (Study part 1)

Data analysis was conducted using the statistical software SPSS 20. Descriptive statistics analysis was performed to present the distribution of the sample's demographic and key study variables. Initially, all variables were examined individually for missing values and, where appropriate, outliers. In order to test assumptions for the second part of the analyses, all predictors and criterion variables were tested for normality using kurtosis, skewness, Kolmogorov-Smirnov tests and the normal Q-Q Plot.

4.2.2.1 Univariate and multivariate analysis of baseline characteristics

Comparison between the treatment initiation and drop out group

The first phase of the analysis involved the outpatient sample. Service users were classified into two main groups, treatment initiation (completed the outpatient preparation phase) and dropouts (left treatment prematurely). Student's t-tests were employed to compare the means for the groups on continuous variables and chi-square analyses were used for categorical variables (employment, marital status, gender, ethnicity and drug use).

Predictors of treatment initiation (Testing of hypothesis 1)

To examine for the factors predicting treatment initiation, a univariable logistic regression analysis was conducted, with treatment initiation /dropout group as the dependent variable and the main client-related factors (i.e., gender, motivational levels, psychosocial functioning and personality traits) as the independent or predictor variables. Similar steps were taken to construct a multivariable logistic stepwise regression model for predicting treatment initiation from characteristic adaptations. Odds ratios and 95% confidence intervals (CI) are reported in the multivariable model. Based upon the significance level of each covariate within the model, those that contributed the least and had the lowest level of significance, were removed from the model one by one until the most parsimonious model with the strongest predictors remained (Hosmer & Lemeshow, 2000).

4.2.3 Statistical analysis plan for the Phase II

4.2.3.1 Univariate analyses

Control Variables and Demographic Information of the Phase II

In order to test assumptions for the regression equation all predictors and criterion variables were tested for normality using kurtosis, skewness, Kolmogorov-Smirnov tests and the normal Q-Q Plot. Furthermore, scatterplots were used to check for non- linearity and visualize the relationship between variables before using Pearson's correlation coefficients (r). The association between personality dimensions, characteristic adaptations and engagement indicators were calculated using Pearson (r) in order to determine associations. Conducting correlation coefficient with all the independent variables indicated inter-correlations among the predictors and identified multicollinearity issues that will assist the selection process in the multivariate model and remove any highly-correlated variables. Partial correlation coefficients of

personality dimensions and engagement were calculated after controlling age, gender and treatment site. The set of variables that demonstrated significant associations with engagement or personality dimensions formed the set of covariates for the prediction model (regression analysis).

4.2.3.2 Multiple linear regressions (Stepwise mode)

Personality dimensions as predictors of treatment engagement (Testing of hypothesis 2)

Multiple regression analyses allow for three major analytic strategies for the entry of covariates: simultaneous, sequential and stepwise. These methods use different approaches in terms of handling covariates' variability and selection of entry order (i.e. user-specified or based on statistical criteria, Tabachnick and Fidell, 2006). In the present study, the stepwise procedure was employed because of its advantage in maintaining power in a more effective way than simultaneous or sequential strategies. In stepwise regression, it only relies on the eventually selected predictors and not on the number of all initially entered covariates, which was particularly useful for the large number of potential predictors.

Construction of the multivariate model

In order to examine the second Hypothesis a 2-stage analytic approach was used. For the first analytic step of the basic psychometric analyses a series of chi-square tests and t-tests was used to make simple comparisons between those who scored high from those who scored low engagement. The second step was to control for pre-existing baseline differences (i.e. age and gender) between those who do and do not engage, and run a series of logistic regressions to examine the relative impact of individual traits and characteristic adaptations on treatment engagement while adjusting for these differences. Initially, the regression analyses were used to assess what specific combination of

independent variables of the broad domains of characteristic adaptations best predicted treatment engagement (treatment satisfaction, counselling rapport, and treatment participation). Secondly, regression analyses were utilized to assess whether and to what extent, the independent variables at the facet level of characteristic adaptations predicted the engagement indictors.

In order to produce the best combination of predictors of the dependent variable and ensure for the independence of the observed effects of personality and any shared variability with the predictors of interest, a set of covariates were included in the first step for each model. In the second step, the five broad characteristic adaptations were entered as a single block. This approach allowed to determine whether the final predictors entered into the regression equation can explain a significant proportion of the variance in engagement levels while controlling for, or taking into account the impact of a different set of independent variables. Also, because characteristic adaptations have been found to be interrelated when considered concurrently, the regression equation can parse the shared variance among predictors and reveal the unique contribution of each broad domain.

Given that there is no previous research on the effects of most personality dimensions on the engagement indicators, it was considered to be justifiable to use these predictors as exploratory employing a stepwise selection technique. This offers the advantage to build more parsimonious models by limiting the amount of variables and producing the best subset of predictors of the criterion variables. The models were developed using the forward stepwise procedure where each variable was entered into the group of predictors and the relationship between the group of predictors and

dependent variables was reassessed, applying a "cut off" probability of $p = 0.10$ to stop the forward selection process.

4.2.3.3 Hierarchical multiple logistic regressions of characteristic **adaptations** *and treatment progress (Enter mode) (Testing of hypothesis 3)*

The third set of analyses looked at the degree to which variables significantly predicted treatment progress, that is treatment completion versus drop out from treatment. For these analyses, a logistic regression analysis was utilized, with treatment progress as the dependent variable. Motivational and treatment engagement variables were entered into the first block and the predictors of interest, the characteristic adaptations, into the second block. Variables significant in the initial (univariate) regression analyses were simultaneously entered into the final logistic regression model (enter method), designed to determine whether these predictors were independently associated with treatment drop-out above and beyond the engagement and motivational variables. Multicollinearity diagnostic statistics for the logistic model (tolerance values and VIF) were examined to exclude multicollinearity due to interdependency between the predictor variables. The classification accuracy of the final model was calculated

4.2.3.4 Within-group comparisons to assess the patterns of changes from base-line to follow-up. (Testing the hypothesis 4)

In order to examine whether there are any differences in the participants' characteristic adaptations maladjustment levels from the initial assessment compared with the during the process assessment, initial comparisons within groups (Paired –t test) were performed in order to estimate treatment response, i.e. whether significant changes had occurred from baseline outpatient to during process inpatient. In order to examine whether these differences vary according to the treatment status, a series of mixed between-within subjects analyses of variance was conducted to compare scores on the

characteristic adaptations between the treatment completers and drop out group across two time periods (outpatient baseline -Time 1; and inpatient during process - Time 2).

Determining reliable and clinically significant change (Testing of hypothesis 4)

Cut-off and reliable change index

In addition to statistically comparing the mean scores of completers and non-completers, the criteria of reliable and clinically significant change were applied (Jacobson & Truax, 1991) to assess the extent to which clinical change was associated with psychometrically reliable change that moved individuals from personality functioning scores in the clinical range to scores in the non-clinical range. In order to determine the clinically significant change for the different facets of the five broad characteristic adaptations domains, calculation of the percentage was conducted for service users who achieved reliable change, passed the cut-off point, and moved from a dysfunctional range to a normative range (Jacobson & Truax, 1991).

Reliable change was calculated using the formula: $RC = 1.96 \times \sqrt{2}(SE)2$, with $SE = SDclinical \times \sqrt{1 - \alpha}$ as suggested by Jacobson & Truax, 1991. A cut-off point for movement into a normative range was computed using the following formula: $(SDnormal \times Mclinical + SDclinical \times Mnormal)/(SDnormal + SDclinical)$. Clinical deterioration was also computed, defined as service users whose score decreased by the reliable change index.

4.3 Ethics and governance

The study received ethics approval from the City College, an affiliated institution of the University of Sheffield, in May 2011, Reference Number 090253115 (see Appendix IV). Since data collection involved clients undergoing substance misuse treatment, the study also needed approval by the Institutional Review Board (IRB) of the organizations involved in the study (see Appendix IV). These organizations are authorized by the Greek Ministry of Health to approve research conducted in their facilities.

4.3.1 Access Issues

The access related documents were submitted to the IRB and Treatment Unit Directors containing two separate forms. The *Information Sheet* provided relevant data regarding research title, purpose, scope and aims of the research and researchers' background. Research methodology, relevant procedures, assessment tools, as well as eligibility criteria for the participants, were also included. Finally, issues of privacy, confidentiality and dissemination of the research findings were addressed. The Information Sheet was accompanied by the Access Request Form and was submitted for approval. In order to inform potential participants, a short version of Study Information Sheet was developed. This document contained a brief overview of the research purpose and procedures and was provided to service users and the clinical staff.

Informed Consent

Prior to the initiation of the research, potential participants were informed about the purpose, aims and the voluntary nature of the study, as well as their right to not participate or withdraw consent at any time. They were also informed that the study was not related to the treatment services they receive and that any identifying data or

information they revealed would be confidential, protected and safely kept. As confidentiality may often be compromised in substance misuse treatment, participants were made aware that their responses on the questionnaires or revealed data were not shared with any of the staff members or other service users. Following these explanations, individuals were asked to carefully read the consent form and decide whether to sign it. The signed and dated informed consent forms were included in the records. The questionnaires were administered only after signed and dated informed consents were received.

4.3.2 Confidentiality

In order to protect participants' confidentiality, they are referred to by pseudonyms and all identifying data are altered, protected and safely kept. Research related forms were not shared with unauthorised individuals outside the research team and following the finalization of the study will be archived in a locked cabinet for five years following PhD completion and then destroyed. Any data, written or oral, remained confidential except in few legally stipulated cases noted in the Study Info Sheet.

CHAPTER 5: RESULTS

5.1 Overview

This chapter details the findings from the analyses of data collected in the first part of the study of the n = 217 outpatient sample from the preparation phase and in the second part of the study with n = 338 inpatient sample participants. The first section includes a summary of the demographic characteristics in the two assessment periods; the baseline outpatient sample and during process follow up inpatient sample are followed by a presentation of bivariate and multivariable findings related to the research questions and the four hypotheses that guided the study (see the Current Study, Chapter 3).

More specifically, following the descriptive information, group differences between service users who initiated treatment and those who dropped out early on are described, along with their significant differences on personality traits and characteristic adaptations. Comparative analyses were performed to determine how service users who initiated treatment (completed the outpatient treatment phase) differ from those who dropped out prematurely on identified pre-treatment variables (research question 1). A logistic stepwise regression was utilized to examine any significant differences on both personality traits and characteristic adaptations between the two groups. The second set of analyses examined the relative impact of characteristic adaptations on treatment engagement, utilizing a series of multivariable regression analyses. The third set of analyses looked at the degree to which variables that significantly differed between the treatment completers and dropouts in univariate analyses predicted treatment drop-out in

multivariate analyses. For these analyses, a hierarchical logistic regression analysis was utilized, with treatment initiation as the dependent variable.

In the next step, in order to examine whether there were any significant differences regarding the degree of changes of characteristic adaptations between the two groups (completers and drop-outs) a series of mixed between-within subject analyses of variance were conducted across the two-time periods. Finally, in order to investigate whether these changes are meaningful in clinical terms, the criterion of reliable and clinically significant change (Jacobson & Truax, 1991) was applied to assess the extent to which the improvement was associated with psychometrically reliable change that moved service users from a dysfunctional range to a normative range.5.2

5.1.1 Sample socio-demographics and substance use patterns

Outpatient Sample (N=217): The average age of the outpatient sample was 33.70 years (SD = 6.27, range 20-61) (see Table 1). Consistent with the population of the treatment centres, the majority of participants were males (87.3 %, n = 186), single (65.9%, n = 120) and graduated high school (34.6%, n = 63). Three-quarters of the participants reported that they were unemployed (74.2%, n = 135), more than half had some type of legal problems (59.85%, n = 104), of whom 29.7% (n = 51) were convicted. Most of the sample reported heroin as the primary drug of choice (76.4%, n = 139). Overall, 66.8% of the sample completed the outpatient preparation phase, while 33.2% dropped out prematurely.

Inpatient Sample (N=338): The average age was 33.37 years (SD = 6.05). The majority were males (84.9%, n = 287), single (55.4%, n = 160) and unemployed (72.7%, n = 192), while 34.5% (n = 91) graduated high school (34.5%, n = 91). In regard to drug use patterns, the majority reported heroin as the primary drug of choice (76.5%, n = 200) while 39.0% (n = 103) were injecting and 34.1%, (n = 90) were snorting as the main route of administration. (See for details Table 5)

Table 5. Participant Characteristic by Treatment Phase

Characteristic	**Completion Status by treatment Phase**	
	Outpatient Total (n=217)	**Inpatient Total (n=338)**
Age (M+SD)	33.70 (SD 6.27)	33.37 (SD 6.05)
Gender %		
Male %	87.3 (n = 186)	84.9 (n = 287)
Female %	12.7 (n = 27)	15.1 (n = 51)
Total count	(n = 217)	(n = 338)
Marital Status %		
Single	65.9 (n = 120)	55.4 (n = 160)
Married	8.8 (n = 16)	9.3 (n = 27)
Divorced	10.4 (n = 19)	9.0 (n = 26)
Windowed	1.1 (n = 2)	1.4 (n = 4)
Living together	12.1 (n = 22)	17.6 (n = 51)
Unknown	1.6 (n= 3)	7.3% (n = 21)
Total	(n = 182)	(n = 289)
Labour Status %		
Occasionally employed	11.5 (n = 21)	11.4 (n = 30)
Regularly employed	7.1 (n = 13)	6.1 (n = 16)
Student	3.3 (n = 6)	1.9 (n = 5)
Unemployed	74.2 (n = 135)	72.7 (n = 192)
Receiving social benefits	1.6 (n = 3)	1.5 (n = 4)
Not know	2.2 (n = 4)	6.4 (n = 17)
Total	(n = 182)	(n = 264)
Highest educational level completed %		
Few classes of secondary education	7.1 (n = 13)	3.8 (n = 10)
Few classes of high level education	2.7 (n = 5)	1.1 (n = 3)
Graduate Technical school	6.6 (n = 12)	9.1 (n = 24)
Graduate high school	34.6 (n = 63)	34.5 (n = 91)
Graduate primary school	14.8 (n = 27)	10.6 (n = 28)

Graduate secondary school	23.1 (n = 42)	24.2 (n = 64)
Graduate high-level education	2.7 (n = 5)	5.7 (n = 15)
Never went to school	1.6 (n = 3)	1.1 (n = 3)
Graduate University	1.1 (n = 2)	0.8 (n = 2)
Student	0.5 (n = 1)	0.8 (n = 2)
Unknown	4.9 (n = 9)	8.3 (n = 22)
Total	(n = 182)	(n = 264)
Primary Drug of Choice %		
Flunitrazepam	1.1 (n = 2)	1.9 (n = 5)
Speedball	0.5 (n = 1)	1.1 (n = 3)

Table 5: Participant Characteristic by Treatment Phase (Cont.)

Characteristic	**Completion Status by treatment Phase**	
	Outpatient Total (n=217)	**Inpatient Total (n=338)**
Morphine	1.1 (n = 2)	0.4 (n = 1)
Cocaine	4.9 (n = 9)	3.8 (n = 10)
Heroin	76.4 (n = 139)	76.5 (n = 200)
Buprenorphine misused	0.5 (n = 1)	1.1 (n = 3)
Cannabis	11 (n = 20)	6.8 (n = 18)
Methamphetamines	0.5 (n = 1)	0.4 (n = 1)
Unknown medicine	0.5 (n = 1)	0.4 (n = 1)
Benzodiazepines	1.1 (n = 2)	0.0 (n = 0)
Other opioids	2.2 (n = 4)	6.4 (n = 17)
Total	(n = 182)	(n = 264)
Root of administration primary drug %		
Smoke/inhale	19.8 (n = 36)	15.5 (n = 41)
Inject	36.3 (n = 66)	39.0 (n = 103)
Eat/drink	4.9 (n = 9)	3.8 (n = 10)
Sniff	36.8 (n = 67)	34.1 (n = 90)
Not known	2.2 (n = 4)	7.6 (n = 20)
Total	(n = 182)	(n = 264)
Frequency of use (primary drug)		
Not used in the last 30 days	14.8 (n = 27)	26.1 (n = 69)
Daily	48.4 (n = 88)	36.0 (n = 95)
2-6 days per week	19.2 (n = 35)	17.8 (n = 47)
0-1 day per week	7.1 (n = 13)	8.7 (n = 23)
Not known	10.4 (n = 19)	11.4 (n = 30)
Total	(n = 182)	(n = 264)
Needle/syringe sharing %		
Yes	29.7 (n = 49)	30.1 (n = 71)
No	70.3 (n = 116)	69.9 (n = 165)
Total	(n = 165)	(n = 236)
Arrested %		
Yes	59.8 (n = 104)	60.0 (n = 147)
No	40.2 (n = 70)	40.0 (n = 98)
Total	(n = 174)	(n = 245)
Convicted %		
Yes	30 (n = 51)	23.9 (n = 58)
No	70 (n = 119)	76.1 (n = 185)
Total	(n = 170)	(n = 243)
Prison %		
Yes	17.7 (n = 29)	18.0 (n = 41)
No	82.3 (n = 135)	81.6 (n = 186)

Unknown	---	0.4 (n = 1)
Total	(n = 164)	(n = 228)

Furthermore, 36.0% of the inpatient sample reported daily use of primary drug of choice (n = 95) and 30.1% of those injecting had engaged in needle/syringe sharing (n = 71) at some point in their lives. Around 60% had been arrested (n = 147), while of those the 23.9% have been convicted (n = 58). Overall from the 338-inpatient sample, 57.1% (n= 193) successfully completed the treatment programme, while 42.9% (n= 145) dropped out from treatment.

5.1.2 Descriptive and psychometric findings of the study variables

Values for all the study variables were verified to make certain that they fell within the possible range. The data were evaluated for accuracy of entry and Normality of distribution of continuous values were examined. In the histogram of the frequency distribution and Q-Q plot, most scales of the measures used in the statistical analysis appeared to be approximately normally distributed. The mean, standard deviation, skewness and kurtosis of the measures used in the study are summarized in the Table 6. Additionally, measures of central tendency, dispersion, and distribution were obtained for the central study variables. Findings indicated that no transformations were needed for any of the key study variables.

Table 6. Mean, Standard deviation, Skewness and Kurtosis of the Instruments

Instruments	**Mean**		**SD**		**Skewness**		**Kurtosis**	
	Out	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**
Treatment Motivation								
Problem Recognition	41.23	39.73	5.50	5.72	-.31	-.73	3.44	.72
Desire for Help	43.61	43.21	5.87	4.27	-2.38	-.45	11.5	-.16
Treatment Readiness	37.49	39.73	4.65	5.72	-.25	-.73	-.54	.72
Pressures for Treatment	29.37	30.67	7.30	6.36	.20	-.39	-.34	.18
Treatment Needs		37.98		7.61		.28		-.37
Psychological functioning								
Self-Esteem	27.15	32.28	6.11	6.84	-.21	-.13	-.02	-.13

Self-efficacy	32.57	33.08	5.60	5.13	.29	.12	1.17	.12
Depression	30.08	26.99	7.77	7.86	-.22	-.09	-.34	-.09
Anxiety	32.25	30.54	7.83	7.84	-.34	-.05	.36	-.05
Decision making	33.85	35.84	6.00	4.71	-.51	-.24	1.17	-.24
Childhood problems	31.49		7.68		.00		-.34	
Hostility	29.22	29.50	9.50	7.37	1.68	-.06	10.4	-.49
Risk Taking	31.58	32.34	7.22	7.09	-.40	-.21	0.46	-.15

Table 6: Mean, Standard deviation, Skewness and Kurtosis of the Instruments (Cont.)

Treatment engagement								
Treatment Satisfaction		38.86		5.69		-.32		-.10
Treatment Participation		40.05		5.60.		-.67		.64
Counselling Rapport		39.79		6.63		-.52		-.09
Peer Support		39,38		5.56		-.38		.67
Social Support		39.86		5.04		-.50		.33
Characteristic adaptations								
Self-Control	4.21	4.37	.91	.88	.34	.08	-.19	-.26
Effortful Control	2.14	2.13	.53	.55	.19	.14	-.18	.27
Identity Integration	3.38	3.97	.72	.64	.47	-.04	-.22	-.25
Self-Respect	2.81	2.86	.60	.59	-.25	-.23	-.47	-.46
Stable self-image	2.47	2.63	.65	.59	.11	-.15	-.71	-.31
Self-reflective functioning	2.52	2.51	.54	.56	.14	.22	-.09	-.25
Enjoyment	2.37	2.54	.60	.54	.11	.01	-.50	-.20
Purposefulness	2.68	2.85	.58	.49	-18	-.39	-.17	.17
Responsibility	3.82	4.12	.79	.75	.31	.13	.00	.27
Responsible industry	2.42	2.65	.59	.58	.31	.02	-.18	-.69
Trustworthiness	2.57	2.77	.56	.52	.19	.14	-.28	-.41
Relational capacities	4.18	4.22	.75	.67	-.12	.14	-.13	-.41
Intimacy	2.71	2.78	.55	.51	-.42	-.01	.056	-.14
Enduring relationships	2.75	2.73	.60	.53	-.15	-.09	-.31	-.25
Feeling recognized	2.63	2.75	.59	.53	-0.27	-.05	-.24	-.07
Social concordance	5.37	5.27	.87	.77	-.22	-.02	-.10	-.31
Aggression regulation	2.80	2.90	.75	.71	-.40	-.37	-.58	-.54
Frustration tolerance	2.42	2.41	.51	.47	.15	.06	-.26	-.08
Cooperation	2.94	2.90	.59	.51	-.41	-.06	-.22	-.66
Respect	2.98	2.87	.51	.46	-26	-.02	-.39	-.46

Out= Outpatients (n= 217); In= Inpatients (n=338)

5.1.3 Descriptive information of Client Evaluation of Self and Treatment (CEST)

The results presented in Table 6 suggest that compared to the normative US substance use sample (Simpson & Joe, 1993), the participants of this study experienced increased levels of *Depression, Anxiety and Hostility* but lower levels of *Self-esteem and Self-efficacy*. In terms of motivation for treatment, the Greek clients in this study reported higher levels of *Desire for Help* and similar levels of *Treatment Readiness,* and *Problem recognition.* Finally, on the treatment engagement scales the Greek sample had slightly higher *Treatment Satisfaction* and similar ratings for Counselling Rapport and Treatment Participation.

5.1.4 Descriptive information of Client Dimensional Representation of Personality Functioning

In the current study, SIPP-118 scores from the study population were compared with three different samples; two samples of PD patients and one general population sample. In agreement with previous expectations, comparable facet scores were found, as indicated by low to moderate effect sizes, between a Norwegian PD sample (Arnevik et al., 2009) and the Norwegian non clinical sample (Andrea et al. 2007). SUD patients' scores were much different from the scores of the Dutch normal population sample on the majority of the 16 SIPP-118 facets, as well as a large mean effect size on all facets between these samples. Thus, our results indicate that SUD patients have personality problems at a level of severity comparable to PD patients, and different from the normal population. The results strengthen the assumption that the SIPP-118 is a measure of pathology, which means that the questionnaire measures what it was intended to measure.

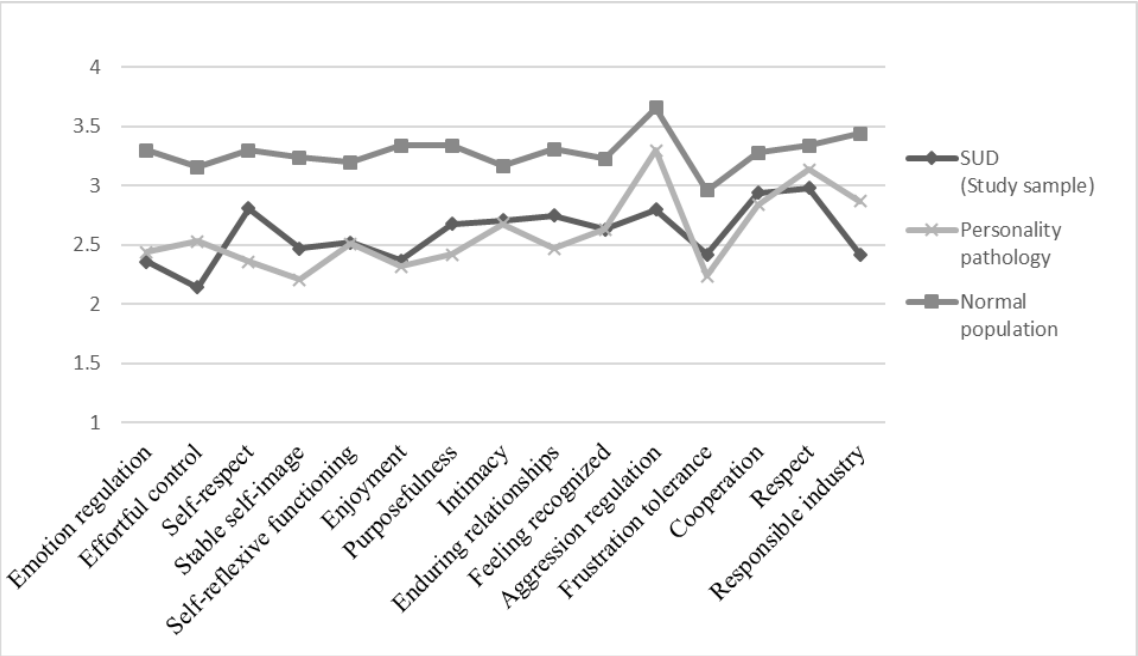


Figure 5: Mean scores for the 16 SIPP-118 facets in three different samples

5.2 Group differences between service users who completed the outpatient preparation phase and those who dropped out early on

Research Question 1

- Are there any significant differences in personality traits and characteristic adaptations between individuals who initiated treatment and those who drop-out during preparation phase?

Hypothesis

- A1: Maladaptive levels of personality dimensions will be associated with treatment initiation;
- A2: Maladaptive levels of characteristic adaptations will be associated with treatment initiation;

5.2.1 Comparison of treatment initiation and drop out group by demographic, psychosocial and motivational component

Analytic strategy

In order to determine how service users who initiated treatment (completed the outpatient treatment phase) differ from those who dropped out prematurely on identified pre-treatment variables (research question 1), comparative analyses between treatment initiation and dropout group were performed. Chi-square analyses were carried out on the categorical variables and continuous variables were examined using independent samples *t-tests*. Considering the mixed evidence regarding how service users' personality traits and characteristic adaptations are related to treatment initiation status, the null hypothesis for each of these tests was that the measure of central tendency i.e. the mean is equivalent for those initiated treatment and dropouts. Groups were considered to be significantly different if $p < .05$.

Hypothesis testing

A comparison between those who initiated treatment and those who dropped out showed no significant differences with regard to the pre-treatment characteristics gender, marital status, drug of choice and legal problems between the two groups. Results indicated that treatment initiation was associated with higher *Motivation* levels for treatment and better *Psychosocial Functioning* before treatment than the drop out group. Treatment initiation group were more likely to *Recognize their Drug Use Problems* (M = 41.88, SD = 4.97) than the drop out group (M = 39.88, SD = 6.30), *t* (202) 2.48, p = .014 and had significantly more *Desire for Help* (M = 44.53, SD = 4.87) than the drop out group (M = 41.68, SD = 7.21 t (202) = -3.343, p = .001.(see Table 7, page 117).There was significant difference in the *Treatment Readiness* levels between treatment initiation

group (M = 38.99, SD = 4.11) and the drop out group (M = 34.36, SD = 4.17), *t* (202) = -7.53, p < .001.

In regards to *Psychosocial Functioning*, dropout group (M = 32.31, SD = 7.13) were more likely to meet criteria for *Depression* than the treatment initiation group (M = 29.01, SD = 7.87), *t* (202) = 2.90, p= .004, and for Anxiety (M = 33.94, SD = 7.19) than the initiation group (M = 31.44, SD = 8.02), *t* (202) = 2.16, p= .032. Finally, results of the *t-test* showed a statistically significant mean difference in *Hostility* between the treatment initiation (M = 28.32, SD = 9.94) and drop out group (M = 31.10, SD = 8.25), *t* (202) = 1.98, p = .049.

Table 7. Psychosocial functioning and motivation in treatment initiation and dropout groups: Univariate comparison

Covariates CEST - Intake	Treatment Progress	N	Mean	SD	*t*	Mean Difference	95% Confidence Interval of the Difference		Sig. (2 tailed)
							Lower	Upper	
Psychosocial variables									
Self-Esteem	Drop-outs	67	27.11	6.29	-.070	-.064	-1.861	1.733	.944
	Initiation	140	27.17	6.06					
Self-efficacy	Drop-outs	67	31.70	5.18	-1.546	-1.284	-2.921	.353	.124
	Initiation	140	32.98	5.77					
Depression	Drop-outs	67	32.31	7.13	2.908	3.301	1.063	5.539	.004
	Initiation	140	29.01	7.87					
Anxiety	Drop-outs	67	33.94	7.19	2.164	2.495	.221	4.769	.032
	Initiation	140	31.44	8.02					
Decision making	Drop-outs	67	32.88	5.48	-1.620	-1.439	-3.191	.312	.107
	Initiation	140	34.32	6.20					
Childhood problems	Drop-outs	67	32.50	7.20	1.309	1.491	-.755	3.737	.192
	Initiation	140	31.00	7.88					
Hostility	Drop-outs	67	31.10	8.25	1.983	2.779	.015	5.542	.049
	Initiation	140	28.32	9.94					
Risk taking	Drop-outs	67	32.32	7.08	1.024	1.099	-1.017	3.216	.307
	Initiation	140	31.22	7.29					
Motivational variables									
Problem recognition	Drop-outs	67	39.88	6.30	-2.482	-2.004	-3.597	-.412	.014
	Initiation	140	41.88	4.97					
Desire for help	Drop-outs	67	41.68	7.21	-3.343	-2.849	-4.529	-1.169	.001
	Initiation	140	44.53	4.87					
Treatment readiness	Drop-outs	67	34.36	4.17	-7.535	-4.625	-5.835	-3.415	.000
	Initiation	140	38.99	4.11					
Pressure for treatment	Drop-outs	67	29.37	7.53	.008	.009	-2.137	2.155	.993
	Initiation	140	29.36	7.22					

Overall, the treatment initiation group demonstrated significantly lower levels of psychosocial problems and of *Hostility* when compared to their peers who dropped out early from treatment and higher levels on motivation for treatment.

5.2.2 Comparison of treatment initiation and drop out group by the five higher order personality traits

Analytic strategy

To test the hypothesis that treatment initiation and drop-out were associated with statistically different means on maladaptive personality traits, independent samples *t-tests* were conducted at the higher and lower order *personality traits*. As it can be seen at the Tables 5 and 6, the treatment initiation and drop-out group distributions were sufficiently normal for *t-test* examination (i.e. skew < / 2.0/ and kurtosis < /9.0/,Schmider, Ziegler, Danay, Beyer, & Buhner, 2010). Additionally, the assumption of the homogeneity of variances was tested and satisfied.

Hypothesis testing

The analysis at the higher order personality traits indicated that there were statistically significant mean differences on *Conscientiousness*, *Openness* and marginal significant for *Neuroticism* between treatment initiation and drop out group (see Table 6). More specifically, results of the independent samples *t-test* show that *Conscientiousness* differed between treatment initiation (M = 111.41, SD = 19.12) and drop out group (M = 102.29, SD = 16.0), *t* (164) = 3.09, p = .002. The two groups also differed significantly in the *Openness* domain. Treatment initiation group had significantly higher scores (M = 117.29, SD = 13.87) in comparison to drop-outs (M= 111.82, SD = 12.64), *t* (164) = 2.49, p =.014. Finally, drop-out group (M = 116.98, SD =

14.41) had also higher mean scores in the *Neuroticism* from treatment initiation group (M = 111.79, SD = 19.10), but this difference was marginal significant, *t* (146.04) = -1.96, p = .0.51. No other significant differences were found in the other two higher order personality domains *Agreeableness* and *Extraversion* between the two groups. Thus, treatment initiation group was associated with statistically significantly larger mean on *Conscientiousness* and *Openness* than the drop-outs and marginally significant lower scores on *Neuroticism*.

Table 8. Five broad personality domains and treatment status. Univariate comparisons

Higher Domains	Treatment Status	N	Mean	SD	*t*	Mean Difference	95% Confidence Interval of the Difference		Sig. (2 tailed)
							Lower	Upper	
Extraversion	Initiation	108	116.82	15.72	.727	1.789	-3.073	6.652	.486
	Drop-outs	58	115.03	13.94					
Neuroticism	Initiation	108	111.79	19.10	1.966	-5.186	-10.401	.028	.051
	Drop-outs	58	116.98	14.41					
Openness	Initiation	108	117.29	13.87	2.496	5.468	1.143	9.794	.014
	Drop-outs	58	111.82	12.64					
Agreeableness	Initiation	108	115.81	11.17	1.164	2.125	-1.478	5.728	.246
	Drop-outs	58	113.68	11.26					
Conscientiousness	Initiation	108	111.41	19.12	3.092	9.123	3.296	14.950	.002
	Drop-outs	58	102.29	16.08					

5.2.3 Comparison of treatment initiation and drop out group by the lower order personality traits

Hypothesis Testing

The analyses at the lower order dimensions confirmed the previous reported differences at the higher order traits between the two groups. There were significant differences on the lower order dimensions of *Conscientiousness* on *Order* between *t*reatment initiation group *(M = 19.17, SD = 4.37) and drop out group (M = 17.36, SD = 4.57), t* (164) = -2.50, p = .013. Treatment initiation group had significantly higher scores on *Achievement Striving (M= 19.99, SD = 3.96)* than the drop out group (M =

17.86, SD = 3.85), *t* (164) = -3.32, p = .001. Also, treatment initiation group had significantly higher scores on *Self-Discipline* (M =18.47, SD = 3.69) from the drop out group (M = 16.93, SD = 3.63), *t* (164) = -2.57, p = .011. Furthermore, there were significant differences between the two groups on the lower dimensions of Openness. Treatment initiation group had significantly higher scores on *Action* (M =20.26, SD = 2.99) than the drop out group (M = 18.72 SD = 2.92), *t* (164) = -3.19, p = .002. *Treatment initiation* group had also significantly higher scores on *Ideas* (M =18.91, SD = 3.58) and on *Aesthetics* (M =20.84, SD = 4.39) as compared to the drop out group (M = 17.65, SD = 3.32), *t* (164) = -2.21, p = .028 and (M = 19.37, SD = 4.40), *t* (164) = -2.04, p = .043, respectively. Finally, the two groups differed on the two lower order dimensions of *Neuroticism*.

Table 9. Lower order personality traits and treatment status. Univariate comparisons

Lower dimensions	Treatment Progress	N	Mean	t	Mean Difference	95% Confidence Interval of the Difference		Sig. (2-tailed)
						Lower	Upper	
Warmth	Initiation	108	19.07	-1.410	-.763	-1.83	.305	.160
	Drop-outs	58	18.31					
Gregariousness	Initiation	108	18.94	.174	.124	-1.29	1.540	.862
	Drop-outs	58	19.06					
Assertiveness	Initiation	108	18.67	-1.104	-.710	-1.98	.559	.271
	Drop-outs	58	17.96					
Activity	Initiation	108	19.99	-.757	-.456	-1.64	.733	.450
	Drop-outs	58	19.53					
Excitement Seeking	Initiation	108	19.66	.670	.402	-.782	1.587	.504
	Drop-outs	58	20.06					
Positive Emotions	Initiation	108	20.47	-.777	-.386	-1.36	.594	.438
	Drop-outs	58	20.08					
Anxiety	Initiation	108	19.14	.954	.610	-.653	1.874	.342
	Drop-outs	58	19.75					
Hostility	Initiation	108	18.81	.739	.530	-.886	1.946	.461
	Drop-outs	58	19.34					
Depression	Initiation	108	19.21	1.965	1.356	-.006	2.718	.051
	Drop-outs	58	20.56					
Self-Conscientiousness	Initiation	108	18.40	-.081	-.045	-1.15	1.066	.936
	Drop-outs	58	18.36					
Impulsiveness	Initiation	108	19.90	.765	.385	-.609	1.381	.445
	Drop-outs	58	20.29					
Vulnerability	Initiation	108	16.30	3.002	2.349	.803	3.895	.003
	Drop-outs	58	18.65					

Fantasy	Initiation	108	19.36	-.193	-.119	-1.34	1.106	.847
	Drop-outs	58	19.24					
Aesthetics	Initiation	108	20.84	-2.044	-1.463	-2.87	-.049	.043
	Drop-outs	58	19.37					

Table 9: Lower order personality traits and treatment status. Univariate comparisons (Cont.)

Feelings	Initiation	108	19.76	-.854	-.423	-1.40	.555	.394
	Drop-outs	58	19.34					
Actions	Initiation	108	20.26	-3.192	-1.544	-2.49	-.589	.002
	Drop-outs	58	18.72					
Ideas	Initiation	108	18.91	-2.216	-1.261	-2.38	-.137	.028
	Drop-outs	58	17.65					
Values	Initiation	108	18.13	-.934	-.656	-2.04	.731	.352
	Drop-outs	58	17.48					
Trust	Initiation	108	20.15	-.551	-.295	-1.35	.763	.583
	Drop-outs	58	19.86					
Straightforwardness	Initiation	108	19.37	-1.570	-.776	-1.75	.200	.118
	Drop-outs	58	18.60					
Altruism	Initiation	108	18.83	.023	.011	-.991	1.014	.982
	Drop-outs	58	18.84					
Compliance	Initiation	108	18.41	-.655	-.433	-1.74	.873	.513
	Drop-outs	58	17.98					
Modesty	Initiation	108	19.50	-.908	-.551	-1.75	.648	.365
	Drop-outs	58	18.94					
Tender-Mindedness	Initiation	108	19.52	-.159	-.079	-1.06	.905	.874
	Drop-outs	58	19.44					
Competence	Initiation	108	18.58	-1.766	-1.100	-2.33	.130	.079
	Drop-outs	58	17.48					
Order	Initiation	108	19.17	-2.508	-1.813	-3.24	-.385	.013
	Drop-outs	58	17.36					
Dutifulness	Initiation	108	18.24	-2.225	-1.447	-2.73	-.163	.027
	Drop-outs	58	16.79					
Achievement Striving	Initiation	108	19.99	-3.328	-2.128	-3.39	-.865	.001
	Drop-outs	58	17.86					
Self-Discipline	Initiation	108	18.47	-2.577	-1.541	-2.72	-.360	.011
	Drop-outs	58	16.93					
Deliberation	Initiation	108	16.95	-1.635	-1.091	-2.41	.226	.104
	Drop-outs	58	15.86					

Treatment initiation group had significant lower scores on *Vulnerability (M = 16.30, SD = 5.08)* than the drop out group (M = 18.65, SD = 4.24), *t* (164) = 3.00, p = .003; and lower scores on the *Depression* dimension (M = 19.21, SD = 4.21) than drop out group (M = 20.56, SD = 4.27), *t* (164) = 1.95, p = .051. The findings from the *t-test* on personality traits suggest that that drop-out group had significantly lower levels on *Conscientiousness* and *Openness* and higher levels on *Neuroticism* than the treatment initiation group. In other words, high *Conscientiousness* and *Openness* and low *Neuroticism* are significantly related to treatment initiation at the preparation phase.

5.2.4 Multiple logistic regression of the association between personality traits and treatment status

5.2.4.1 Higher order personality traits as predictors of treatment initiation

Analytic strategy

The first part of research question 1 was to examine predictor variables and their association with treatment initiation. It was hypothesized that more maladaptive levels on personality traits are related to drop-out status. Logistic regression was utilized to examine this question, since the dependent variable of treatment initiation is a dichotomous variable measured as treatment completion status or drop out. As mentioned, Table. 10 includes the predictor variables that were used in the initial logistic regression analyses. Based upon the significance level of each covariate within the model, those that contributed the least amount of variance, and had the lowest level of significance were removed from the model (stepwise regression) in order to build the most parsimonious model with the strongest predictors remained (Hosmer & Lemeshow, 2000).

Hypothesis testing

From the univariate logistic regressions, four control variables met the inclusion criterion while gender and age were forced into the model into the first block (see Table. 10). From the five broad domains of personality only *Conscientiousness* (OR: .97, CI: .95, .99, p= .016) and *Openness* (OR: .97, CI: .94, .99, p= .003) met the inclusion criteria. Service users control variables were forced into the model with the ENTER mode at block one and were *Age, Gender, Depression, Anxiety, Desire for Help* and *Treatment Readiness*. Both the tolerance and variance inflation factor (VIF) were

examined for each variable in order to test potential multicollinearity problems. The recommended cut-off is commonly a tolerance value of .10, which corresponds to a VIF value of above 10 (Hair et al., 1998). The tolerance and VIF values were examined for each of the variables and all fell in the range demonstrating no multicollinearity problems. The overall effect of the predictor variables upon the dependent variable of treatment initiation status was statistically significant (see Table.10). From the predictors included in the multivariate analysis, only *Openness* remained in the multivariate model after backward selection and did not reach significant levels.

Among the covariates, *Treatment Readiness* was the most influential predictor of treatment initiation with 26% increase in treatment initiation for each unit increase in readiness for treatment. *Desire for Help* also proven to be significant predictor, as for every 1-unit increase (1 scale point) we can expect a .1.08 increase in odds of initiating treatment. Finally, from the psychological wellbeing, *Depression* also remained significant predictor in the final model with odd ratio .93, for every unit increase in depression there is 7% decrease likelihood to initiate treatment.

Table 10. Regression coefficients from the unadjusted and adjusted regression models. Control variables and higher order personality traits predictors of treatment status

	Unadjusted	*Adjusted model (stepwise entry)*

	β	SE	Wald χ^2	P	OR	95% CI	β	SE	Wald χ^2	P	OR	95% CI
Demographic variables												
Age of birth	.006	.023	.069	.792	1.00	(0.9, 1.0)	-.029	.032	0.76	.372	.97	(0.4, 3.4)
Gender	-.054	.433	0.36	.901	0.94	(0.4, 2.0)	.167	.548	0.09	.761	1.18	(0.9, 1.09)
Marital Status	.053	.114	.213	.644	1.05	(0.8, 1.3)	---					
Educational level	-.057	.084	.465	.496	0.94	(0.8, 1.1)	---					
Prim Drug of Choice	-.074	.068	1.20	.272	0.92	(0.8, 1.0)	---					
Injected	.223	.592	.142	.706	1.25	(0.3, 3.9)	---					
Legal problems	.276	.276	.998	.420	1.31	(0.7, 2.2)	---					
Psychological wellbeing												
Depression	-.058	.021	7.90	.005	0.94	(0.9, 0.9)	-.063	.026	5.90	.015	.93	(0.8, 1.09)
Anxiety	-.043	.020	4.51	.034	0.95	(0.9, 0.9)	NS					
Motivation												
Desire for help	.086	.029	9.06	.003	1.09	(1.0, 1.1)	.079	.035	4.93	.026	1.08	(1.0, 1.1)
Treatment readiness	.258	.043	35.35	.000	1.29	(1.1, 1.4)	.231	.048	23.45	.000	1.26	(1.1, 1.3)
Pressures for treatment	.000	.020	.000	.993	1.00	(0.9, 1.0)	---					
Higher order personality traits (IV)												
Extraversion	-.008	.011	0.53	.466	0.99	(0.9, 1.0)	---					
Neuroticism	.017	.009	3.18	.074	1.01	(0.9, 1.0)	---					
Openness	-.031	.013	5.84	.016	0.97	(0.9, 0.9)	.028	.016	2.96	.086	1.02	(0.9, 1.06)
Agreeableness	-.017	.015	1.35	.245	0.98	(0.9, 1.0)	---					
Conscientiousness	-.028	.010	8.67	.003	0.97	(0.9, 0.9)	NS					

Key: IV=independent variable, ---- = variables not entered in multivariate model; NS=variables were entered in multivariate model but not selected by stepwise method.

5.2.4.2 Lower order personality traits as predictors of treatment status

Hypothesis testing

Similar results were found on the lower order personality traits and treatment initiation. From the univariate regressions, 3 control variables and 9 lower order dimensions met the inclusion criterion (see Table. 11). From psychological wellbeing, although *Depression* and *Anxiety* met the significant levels, they were excluded from the multivariate analysis, due to the significant overlap with the lower order personality traits *Anxiety* and *Depression* of the *Neuroticism* domain. A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between treatment initiation and dropout (chi square = 54.558, $p < .000$ with df = 6). Nagelkerke's R^2 of .396 indicated a moderate relationship between prediction and grouping.

In the final regression model, from the nine lower order dimensions that were significant and included in the backward stepwise selection, only two remained in the final step, both significant. EXP(B) value indicates that when lower order personality trait *Depression* is raised by one unit the odds ratio is 0.88. That is, for one-unit increase in *Depression* there was 12% decrease likelihood to initiate treatment. *Action* also remained a significant predictor of treatment initiation, with odd ratio 1.13, indicating that individuals scoring high in these dimensions were 13% more likely to initiate treatment than those with low score [OR] =1.13, Wald =3.53, p =.058, 95% CI [0.9, 1.3]. The prediction at the lower order personality dimension had moderate to low capacity.

Table 11. Regression coefficients from the unadjusted and adjusted regression models. Control variables and lower order personality traits predictors of treatment status

	Unadjusted						*Adjusted model (stepwise entry)*					
	β	SE	Wald χ^2	P	OR	95% CI	β	SE	Wald χ^2	P	OR	95% CI
Demographic variables												
Age of birth	0.00	.023	0.06	.792	1.00	(0.9, 1.0)	-0.02	.032	0.76	.372	0.97	(0.4, 3.4)
Gender	-0.05	.433	0.36	.901	0.94	(0.4, 2.0)	0.16	548	0.09	.761	1.18	(0.9, 1.2)
Marital Status	0.05	.114	0.21	.644	1.05	(0.8, 1.3)	---					
Educational level	-0.05	.084	0.46	.496	0.94	(0.8, 1.1)	---					
Prim Drug of Choice	-0.07	.068	1.20	.272	0.92	(0.8, 1.0)	---					
Injected	0.22	.592	0.14	.706	1.25	(0.3, 3.9)	---					
Legal problems	0.27	.276	0.99	.420	1.31	(0.7, 2.2)	---					
Psychological wellbeing												
Depression	-0.05	.021	7.90	.005	0.94	(0.9, 0.9)	---					
Anxiety	-0.04	.020	4.51	.034	0.95	(0.9, 0.9)	---					
Motivation												
Desire for help	0.08	.029	9.06	.003	1.09	(1.0, 1.1)	0.07	.035	4.93	.026	1.08	(1.0, 1.1)
Treatment readiness	0.25	.043	35.3	.000	1.29	(1.1, 1.4)	0.23	.048	23.45	.000	1.26	(1.1, 1.3)
Pressures for treatment	0.00	.020	0.00	.993	1.00	(0.9, 1.0)	---					
Lower order personality traits (IV)												
E1 Warmth	-0.06	.049	1.96	.162	0.93	(0.8, 1.0)	---					
E2 Gregariousness	0.00	.037	0.03	.861	1.00	(0.9, 1.0)	---					
E3 Assertiveness	-0.04	.042	1.21	.270	0.95	(0.8, 1.0)	---					
E4 Activity	-0.03	.044	0.57	.448	0.96	(0.8, 1.0)	---					
E5 Excitement Seeking	0.03	.045	0.45	.501	1.03	(0.9, 1.1)	---					
E6 Positive emotions	-0.04	.054	0.60	.436	0.95	(0.8, 1.0)	---					
N1 Anxiety	0.04	.042	0.91	.340	1.04	(0.9, 1.1)	---					
N2 Hostility	0.02	.037	0.54	.459	1.02	(0.9, 1.1)	---					
N3 Depression	0.07	.040	3.73	.050	1.08	(0.9, 1.1)	-0.12	.052	5.33	.021	0.88	(0.8, 0.9)
N4 Self-*Conscientiousness*	-0.00	.043	0.00	.941	0.99	(0.1, 1.8)	---					

N5 Impulsiveness	0.04	.053	0.58	.443	1.04	(0.9, 1.1)	---					
N6 Vulnerability	0.10	.035	8.24	.004	1.10	(1.0, 1.1)	NS					
O1 Fantasy	-0.00	.043	0.03	.846	0.99	(0.9, 1.0)	---					
O2 Aesthetics	-0.07	.038	4.03	.045	0.92	(0.8, 0.9)	NS					

Table 11. Regression coefficients from the unadjusted and adjusted regression models. Control variables and lower order personality traits predictors of treatment status (Cont.)

O3 Feelings	-0.04	.054	0.73	.392	0.95	(0.8, 1.0)	---					
O4 Actions	-0.17	.058	9.11	.003	0.84	(0.7, 0.9)	0.13	.069	3.53	.058	1.13	(0.9, 1.3)
O5 Ideas	-0.10	.048	4.68	.030	0.90	(0.8, 0.9)	NS					
O6 Values	-0.03	.038	0.87	.350	.965	(0.8, 1.0)	---					
A1 Trust	-0.02	.050	0.30	.580	0.97	(0.8, 1.0)	---					
A2 Straightforwardness	-0.84	.054	2.41	.120	0.91	(0.8, 1.0)	---					
A3 Altruism	0.00	.052	0.00	.982	1.00	(0.9, 1.1)	---					
A4 Compliance	-0.02	.040	0.43	.511	0.97	(0.9, 1.0)	---					
A5 Modesty	-0.04	.044	0.82	.364	0.96	(0.8, 1.0)	---					
A6 Tender-Mindedness	-0.00	.053	0.02	.873	0.99	(0.8, 1.1)	---					
C1 Competence	-.076	.044	3.03	.081	0.92	(0.8, 1.0)	---					
C2 Order	-.092	.038	5.94	.015	0.91	(0.8, 0.9)	NS					
C3 Dutifulness	-.093	.043	4.73	.030	0.91	(0.8, 0.9)	NS					
C4Achievement Striving	-.139	.044	9.94	.002	0.87	(0.7, 0.9)	NS					
C5 Self-Discipline	-.115	.046	6.19	.013	0.89	(0.8, 0.9)	NS					
C6 Deliberation	-.066	.041	2.61	.106	0.93	(0.8, 1.0)	---					

Key: IV=independent variable, ---- = variables not entered in multivariate model; NS=variables were entered in multivariate model but not selected by stepwise method. E= Extraversion; N= Neuroticism; O= Openness; A= Agreeableness; C= *Conscientiousness* Notes: Sample size for multivariate analyses N=315. Stepwise Forward entry criterion $p<0.05$. Stepwise model $F(8,315) = 26.625$, $p < 0.00$, $R2=0.41$, adjusted $R^2=0.39,5$.

Finally, similar with the analyses at the higher order, these results illustrate the significant association between *Treatment Readiness* and likelihood of treatment initiation. For every 1-unit increase in *Treatment Readiness* (1 scale point) we can expect a 1.26 increase in the odds of initiating treatment. In other words, as *Treatment Readiness* increases by one unit, so does the chance of a service user to initiate treatment by 26%.

Table 12. Main findings on broad personality traits and treatment initiation

Personality Traits Broad level (IV)	Treatment Initiation (completed the preparation phase)		COMMENTS
	Unadjusted	Adjusted model (stepwise entry)	
Extraversion	O	O	
Neuroticism	O	O	
Openness	X+	O	But failed to reach significant levels (p=0.85)
Agreeableness	O	O	
Conscientiousness	X+	O	

Notes: O= Not significant; X+ = Significant with positive; X- = Significant with negative

Table 13. Main findings on facet level personality traits and treatment initiation

Personality traits Lower order (IV)	Treatment Initiation (complete the preparation phase)		COMMENTS
	Unadjusted	Adjusted model (stepwise entry)	
E1 Warmth	O		
E2 Gregariousness	O		
E3 Assertiveness	O		
E4 Activity	O		
E5 Excitement Seeking	O		
E6 Positive emotions	O		
N1 Anxiety	O		
N2 Hostility	O		
N3 Depression	X-	X-	
N4 Self-*Conscientiousness*	O		
N5 Impulsiveness	O		
N6 Vulnerability	X-		
O1 Fantasy	O		
O2 Aesthetics	X-		
O3 Feelings	O		
O4 Actions	X-		
O5 Ideas	O		
O6 Values	O		
A1 Trust	O		
A2 Straightforwardness	O		
A3 Altruism	O		
A4 Compliance	O		
A5 Modesty	O		
A6 Tender- Mindedness	O		
C1 Competence	O		
C2 Order	O		
C3 Dutifulness	O		
C4Achievement Striving	O		
C5 Self-Discipline	O		
C6 Deliberation	O		

Notes: O= No significant; X+ = Significant with positive; X- = Significant with negative

5.2.5 Comparison of treatment initiation and drop out group by characteristic adaptations

Analytic strategy

Similar steps were taken to construct a multivariable logistic regression model for predicting treatment initiation by characteristic adaptations. After examining the frequency distributions and inter-correlations (to assess potential collinearity) among the candidate predictor variables, univariate comparisons between those who initiated treatment versus those who did not were conducted using chi-square and t-tests. In the second step, variables that differed at the $p < 0.10$ significance level were then entered into a multivariate logistic regression model. To construct a parsimonious model, predictors were removed from the model one at a time using backward selection until all remaining predictors were significant at the $p < 0.10$ level. Predictors with p-values less than 0.05 were considered statistically significant. Nagelkerke's R^2 (a "pseudo" R^2) for logistic regression (Cragg & Uhler, 1970; Nagelkerke, 1991) was calculated to assess relative improvement in prediction over the null model (i.e. intercept only model).

5.2.5.1 Comparison of treatment initiation and drop out group by the broad characteristic adaptation

Analytic Strategy

To test the hypothesis that treatment initiation and drop-out group was associated with statistically different means on characteristic adaptations, an independent samples *t-tests* were conducted at the broad and facet level adaptations.

Hypothesis testing

The results from the independent *t-test* showed significant differences in four out of five broad characteristic adaptations between treatment initiation and dropout group Table 14). There was a significant difference in the scores of *Self-control* between treatment initiation (M=4.30, SD= .921) and drop out group (M = 3.97, SD = .712), *t* (210) = 2.80, p = 0.005. The results suggest that treatment initiation is positively associated *with the capacity to tolerate, use and control one's own emotions and impulses*. Those who initiated treatment were significantly more likely to have higher adaptive levels in the *Social Concordance* (M = 5.50, SD = .859) domain, *the ability to value someone's identity, withhold aggressive impulses towards others and work together with others* than those who dropped out (M = 5.01, SD = .744), *t* (210) = 4.06), p <.001. The two groups were also significantly different in the *Identity* domain, treatment initiation group (M = 3.88, SD = .717) had significantly higher adaptive levels than the drop out group (M = 3.55, SD = .605), *t* (210) =3.26, p = .001. Dropouts were more likely *to lack the ability to see oneself and one's own life as stable, integrated and purposive* than treatment initiation group. In the *Relational capacities,* treatment initiation group (M = 4.26, SD = .601) had significantly higher adaptive levels *to genuinely care about others, be able to communicate personal experiences, and to hear and engage with the experiences of others* compared to the dropout group (M = 4.02, SD = .607), *t* (210) = 2.50, p = .013.

Table 14. Five broad characteristic adaptations and treatment status. Univariate comparisons

Broad Domains	Treatment Progress	N	Mean	SD	*t*	Mean Difference	95% Confidence Interval of the Difference		Sig. (2-tailed)
							Lower	Upper	
Self- control	Initiation	140	4.30	.921	2.802	.32452	.09586	.55318	.006
	Drop-outs	70	3.97	.712					
Social concordance	Initiation	140	5.50	.859	4.063	.48920	.25181	.72658	.000
	Drop-outs	70	5.01	.744					
Identity	Initiation	140	3.88	.717	3.267	.32755	.12988	.52523	.001
	Drop-outs	70	3.55	.605					
Relation	Initiation	140	4.26	.601	2.508	.24577	.05241	.43912	.013
	Drop-outs	70	4.02	.607					
Responsibility	Initiation	140	3.88	.851	1.803	.18768	-.01774	.39310	.073
	Drop-outs	70	3.69	.639					

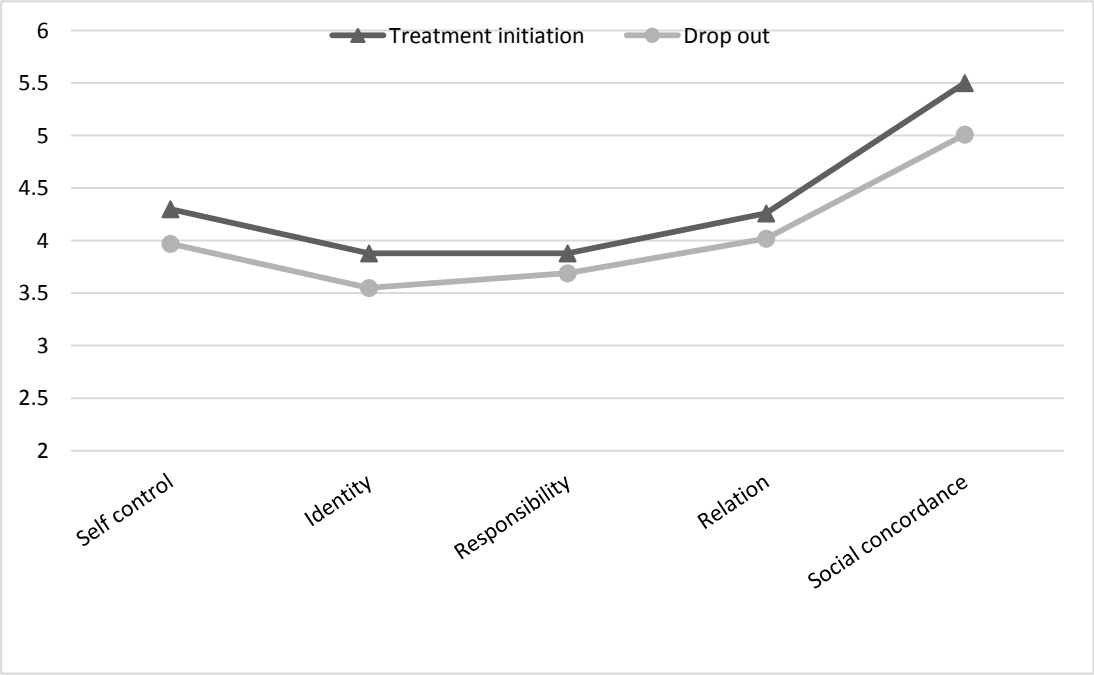


Figure 6. Mean scores for the Broad domains characteristic adaptations between treatment initiation and drop out group

5.2.5.2 Comparison of treatment initiation and drop out group by the facet level characteristic adaptation

Hypothesis Testing

At the facet level, treatment initiation group had higher scores in *Frustration Tolerance* (M = 2.47, SD = .511) (the capacity to cope with disappointments and setbacks) than drop outs (M = 2.29, SD = .457), *t* (211) = -2.51, p = .013 (Table 15). Treatment initiation group demonstrated greater capacity to withhold aggressive impulses towards others (M = 2.89, SD = .698) (*Aggression Regulation*) compared to dropouts (M = 2.52, SD = .745), *t* (211) = -3.58, p < .001. Drop out group were significantly less likely to experience that others understand what they feel and believe (M = 2.50, SD = .551) (*Feeling Recognized*) than the treatment initiation group (M = 2.69, SD = .607), *t* (211) = -2.20, p = .029. Also, dropouts scored significantly lower on the *Respect* facet - the ability to value someone's individual needs and personal identity (M = 2.79, SD = .480) than the treatment initiation group (M = 3.05 SD = .504), *t* (211) = -3.64, p < .001. Treatment initiation group had significantly higher levels on the *Purposefulness - the capacity to make life meaningful by creating the means as well as the opportunities for achievement* (M = 2.78, SD = .546), than the dropout group (M= 2.45, SD = .515), *t* (210) = -4.23, p < .001. Moreover, treatment initiation group had significantly higher levels on the *Enjoyment* (M = 2.45, SD = .615) facet - *the capacity to enjoy without feeling guilty* in comparison to drop outs (M = 2.21, SD = .549), *t* (209) = -2.75, p = .006. Treatment initiation group had significantly higher levels on the *Intimacy* facet - *the ability to share sensitive personal experiences with other people* (M = 2.78, SD = .567) compare to drop out group (M = 2.60, SD = .471), *t* (212) = -2.21, p = .028. Finally, treatment initiation group scored significantly higher on the

Trustworthiness (M = 2.62, SD = .602) - *the ability to internalize the values and norms of social collaboration and to behave in accordance to these,* compared to treatment dropouts (M = 2.46, SD = .466), *t* (2.12) = -1.94, p = .035.

Table 15. Facet level characteristic adaptations and treatment status. Univariate comparisons

Facet level	Treatment Progress	N	Mean	t	Mean Difference	95% Confidence Interval of the Difference		Sig. (2-tailed)
						Lower	Upper	
Frustration tolerance	Initiation	143	2.47	2.518	.181	.039	.324	.013
	Drop-outs	70	2.29					
Emotion regulation	Initiation	143	2.42	2.822	.219	.065	.372	.005
	Drop-outs	70	2.20					
Effortful control	Initiation	140	2.14	.398	.030	-.119	.180	.691
	Drop-outs	70	2.11					
Aggression regulation	Initiation	143	2.89	3.580	.373	.167	.578	.000
	Drop-outs	70	2.52					
Stable self-image	Initiation	141	2.53	1.871	.178	-.009	.367	.063
	Drop-outs	70	2.35					
Self-reflexive functioning	Initiation	142	2.53	.345	.027	-.129	.184	.730
	Drop-outs	69	2.50					
Self-respect	Initiation	143	2.85	1.562	.136	-.035	.309	.120
	Drop-outs	70	2.71					
Feeling recognized	Initiation	143	2.69	2.202	.189	.019	.359	.029
	Drop-outs	70	2.50					
Respect	Initiation	143	3.05	3.646	.264	.121	.407	.000
	Drop-outs	70	2.79					
Purposefulness	Initiation	142	2.78	4.234	.331	.177	.486	.000
	Drop-outs	70	2.45					
Enjoyment	Initiation	141	2.45	2.752	.239	.067	.410	.006
	Drop-outs	70	2.21					
Cooperation	Initiation	143	2.98	2.126	.179	.013	.345	.035
	Drop-outs	70	2.80					
Intimacy	Initiation	144	2.78	2.211	.173	.018	.328	.028
	Drop-outs	70	2.60					
Enduring relationships	Initiation	143	2.79		.119			

	Drop-outs	70	2.67	1.486		-.039	.278	.139
Responsible industry	Initiation	142	2.45	1.210	.104	-.065	.273	.228
	Drop-outs	70	2.35					
Trustworthiness	Initiation	144	2.62		.159			
	Drop-outs	70	2.46	2.119		.0108	.307	.036

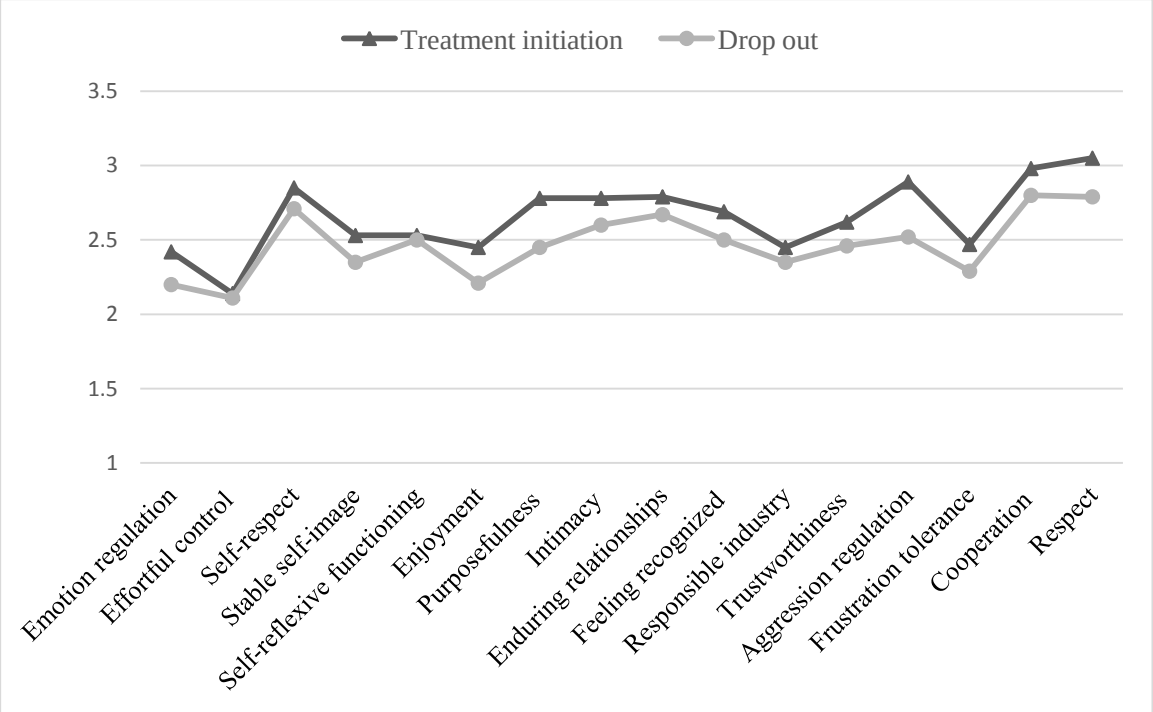


Figure 7. Mean differences between treatment completers and drop at the facet level characteristic adaptations between

The findings from the t-test on characteristic adaptations suggest that that drop-out group had significantly more dysfunctional levels of characteristic adaptations on *Self-control, Social Concordance, Relation* and *Identity* than the treatment initiation group. In other words, higher maladaptive range on *Self-control, Social Concordance, Relation* and *Identity* is associated with treatment drop out.

5.2.6 Multiple logistic regression of the association between characteristic adaptations and treatment status

5.2.6.1 Broad level characteristic adaptations as predictors of treatment initiation

Analytic strategy

Multivariable logistic regression analysis was performed with treatment initiation as the dependent variable. Predictor variables with $p < .10$ in the univariate analyses were entered in a full multivariate model. Subsequently, non-significant variables were removed, one by one, until –2 log likelihood deteriorated significantly. Appropriateness/quality of fit of the model was determined by the Hosmer-Lemeshow test, and the Nagelkerke$R^2$was used for the pseudo proportion of variance. To assess for any problems of multicollinearity, both the tolerance and variance inflation factor (VIF) was examined for each variable. The recommended cut-off is commonly a tolerance value of .10, which corresponds to a VIF value of above 10 (Hair et al., 1998). The tolerance and VIF values were examined for each of the variables and all fell in the range demonstrating no multicollinearity problems, with no tolerance levels falling below .61 and no VIF values above 1.6. From among the 217 participants of the outpatient sample, 199 were included in the analysis, with 18 cases excluded due to missing data (8, 3%). From among the 199 participants, 135 (65%) completed the preparation phase and 64 (34%) dropped out. Univariate comparisons between these groups' identified 8 candidate variables that met the inclusion criteria, 4 broad domains as predictors and three control variables, consisted by two motivational variables (*Desire for Help* and *Treatment Readiness*), and 1 psychological (*Depression*). Along with the control variables, gender and age were entered in the first block of the regression

equation (Table 14). The final regression model resulted in a total of four statistically significant predictors.

Hypothesis testing

Results indicated that the three-predictor model provided a statistically significant improvement over the constant- only-model, χ^2 (6, N= 413) = 62.89, p < .001. The Nagelkerke R^2 indicated that the model accounted for 37.9% of the total variance. The overall correction prediction was 76.4%, an improvement over the chance level. The beta weights and statistical significance for each predictor variable can be found below in Table. 16.

Table 16. Multivariate logistic regression model for predicting treatment initiation by broad domains characteristic adaptations (N=201)

	Unadjusted						*Adjusted model (stepwise entry)*					
	β	SE	Wald χ^2	P	OR	95% CI	β	SE	Wald χ^2	P	OR	95% CI
Demographic variables												
Age of birth	0.00	0.02	0.06	.792	1.00	(0.96, 1.05)	-0.02	0.03	0.76	.372	0.97	(0.4, 3.4)
Gender	-0.05	0.43	0.36	.901	0.94	(0.40, 2.02)	0.16	0.54	0.09	.761	1.18	(0.9, 1.0)
Marital Status	0.05	0.11	0.21	.644	1.05	(0.84, 1.31)	---					
Educational level	-0.05	0.08	0.46	.496	0.94	(0.80, 1.11)	---					
Prim Drug of Choice	-0.07	0.06	1.20	.272	0.92	(0.81, 1.06)	---					
Injected	0.22	0.59	0.14	.706	1.25	(0.39, 3.98)	---					
Legal problems	0.27	0.27	0.99	.420	1.31	(0.76, 2.26)	---					
Psychological wellbeing												
Depression	-0.05	0.02	7.90	.005	0.94	(0.90, 0.98)	-0.06	0.02	5.90	.015	0.93	(0.8, 0.98)
Anxiety	-0.04	0.02	4.51	.034	0.95	(0.92, 0.99)	NS					
Motivation												
Desire for help	0.08	0.02	9.06	.003	1.09	(1.03, 1.15)	0.07	0.03	4.93	.026	1.08	(1.0, 1.1)
Treatment readiness	0.25	0.04	35.35	.000	1.29	(1.18, 1.40)	0.23	0.04	23.45	.000	1.26	(1.1, 1.3)
Pressures for treatment	0.00	0.02	0.00	.993	1.00	(0.96, 1.04)	---					

Characteristic adaptations broad domains (IV)												
Self-Control	0.45	0.18	6.26	.012	1.57	(1.1, 2.2)	NS					
Identity Integration	0.71	0.22	9.81	.002	2.04	(1.3, 3.1)	NS					
Responsibility	0.31	0.19	2.62	.105	1.36	(0.9, 1.9)	---					
Relational capacities	0.45	0.20	5.00	.025	1.57	(1.0, 2.3)	NS					
Social concordance	0.71	0.18	9.60	.000	2.04	(1.4, 2.9)	0.61	2.71	19.87	.012	1.85	(1.1, 1.9)

Key: IV=independent variable, ---- = variables not entered in multivariate model; NS = variables were entered in multivariate model but not selected by stepwise method.

After backward selection, four variables remained as independent predictors in the multivariate model, all significant: *Desire for Help, Treatment Readiness, Depression* and only one of the five broad domains of characteristic adaptations, the *Social Concordance*. The results presented in the Table 16, show that *Social Concordance* remained a strong significant predictor, even when adjusted for a set of covariates. The final treatment status model indicates that after adjusting for the other predictors, those individuals with higher maladaptive range in *Social Concordance* have an increased risk of about 85% to drop-out compared to those without [OR] =1.85, Wald =19.87, p =.012, 95% CI [1.1, 1.9]. In other words, the EXP(B) value indicates that when *Social concordance* is raised by one unit the odds ratio is 1.85 times as large and therefore individuals with more adaptive functioning on *Social concordance* were 1.85 more times likely to initiate treatment. From the control variables *Treatment Readiness* was found as one of the strongest statistically significant predictors of treatment initiation. An increase of *Treatment Readiness* score by one of the five-point scale was found to increase the odds by 26% of treatment initiation [OR] =1.26, Wald =23.45, p =.012, 95% CI [1.1, 1.3]. *Desire for Help also* remained significant predictor of

treatment initiation, and individuals with high scores on *Desire for Help* are 1.12 times more likely to complete treatment, than those with low scores. Finally, the odd ratios further indicated that *Depression* was a negative predictor of treatment initiation and that for every unit increase in *Depression* there is 7% decrease likelihood to initiate treatment [OR] =0.93, Wald =5.90, p =.015, 95% CI [0.8, 0.9].

5.2.6.2 Facet level characteristic adaptations as predictors of treatment initiation

Analytic strategy

Similar procedures were used to construct the multivariate logistic regression for the facet level adaptation as predictors of treatment initiation. Of the 217 participants in the outpatient sample, 201 were included in this analysis, since 16 (7,4%) had missing cases and were excluded from the analysis. As shown in the Table 17, univariate comparisons between these groups identified six predictors for the multivariate model: *Emotion Regulation, Enjoyment, Purposefulness, Intimacy, Feeling recognized, Aggression regulation, Frustration tolerance, Cooperation, Respect*. As covariates, motivational variables both *Desire for Help* and *Treatment Readiness* were included, as well as gender and age forced into the model with the ENTER mode at block one. Psychological variables, *Depression* and *Anxiety* were not included in the multivariate analysis due to the significant overlap with the facet level adaptations.

Table 17. Multivariate logistic regression model for predicting treatment initiation by facet levels characteristic adaptations (N=201)

	Unadjusted						*Adjusted model (Backward stepwise conditional entry)*					
	β	SE	Wald χ^2	P	OR	95% CI	β	SE	Wald χ^2	P	OR	95% CI
Demographic variables												
Age of birth	0.00	.023	0.06	.792	1.00	(0.9, 1.0)	-0.03	0.34	0.92	.337	0.96	(0.9, 1.0)
Gender	-0.05	0.43	0.36	.901	0.94	(0.4, 2.0)	-0.22	0.58	0.14	.705	0.80	(0.2, 2.5)
Marital Status	0.05	0.11	0.21	.644	1.05	(0.8, 1.3)	---					
Educational level	-0.05	.084	0.46	.496	0.94	(0.8, 1.1)	---					
Prim Drug of Choice	-0.07	.068	1.20	.272	0.92	(0.8, 1.0)	---					
Injected	.22	0.59	0.14	.706	1.25	(0.3, 3.9)	---					
Legal problems	.27	0.27	.998	.420	1.31	(0.7, 2.2)	---					
Psychological wellbeing												
Depression	-.05	.021	7.90	.005	0.94	(0.9, 0.9)	NS					
Anxiety	-.04	.020	4.51	.034	0.95	(0.9, 0.9)	NS					
Motivation												
Desire for help	0.08	.029	9.06	.003	1.09	(1.0, 1.1)	0.09	0.04	5.51	.019	1.10	(1.0, 1.1)
Treatment readiness	0.25	.043	35.35	.000	1.29	(1.1, 1.4)	0.21	0.05	17.68	.000	1.24	(1.1, 1.3)
Pressures for treatment	0.00	.020	0.00	.993	1.00	(0.9, 1.0)	---					
Characteristic adaptations facet levels (IV)												
Self-Control												
Emotion Regulation	0.69	0.27	6.44	.011	1.99	(1.1, 3.4)	NS					
Effortful Control	0.11	0.28	0.60	.690	1.12	(0.6, 1.9)	---					
Identity Integration												
Self-Respect	0.37	0.24	2.41	.120	1.46	(0.9, 2.3)	NS					
Stable self-image	0.42	0.22	3.42	.064	1.52	(0.9, 2.3)						
Self - reflective functioning	0.09	2.72	0.12	.729	1.09	(0.6, 1.8)	NS					

Table 17: Multivariate logistic regression model for predicting treatment initiation by facet levels characteristic adaptations (N=201) (Cont.)

Enjoyment	0.68	0.25	7.15	.007	1.98	(1.2, 3.2)	NS					
Purposefulness	1.14	0.91	15.49	.000	3.14	(1.7, 5.5)	0.83	0.40	4.50	.034	2.37	(1.0, 5.2)
Responsibility												
Responsible industry	0.30	0.25	1.45	.227	1.35	(0.8, 2.2)	NS					
Trustworthiness	0.51	0.26	3.67	.055	1.66	(0.9, 2.8)	NS					
Relational capacities												
Intimacy	0.59	0.27	4.70	.030	1.80	(1.0, 3.0)	NS					
Enduring relationships	0.32	0.24	1.82	.177	1.38	(0.8, 2.2)	NS					
Feeling recognized	0.54	0.25	4.68	.030	1.73	(1.0, 2.8)	NS					
Social concordance												
Aggression regulation	0.71	0.20	11.59	.001	2.03	(1.3, 3.0)	0.62	0.30	4.20	.040	1.88	(1.0, 3.4)
Frustration tolerance	0.75	0.30	6.05	.014	2.13	(1.1, 3.9)	NS					
Cooperation	0.53	0.25	4.38	.036	1.70	(1.0, 2.7)	-0.78	0.46	2.88	.089	0.45	(0.1, 1.1)
Respect	1.05	0.30	11.95	.001	2.86	(1.5, 5.2)	1.08	0.53	4.50	.034	2.95	(1.0, 8.4)

Key: IV=independent variable, ---- = variables not entered in multivariate model; NS = variables were entered in multivariate model but not selected by stepwise method.

From the predictors included in the multivariate analysis, only four remained in the multivariate model after backward selection (Table 17), namely *Aggression Regulation*, *Purposefulness*, *Cooperation* and *Respect*. A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between treatment initiation and dropout group χ^2 (chi square = 73.308, $p < .001$ with df = 8). Nagelkerke's R^2 of .427 indicated a moderately strong relationship between prediction and grouping. In block 0, the probability of a correct

prediction is 67,7%. In the final model the overall predictive accuracy was 80.6% (89.7% for treatment initiation and 61.5% for drop out).

Hypothesis testing

The Wald criterion demonstrated that *Purposefulness* (*p*= .023), *Aggression Regulation* (*p* = .034) and *Respect* (*p*= .035) made a significant contribution to the prediction of treatment initiation. Although *Cooperation* remained in the final backward step, it did not reach significant levels. Results indicated that an increase on *Purposefulness* score by one of the four-point scale was found to double the odds of treatment initiation. EXP(B) value indicated that individuals with higher adaptive levels on *Purposefulness* (the capacity to make life meaningful by creating the means and opportunities for achievement) were 2.3 more times likely to initiate treatment than the group with low adaptive levels [OR] = 2.37, Wald = 4.50, *p* =.034, 95% *CI* [1.0, 5.2]. Similarly, those with higher levels of *Respect* had a 2.95 times greater odds of initiating treatment than those with lower levels [OR] = 2.95, 95% *CI* [1.0, 8.4]. High adapting levels on Respect increases approximately three times the likelihood to initiate treatment. After accounting for the other predictors in the model, service users with high maladaptive levels on *Aggression Regulation* were 1.87 times more likely to drop out than those with more adaptive levels [OR] = 1.88, Wald = 4.20, p =.040, 95% CI [1.0, 3.4]. Those with higher adaptive range in *Cooperation* had a 2.88 times greater odd of initiating treatment than those with less functional cooperation capacities, although this result fell short of the 0.05 significance level (p=.089).

Finally, the probability of treatment initiation is contingent on individuals' motivational levels. Individuals with high scores on *Treatment Readiness* were 24% more likely to initiate treatment than those with low *Treatment Readiness*. Similarly,

higher *Desire for Help* was associated with 1.10 times more likely to initiate treatment than those with low desire for help. Those with higher scores of *Treatment Readiness* and *Desire for Help*, were less likely to drop out.

Table 18. Main findings on broad and facet level characteristic adaptations and treatment initiation

Characteristic adaptations broad domains (IV)	RQ1: Treatment Initiation (complete the preparation phase)
	Adjusted model (stepwise entry)
Self-Control	O
Identity Integration	O
Responsibility	O
Relational capacities	O
Social concordance	X-
Characteristic adaptations facet level	RQ1
	Treatment initiation
Self-Control	
Emotion Regulation	O
Effortful Control	O
Identity Integration	
Self-Respect	O
Stable self-image	O
Self - reflective functioning	O
Enjoyment	
Purposefulness	X-
Responsibility	
Responsible industry	O
Trustworthiness	O
Relational capacities	
Intimacy	O
Enduring relationships	O
Feeling recognized	O
Social concordance	
Aggression regulation	X-
Frustration tolerance	O
Cooperation	O
Respect	X-

Summary of main findings

In this section, results of the analyses used for testing the two hypotheses of the research question one has been provided. In hypothesis A1 and A2, the relationships between the IVs personality traits and characteristic adaptations as predictors of treatment initiation in an outpatient preparation phase were examined. As for hypothesis A1, it was found that although those who prematurely leave treatment had significantly lower levels of *Conscientiousness* and *Openness* and higher *Neuroticism* levels than those who completed the outpatient preparation phase, the multivariable regression model found that personality traits *Conscientiousness* and *Openness* were weak predictors of outcome. At the lower order personality traits, only *Depression* from *Neuroticism* domain remained significant predictors. Based on the above findings, it can be said that assessing personality traits provide sufficient information to sketch individuals' profile that can have important clinical implications and contribute to the development of personalized interventions. However, the predictive ability to draw conclusions of whether there are some specific traits that directly predict drop out is weak. The two-sided hypothesis was that personality traits will be associated with drop out. This hypothesis was partially confirmed and the prediction power was weak. Although drop out group had statistically significant mean differences on these domains, the multivariable analysis found no evidence that low *Conscientiousness* and *Openness* were significant predictors when motivational and psychological covariates were included in the model.

Findings in regard to the IV characteristic adaptations supported hypothesis A2. Findings indicated that specific dysfunctional characteristic adaptations were significant predictors of treatment initiation. Although most of the characteristic adaptations did not

reach significant levels, a clear group pattern was found. In accordance with the hypothesis A2, treatment initiation group overall had significantly more functional characteristic adaptations than the drop out group. As expected, *Social Concordance* emerged as a strong predictor of treatment initiation at the univariate analyses and the only one that remained a significant predictor in the multivariate analyses. Individuals characterized by lacking the ability to withhold aggressive impulses towards others and having difficulty in collaborating, were more likely to drop out.

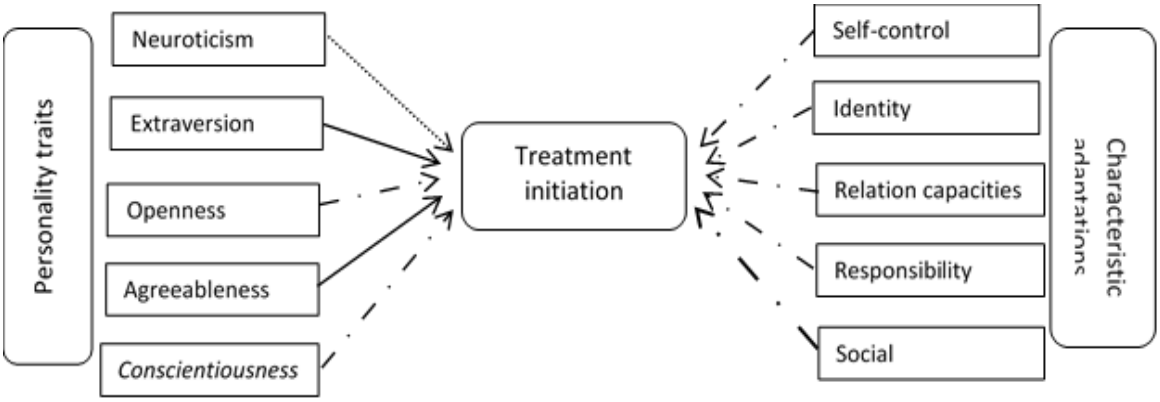


Figure 8. Significant predictors of treatment initiation

5.3 The role of characteristic adaptations on treatment engagement

Research question 2

Do individuals' characteristic adaptations differ significantly among individuals who are more or less engaged in treatment? If so, can we explain variation in the engagement indicators according to levels of clients' personality dimensions?

Hypothesis

B1: It is expected that more dysfunctional characteristic adaptations will be negative predictors of treatment engagement; and that service users more engaged in treatment will have less maladaptive personality characteristics.

B2: It is also expected that different characteristic adaptations will impact diverse segments of treatment engagement.

Multivariate Analysis

Analytic Strategy

In order to examine how services users' overall characteristic adaptations influence treatment engagement, partial correlations were initially computed between the broad domains scores and facet level scores on the one hand and the three engagement indicators on the other, while controlling for gender and age. A series of multiple regression analyses were performed to test the research question 2 and to assess what specific combination of independent variables of the broad domains of characteristic adaptations (Self-control, Social concordance, Identity integration, Relation and

Responsibility) best predicted treatment engagement (Counselling rapport, Treatment participation and Treatment satisfaction). Secondly, regression analyses were utilized to assess whether and to what extent, the independent variables at the facet level of characteristic adaptations predicted the engagement indictors.

More specifically, for each analysis, *Counsellor Rapport, Treatment Participation and Treatment Satisfaction* were the criterion variables. To test the contribution of the characteristic adaptations on treatment engagement, the broad domains of characteristic adaptations were entered on the second step after controlling for service users' socio-demographics on the first step. These pre-treatment variables were selected based on their significant levels at the bi-variate analyses and included *Depression, Anxiety, Treatment Readiness, Desire for Help, Treatment Needs and Legal Problems*. At each step, predictor variables were expected to account for a significant amount of the variance in the dependent measure.

Table 19 reports the partial correlations between the five SIPP-118 broad domain scores and the three engagement indicators. The results showed that all five broad domains (*Self-control, Social concordance, Identity integration, Relation capacities and Responsibility*) positively correlated with *Counsellor Rapport, Treatment Participation and Treatment Satisfaction*.

Table 19. Partial correlations between characteristic adaptations broad domains and treatment engagement

Broad Domains	Counseling Rapport	Treatment Participation	Treatment Satisfaction
Self-control	.38**	.33**	.25**
Social concordance	.36**	.21**	.26**
Identity-domain	.36**	.33**	.27**
Relation-domain	.35**	.38**	.31**
Responsibility	.33**	.36**	.25**

Note. Analyses controlled for gender and age. ** Correlation is significant at p=.001

Table 20 shows the partial correlations between the SIPP-118 facet level scores and the three engagement indicators. The results showed that all sixteen facet level adaptations positively correlated with *Counsellor rapport*, *Treatment participation* and *Treatment satisfaction*.

Table 20. Partial correlations between characteristic adaptations facet level and treatment engagement

Facet level	Counselling Rapport	Treatment Participation	Treatment Satisfaction
Frustration tolerance	.31**	.27**	.25**
Emotion regulation	.34**	.34**	.27**
Effortful control	.30**	.23**	.17**
Aggression regulation	.33**	.20**	.17**
Stable self-image	.32**	.29**	.16**
Self-reflexive functioning	.35**	.32**	.21**
Self-respect	.24**	.23**	.16**
Feeling recognized	.30**	.27**	.21**
Respect	.27**	.11**	.18**
Purposefulness	.25**	.27**	.23**
Enjoyment	.32**	.28**	.28**
Cooperation	.29**	.25**	.30**
Intimacy	.31**	.37**	.31**
Enduring relationships	.29**	.33**	.24**
Responsible industry	.30**	.34**	.24**
Trustworthiness	.28**	.32**	.22**

Note. Analyses controlled for gender and age. ** Correlation is significant at p=.001

5.3.1 Characteristic adaptations and counselling rapport

5.3.1.1 Broad characteristic adaptations as predictors of counselling rapport

Analytic strategy

To narrow the range of predictors in the final model, a series of bivariate regressions were used for testing the association between *Counselling Rapport*, and the broad level of characteristic adaptations as well as the covariates, as listed in Table. 19, page 149. Predictors not meeting a conservative selection criterion of $p<0.25$ were excluded from further analyses in order to prevent unstable regression models and loss of power through the inclusion of redundant variables. Results showed that 12 variables met the inclusion criterion (see Table. 21). Out of these, all five broad domains were significant predictors of *Counselling Rapport*, ranging from (β=.34; *Responsibility*) to (β=.39; *Self-Control*).Service users control variables that were incorporated were *Age, Gender, Legal Problems, Depression, Anxiety, Desire for Help and Treatment Readiness*.

Hypothesis testing

At Step 1, the multivariate analysis shown that the demographic and motivational variables (control variables) explained 34 % of the variance in *Counselling Rapport*. *Treatment Readiness* (β = .542) and *Desire for Help* (β= .188) were strong predictors of *Counselling Rapport*, indicating that higher service user's motivation was related to better *Counselling Rapport*. *Pressure for Treatment* was not reach a significant predictor of predicting *Counselling Rapport,* and thus was not included in the multivariate model. In addition, at the bi-variate analysis *Legal Problems* (β=.159, p= .003), *Depression* (β= -.238, p > .001) and *Anxiety* (β= -.134, p = .014) were also significant predictors of

Counselling Rapport. After entry of the five higher-order dimensions at step two, the total variance explained by the model was 41 %, F (8, 315) = 26.625, p <.001.

The results from the final stepwise regression model comprised five predictors, namely two higher-order dimensions and three control variables (see Table 21). In the final model only *Self-Control* (β= .195, p= .001) and *Relational Capacities* (β= .121, p= .034) remained significant predictors of *Counselling Rapport*, after statistical adjustment for effects of the other covariates. *Identity Integration, Responsibility* and *Social Concordance* were significant predictors of counsellor rapport in the expected direction in the univariate analysis, but failed to reach significance in the multivariate model.

Table 21. Regression coefficients from the unadjusted and adjusted regression models. Control variables and broad domains characteristic adaptations predictors of counselling rapport

	Unadjusted				*Adjusted model (stepwise entry)*			
		CI				CI		
	β	Lower	Upper	P	β	Lower	Upper	P
Demographic variables								
Age of birth	.139	.03	2.3	.011	.042	-.04	.12	.350
Gender	.03	-1.1	2.4	.49	.073	-.24	2.5	.105
Marital Status	.09	-.66	.80	.096	---			
Educational level	-.11	-.76	.03	.072	---			
Drug use and legal problems								
Prim Drug of Choice	-.079	-.64	.13	.20	---			
Injected	-.078	-3.1	1.3	.422	---			
Legal problems	.159	.48	2.4	.003	.138	.47	2.1	.002
Psychological wellbeing								
Depression	-.238	-.25	-.10	.000	-.080	.075	.083	.947
Anxiety	-.135	-.18	-.02	.014	NS			
Motivation								
Treatment needs	-.083	-.17	.02	.129	---			
Desire for help	.264	.22	.50	.000	.130	.04	.30	.007
Treatment readiness	.542	.46	.64	.000	.395	.29	.50	.000

Pressures for treatment	-.032	-.10	.05	.555	---			
Characteristic adaptations broad domains (IV)								
Self-Control	.394	1.9	3.3	.000	.195	.55	2.0	.001
Identity Integration	.358	2.2	4.1	.000	NS			
Responsibility	.343	1.8	3.4	.000	NS			
Relational Capacities	.375	2.3	4.1	.000	.121	.07	2.1	.034
Social Concordance	.389	2.1	3.7	.000	NS			

Key: IV=independent variable, ---- = variables not entered in multivariate model; NS=variables were entered in multivariate model but not selected by stepwise method. Notes: Sample size for multivariate analyses N=315. Stepwise Forward entry criterion $p < 0.05$. Stepwise model $F(8,315) = 26.625$, $p < 0.01$, $R^2 = 0.41$, adjusted $R^2 = 0.39$, 5.

From the control variables, motivational levels as expected significantly predicted *Counselling Rapport* in the multivariate model with strongest predictor the *Treatment Readiness* (β= .395, p < .001), followed by the *Desire for Help* (β=.130, p= .007). *Psychological wellbeing* was unrelated to *Counselling Rapport* in the multivariate analysis, although in the univariate analysis lower *Anxiety* and *Depression* scores tended to predict better *Counselling Rapport*.

5.3.1.2 Facet level characteristic adaptations as predictors of counselling rapport

Hypothesis testing

Similar procedure was followed for the facet level characteristic adaptations. The results of the series of univariate regressions showed that 23 variables met the inclusion criterion (see Table 22). Out of these, all lower-order dimensions were significant predictors of *Counselling Rapport*, ranging from (β=.236; *Self-Respect*) to (β= .364; *Aggression Regulation*). Similar with the previous analyses of the high-order dimensions, service users control variables that were incorporated were *Age, Gender, Legal Problems, Depression, Anxiety, Desire for Help and Treatment Readiness*. As the multicollinearity statistics yielded non-significant results (all variance inflation factors

[VIF] < 2, and mean VIF = 1.239, Myers, 1990; Bowerman & O'Connell, 1990), all 16 lower-order dimensions were included as predictor variables.

At step 2, the four control variables that met the selection criterion and the lower-order dimensions explained 42,2% of the variance F (9, 315) = 24.754, p < .001. The final stepwise regression model, beyond *Age* and *Gender*, comprised six predictors, namely three lower-order dimensions and three control variables (see Table. 22). The multivariate regression analysis revealed that after statistical adjustment for effects of the other covariates, three lower-order dimensions *Self - Reflective Functioning*, *Aggression Regulation* and *Enduring relationships*, remained significant predictors of *Counselling Rapport*. Higher maladaptive range of facet level characteristic adaptations was expected to predict the *Counselling Rapport* negatively. In support of this, *Self - Reflective Functioning* (β=.163, p = .002) was highly significant predictor of *Counselling Rapport* in the expected direction.

Likewise, individuals who scored high in the *ability to withhold aggressive impulses* towards others, reported higher *Counselling Rapport* (*Aggression Regulation*, β= .107, p=.036). Finally, *Enduring relationships* (β= .105, p=.042) was also a significant predictor of good *Counselling Rapport* even when adjusting for all other predictors. Although,higher levels on *Emotional Regulation* and *Intimacy* were strong predictors of *Counselling Rapport* at the univariate model, contrary to expectations, there were not significant in the multivariate model. From the motivational variables, *Treatment Readiness* (β= .398, p < .001) was the strongest predictor of *Counselling Rapport* and *Desire for Help* (β= .121, p= .011) remained a significant predictor in the multivariate model. Finally, *Depression* and *Legal Problems* were significant predictors

of *Counselling Rapport* at the univariate analysis, but only *Legal Problems* (β= .143, p = .001) remained significant at the multivariate model.

Table 22. Regression coefficients from the unadjusted and adjusted regression models. Control variables and facet level characteristic adaptations as predictors of counselling rapport

	Unadjusted				*Adjusted model (stepwise entry)*			
		CI				CI		
	β	Lower	Upper	P	β	Lower	Upper	P
Covariates								
Demographic variables								
Age of birth	.139	.03	2	.011	.050	-.03	.13	.260
Gender	.038	-1.1	2.4	.49	.070	-.2	2.5	.119
Marital Status	.098	-.66	.80	.09	----			
Educational level	-.111	-.76	.03	.07	---			
Drug use and legal problems								
Prim Drug of Choice	-.079	-.64	.13	.20	---			
Injected	-.078	-3.1	1.3	.422	---			
Legal problems	.159	.48	2.4	.003	.143	.51	2.1	.001
Psychological wellbeing								
Depression	-.238	-.25	-.10	.000	-.020	-.09	.06	.702
Anxiety	-.135	-.18	-.02	.014	NS			
Motivation								
Treatment needs	-.083	-.17	.02	.129	---			
Desire for help	.264	.22	.50	.000	.121	.03	.29	.011
Treatment readiness	.542	.46	.64	.000	.398	.30	.50	.000
Pressures for treatment	-.032	-.10		.058	---			
Characteristic adaptations facet levels (IV)								
Self-Control								
Emotion Regulation	.341	2.3	4.4	.000	NS			
Effortful Control	.325	2.3	4.5	.000	NS			
Identity Integration								
Self-Respect	.236	1.2	3.4	.000	NS			
Stable self-image	.341	2.3	4.4	.000	NS			
Self - reflective functioning	.355	2.6	4.7	.000	.163	.61	2.7	.002
Enjoyment	.317	2.3	4.5	.000	NS			
Purposefulness	.245	1.6	4.2	.000	NS			

Responsibility								
Responsible industry	.323	2.3	4.3	.000	NS			
Trustworthiness	.308	2.3	4.6	.000	NS			
Relational capacities								
Intimacy	.331	2.5	4.9	.000	NS			
Enduring relationships	.326	2.4	4.7	.000	.105	.04	2.2	.042
Feeling recognized	.319	2.4	4.7	.000	NS			
Social concordance								
Aggression regulation	.364	2.1	3.8	.000	.107	.05	1.6	.036
Frustration tolerance	.335	2.9	5.5	.000	NS			
Cooperation	.305	2.2	4.6	.000	NS			
Respect	.286	2.3	5.0	.000	NS			

Key: IV=independent variable, ---- = variables not entered in multivariate model; NS=variables were entered in multivariate model but not selected by stepwise method. Notes: Sample size for multivariate analyses N=315. Stepwise Forward entry criterion $p < 0.05$. Stepwise model $F(9,315) = 24.754$, $p < 0.01$, R2=0.42, adjusted $R^2 = 0.40$

5.3.2 Characteristic adaptations and treatment participation

5.3.2.1 Broad characteristic adaptations as predictors of treatment participation

Analytic strategy

To narrow the range of predictors in the final model, bivariate regressions were used for testing the association between *Treatment Participation*, broad characteristic adaptations and the covariates as listed in Table 23. Predictors not meeting a conservative selection criterion of $p < 0.25$ were excluded from further analyses in order to prevent unstable regression models and loss of power through the inclusion of redundant variables.

Hypothesis testing

At Step 1, the multivariate analysis showned that the demographic and motivational variables explained 23.9 % of the variance in treatment participation $F(7, 328) = 14.755$, $p < .001$. At step two, the control variables and the higher-order dimensions of characteristic adaptations explained 34.2% of the variance in *Treatment*

Participation F (11, 314) = 14,304, p < .001. The four out of five higher-order dimensions accounted for a significant proportion of variance in treatment participation as shown in the Table 23.

Table 23. Regression coefficients from the unadjusted and adjusted regression models. Control variables and broad domains characteristic adaptations predictors of treatment participation

	Unadjusted				*Adjusted model (stepwise entry)*			
		CI				CI		
	β	Lower	Upper	P	β	Lower	Upper	P
Demographic variables								
Age of birth	.139	.032	23	.011	-.008	-.08	.07	.874
Gender	.038	-1.1	2.4	.49	.072	-.31	2.2	.139
Marital Status	.098	-.66	.80	.096	NS			
Educational level	-.111	-.76	.03	.072	NS			
Drug use and legal problems								
Prim Drug of Choice	-.079	-.643	.13	.201	---			
Injected	-.078	-3.1	1.3	.422	---			
Legal problems	.159	.48	2.4	.003	.044	-.38	1.0	.295
Psychological wellbeing								
Depression	-.238	-.25	-.10	.000	-.61	-.08	.05	.351
Anxiety	-.135	-.18	-.02	.014	.074	-.03	.12	.254
Motivation								
Treatment needs	-.083	-.17	.02	.129	---			
Desire for help	.264	.22	.50	.000	.181	.09	.32	.000
Treatment readiness	.542	.46	.64	.000	.246	.11	.30	.000
Pressures for treatment	-.032	-.10	.05	.555	---			
Characteristic adaptations								
Self-Control	.394	1.9	3.3	.000	.230	.41	2.1	.004
Identity Integration	.358	2.2	4.1	.000	NS			
Responsibility	.343	1.8	3.4	.000	.160	.21	1.8	.014
Relational capacities	.375	2.3	4.1	.000	.288	1.1	3.0	.000
Social concordance	.389	2.1	3.7	.000	.298	-2.8	-.94	.000

Key: IV=independent variable, ---- = variables not entered in multivariate model; NS=variables were entered in multivariate model but not selected by stepwise method. Notes: Sample size for multivariate analyses N=315. Stepwise Forward entry criterion p < 0.05. Stepwise model F (11,314) =14.304, p < 0.00, R2 =.34, adjusted R2 =.31

Examination of the individual beta weights of the broad domains showed that *Social Concordance* (β =.298, p <.001) was a highly significant predictor of *Treatment Participation*, indicating that service users who have the ability to value someone's identity, withhold aggressive impulses towards others and to work together with others, reported higher scores of *Treatment Participation*. The capacity to tolerate, use and control one's own emotions and impulses grouped as *Self-Control* domain (β = .230, p =.004) significantly predicted *Treatment Participation*. The *Relational Capacities* domain was also a significant predictor of *Treatment Participation* (β = .288, p <.001), indicating that higher adaptive scores on the capacity to genuinely care about others, to be able to communicate personal experiences, and to hear and engage with the experiences of others, predict better *Treatment Participation*. Finally, *Responsibility* domain (β = .160, p=.014) predicted *Treatment Participation*, indicating that service users who have the capacities to set realistic goals and to achieve these goals in line with the expectations they have generated in others have higher treatment participation levels.

The motivational components were significant predictors of *Treatment Participation*. As expected, *Treatment Readiness* (β= .246, p < .001) and *Desire for Help*(β = .181, p < .001) remained highly significant predictors of *Treatment Participation* at the multivariate model. *Pressure for Treatment* failed to reach significant level at the univariate level, so was not included in the multivariate analysis. The univariate relationships between the *Treatment Participation* and *Depression, Anxiety and Legal Problems* were significant, yet none of these variables predicted *Treatment Participation* in the multivariate model. Other background characteristics were not useful predictors of *Treatment Participation.*

5.3.2.2 Facet level characteristic adaptations as predictors of treatment participation

Analytic strategy

From the univariate regressions 23 variables met the inclusion criterion (see Table 24, p. 159). All lower-order dimensions were significant predictors of *Treatment Participation*, ranging from (*Respect*; β=.124) to (*Intimacy*; β= .385). Service users control variables were *Age*, *Gender, Legal Problems, Depression, Anxiety, Desire for Help* and *Treatment Readiness*. As the multicollinearity statistics yielded non-significant results (all variance inflation factors [VIF] < 3, and mean VIF = 1.319, Myers, 1990; Bowerman & O'Connell, 1990), all 16 lower-order dimensions were included as predictor variables. At step 2, the four control variables that met the selection criterion and the facet level adaptations explained 33.2 % of the variance, $F(9, 314) = 16.819$, $p < .001$. The final stepwise regression model comprised nine predictors, namely four facet level adaptations and five control variables (see Table 24).

Hypothesis testing

The multivariate regression analysis revealed that four facet levels *Emotional regulation, Intimacy, Trustworthiness* and *Respect* accounted for additional variance in *Treatment Participation* after statistical adjustment for effects of the other covariates. Higher maladaptive range on *Emotional Dysregulation* was expected to predict behavioural problems on participating in the treatment environment. In support of this, individuals who scored low on *Emotional Regulation*, the capacity to tolerate and manage the emotions and to control their intensity, course, and expression, had significantly lower levels of *Treatment Participation* (β = .205, p = .001). Low levels of *Intimacy,* that is, the ability to share sensitive personal experiences with other people, was also expected to negatively predict *Treatment Participation*. That was also

confirmed, as low *Intimacy* levels significantly negatively predicted *Treatment Participation* (β= .194, p < .001). Furthermore, *Trustworthiness* was also a significant predictor of *Treatment Participation* (β= .151, p = .008). Service users with low scores on the internalized values and norms of social collaboration and ability to behave in accordance to these were participating less in the treatment process.

Finally, *Respect* was a significant predictor of *Treatment Participation* (β= .158, p = .005), indicating that the capacity to value someone's individual needs and personal identity predicts *Treatment Participation*. From the motivational variables, *Treatment Readiness* (β= .398, p > .001) and *Desire for Help* (β= .121, p= .011) were highly significant predictors of *Treatment Participation* in the multivariate model, whereas form psychological wellbeing *Depression* and *Anxiety* were significant at the univariate level, but not in the multivariate model.

Table 24. Regression coefficients from the unadjusted and adjusted regression models. Client pre-treatment variables and facet level characteristic adaptations predictors of treatment participation

	Unadjusted				*Adjusted model (stepwise entry)*			
		CI				CI		
	β	Lower	Upper	P	β	Lower	Upper	P
Demographic variables								
Age of birth	.114	.00	.18	.036	.007	-.07	.08	.879
Gender	.014	-1.3	1.7	.795	.082	-.17	2.4	.090
Marital Status	.038	-.25	.49	.524	---			
Educational level	-.124	-.68	.00	.045	NS			
Drug use and legal problems								
Prim Drug of Choice	-.111	-.43	.21	.507	---			
Injected	-.050	-2.4	1.4	.608	---			
Legal problems	.040	-.53	1.1	461	NS			
Psychological wellbeing								
Depression	-.226	-21	-.07	.000	-.044	-.09	.04	.417
Anxiety	-.150	-.16	-.02	.006	NS			
Motivation								
Treatment needs	-.019	-.07	.10	.730	---			
Desire for help	.334	.21	.45	.000	.188	.10	.33	.00
Treatment readiness	.436	.29	.47	.000	.225	.09	.28	.000
Pressures for treatment	-.054	-.12	.01	.138	NS			
Characteristic adaptations facet levels								
Self-Control								
Emotion Regulation	.346	2.0	3.8	0.00	.205	.72	2.7	.001
Effortful Control	.254	1.3	3.2	0.00	NS			

Identity Integration								
Self-Respect	.234	1.0	2.8	0.00	NS			
Stable self-image	.307	1.6	3.4	0.00	NS			
Self - reflective functioning	.322	1.8	3.7	0.00	NS			
Enjoyment	.281	1.5	3.5	0.00	NS			
Purposefulness	.261	1.5	3.7	0.00	NS			
Responsibility								
Responsible industry	.360	2.2	3.9	0.00	NS			
Trustworthiness	.349	2.3	4.3	0.00	.151	.37	2.4	.008
Relational capacities								
Intimacy	.385	2.7	4.6	0.00	.194	.85	2.8	.000
Enduring relationships	.341	2.2	4.1	0.00	NS			
Feeling recognized	.290	1.7	3.6	0.00	NS			
Social concordance								
Aggression regulation	.225	82	2.3	0.00	NS			
Frustration tolerance	.295	2.0	4.2	0.00	NS			
Cooperation	.261	1.4	3.5	0.00	NS			
Respect	.124	.15	2.5	0.00	.158	-2.8	-.51	.005

Key: IV=independent variable, ---- = variables not entered in multivariate model; NS=variables were entered in multivariate model but not selected by stepwise method. Notes: Sample size for multivariate analyses N=315. Stepwise Forward entry criterion $p<0.05$. Stepwise model $F(9, 314) = 16.819$, $p < .001$, R^2=.33,2, adjusted R^2=.31

5.3.3 Characteristic adaptations and treatment satisfaction

5.3.3.1 Broad characteristic adaptations as predictors of treatment satisfaction

Analytic strategy

Similar procedure was followed for the bivariate regressions for testing the association between *Treatment Satisfaction*, broad characteristic adaptations and the covariates as listed in Table 25. At Step 1, the multivariate analysis shown that the demographics and motivational variables (control variables) explained 28.5 % of the variance in *Treatment Satisfaction*, F (6, 335) =21,866, p <.001. At step two, the control variables and the broader level characteristic adaptations explained 31.1% of the variance in *Treatment Satisfaction*, F (7, 314) = 19,751, p < .001.

Hypothesis testing

From the broader level adaptations, only the *Relational Capacities* was a significant predictor of *Treatment Satisfaction*, accounting for 2.6 % additional variance

with a value for adjusted R^2 change of .026. The motivational components were significant predictors of *Treatment Satisfaction*, with high scoring service users on *Readiness* and *Desire* for treatment, reporting significantly better satisfaction with services received with (β=.396, p <.001) and (β=.148, p =.005) respectively.

Table 25. Regression coefficients from the unadjusted and adjusted regression models. Client pre-treatment variables and broad domains characteristic adaptations predictors of treatment satisfaction

	Unadjusted				*Adjusted model (stepwise entry)*			
		CI				CI		
	β	Lower	Upper	P	β	Lower	Upper	P
Demographic variables								
Age of birth^	.078	-.02	.17	.154	-.008	-.094	.079	.865
Gender^	-.004	-1.8	1.6	.941	.016	-1.34	1.59	.867
Marital Status	.025	-.32	.50	.670	NS			
Educational level	-.078	-.63	.13	.208	NS			
Drug use and legal problems								
Prim Drug of Choice	.016	-.32	.42	.793	---			
Injected	-.57	-2.7	1.5	.560				
Legal problems	.070	-.33	1.5	.202	NS			
Psychological wellbeing								
Depression	-232	-.24	-.09	.000	-.087	-.156	.031	.190
Anxiety	-.125	-.16	-.01	.022	NS			
Motivation								
Treatment needs	-.112	-.19	-.00	.041	NS			
Desire for help	.381	.24	.51	.000	.148	.060	.324	.005
Treatment readiness	.495	.40	.58	.000	.396	.284	.490	.000
Pressures for treatment	-.003	-.08	.07	.953				
Characteristic adaptations (IV)								
Self-Control	.268	1.0	2.3	.000	NS			
Identity Integration	.273	1.4	3.2	.000	NS			
Responsibility	.254	1.0	2.6	.000	NS			
Relational capacities	.319	1.7	3.5	.000	.189	.652	2.48	.001
Social concordance	.284	1.2	2.8	.000	NS			

Key: IV=independent variable, ^ = Forced into the model ---- = variables not entered in multivariate model; NS=variables were entered in multivariate model but not selected by stepwise method. Notes: Sample size for multivariate analyses N=315. Stepwise Forward entry criterion p<0.05. Stepwise model F (7, 314) = 19.751, p < .000, R^2=.31,1, adjusted R^2=.29,5

The other two motivational indicators, *Treatment Needs* was a significant predictor of *Treatment Satisfaction* in the univariate analysis, but did not reach significant levels in the multivariate analysis, whereas *Pressure for Treatment* was unrelated to *Treatment Satisfaction*. Finally, psychological wellbeing variables did not reach significant levels in the multivariate analysis.

5.3.3.2 Lower order dimensions of characteristic adaptations as predictors of treatment satisfaction

Analytic strategy

From the univariate regressions 23 variables met the inclusion criterion (see Table 26, p. 163). All lower-order dimensions were significant predictors of *Treatment Satisfaction,* ranging from (β=.184; *Stables Self-Image*) to (β= .322; *Intimacy*). Service users control variables were *Age, Gender, Legal Problems, Depression, Anxiety, Desire for Help and Treatment Readiness*. As the multicollinearity statistics yielded non-significant results (all variance inflation factors [VIF] < 3, and mean VIF = 1.21, Myers, 1990; Bowerman & O'Connell, 1990), all 16 lower-order dimensions were included as predictor variables. At step 2, the four control variables that met the selection criterion and the lower-order dimensions explained 31,6 % of the variance, F (6, 314) = 21.583, p < .001. The final stepwise regression model comprised six predictors, namely two lower-order dimensions and four control variables (see Table. 26).

Hypothesis testing

The multivariate regression analysis revealed that two facet levels *Intimacy* (β = .118, p = .038) and *Cooperation* (β = .134, p = .019) accounted for additional variance in *Treatment Satisfaction* after statistical adjustment for effects of the other covariates. From the motivational variables, *Treatment Readiness* (β = .386, p > .001) and *Desire for Help* (β = .148, p = .021) were highly significant predictors of *Treatment Satisfaction* in the multivariate model, whereas from the psychological wellbeing only *Depression* remained in the multivariate model, but failed to reach significant levels.

Table 26. Regression coefficients from the unadjusted and adjusted regression models. Client pre-treatment variables and facet level characteristic adaptations predictors of treatment satisfaction

	Unadjusted				*Adjusted model (stepwise entry)*			
		CI				CI		
	β	Lower	Upper	P	β	Lower	Upper	P
Demographic variables								
Age of birth^	.139	.032	239	.011	-.006	-.092	.081	.902
Gender^	.038	-1.163	2.415	.49	.011	-1.272	1.607	.819
Marital Status	.098	-.66	.804	.096	---			
Educational level	-.111	-.767	.033	.072	---			
Drug use and legal problems								
Prim Drug of Choice	-.079	-.643	.136	.201	---			
Injected	-.078	-3.184	1.344	.422	---			
Legal problems	.159	.486	2.443	.003	NS			
Psychological wellbeing								
Depression	-.238	-.256	-.100	.000	NS			
Anxiety	-.135	-.181	-.021	.014	NS			
Motivation								
Treatment needs	-.083	-.176	.022	.129				
Desire for help	.264	.220	.506	.000	.154	.072	.329	.002
Treatment readiness	.542	.463	.649	.000	.386	.273	.473	.000
Pressures for treatment	-.032	-.108		.058	NS			
Characteristic adaptations facet levels								
Self-Control								
Emotion Regulation	.270	1.5	3.6	0.00	NS			
Effortful Control	.189	.81	3.0	0.00	NS			
Identity Integration								
Self-Respect	.163	.52	2.5	0.00	NS			

Stable self-image	.184	.70	2.7	0.00	NS			
Self - reflective functioning	.213	1.0	3.1	0.00	NS			
Enjoyment	.280	1.8	4.0	0.00	NS			
Purposefulness	.232	1.4	3.8	0.00	NS			
Responsibility								
Responsible industry	.255	1.4	3.5	0.00				
Trustworthiness	.244	1.4	3.8	0.00	NS			
Relational capacities								
Intimacy	.322	2.3	4.6	0.00	.118	.072	2.51	.038
Enduring relationships	.263	1.6	3.9	0.00	NS			
Feeling recognized	.232	1.3	3.6	0.00	NS			
Social concordance								
Aggression regulation	.196	.70	2.4	0.00	NS			
Frustration tolerance	.269	1.9	4.5	0.00	NS			
Cooperation	.304	2.1	4.4	0.00	.134	.241	2.62	.019
Respect	.185	.94	3.6	0.00	NS			

Key: IV=independent variable, ^ = Forced into the model, ---- = variables not entered in multivariate model; NS=variables were entered in multivariate model but not selected by stepwise method. Notes: Sample size for multivariate analyses N=315. Stepwise Forward entry criterion $p<0.05$. Stepwise model $F(6, 314) = 21.583$, $p < .001$, R^2=.31,6, adjusted R^2=.27,4

5.4 The role of characteristic adaptations on treatment completion

Research question 3

- Do individuals' characteristic adaptations differ significantly among individuals who complete treatment and those who drop out? If so, can individuals' overall characteristic adaptations profile be used as a prognostic indicator of treatment completion?

Hypothesis

C1: More dysfunctional characteristic adaptations will be negative prognostic indicators for treatment completion.

5.4.1 Comparison of treatment completers and those who dropped out by demographic, psychosocial, motivational and treatment engagement component

Analytic Strategy

In order to examine the differences on demographic, drug use and characteristic adaptations variables between service users who completed treatment and those who dropped out, t-tests compared means for continuous variables and chi-square analyses for categorical data (e.g., gender) were utilized.

Hypothesis Testing

Table 27 reports the results obtained from the t-test comparisons between treatment completers and drop outs group on Psychosocial functioning, Motivation and Treatment engagement. Results indicated that the treatment completion group had significantly higher motivation levels for treatment and better psychosocial functioning before treatment than the drop out group. Treatment completers had significantly higher scores on *Desire for Help* (M = 43.64, SD = 4.23) as compared to drop out group (M= 42.63, SD= 4.26), *t* (336) = -2.15, p < .001 and higher *Treatment Readiness* (M= 42.15, SD= 4.25) comparing to drop outs (M= 36.52, SD = 5.72), *t* (336) = - 9.97, p < .001. As indicated (in Table 27, page 166), the drop out group reported significantly higher

scores on *Treatment Needs* (M = 39.44, SD = 5.65) than the treatment completers (M = 36.88, SD = 6.66), *t* (336), = 3.71, p < .001. *Pressure for treatment* was not significant between the two groups. In regard to psychosocial functioning, treatment dropouts had significantly higher levels of *Depression* (M=29.57, SD= 7.35), and *Anxiety* (M = 32.68, SD = 6.79) than treatment completers (M= 25.06, SD = 7.70), *t* (336) = 5.40, p < .001 and (M = 28.93, SD = 8.20), *t* (336) = 4.58, p < .001, respectively. Finally, treatment dropouts were more likely to experience significantly higher levels of *Hostility* (M=33.35, SD= 6.46) compared to treatment completers (M = 26.66, SD = 6.75), *t* (336) = 9.15, p < .001

Regarding treatment engagement, treatment completers had significantly higher *Counselling Rapport* (M= 42.88, SD= 4.21) than the drop out group (M= 35.78, SD= 5.31), *t* (336) =-13.21, p < .001 and *Treatment Participation* (M=42.29, SD= 4.00) as compared to the drop out group (M= 37.08, SD= 4.77), *t* (336) = -10.85, p < .001. Finally, treatment completers were more satisfied with the treatment (M= 41.27, SD= 4.63) compared to drop outs (M= 35.63, SD= 5.38), *t* (336) = -10.30, p < .001.

Table 27. Psychosocial functioning, motivation and engagement in treatment completion and dropout groups: Univariate comparison

Covariates CEST	Treatment Progress	N	Mean	SD	*t*	Mean Difference	95% Confidence Interval of the Difference	
							Lower	Upper
Psychosocial variables								
Self-efficacy	Drop-outs	144	30.96	4.63	-7.02**	-3.71	-4.78	-2.67
	Completers	192	34.68	4.91				
Self-esteem	Drop-outs	144	29.74	6.69	-6.20**	-4.43	-5.84	-3.03
	Completers	192	34.18	6.33				
Risk taking	Drop-outs	144	34.07	6.17	4.06**	3.02	1.52	4.53
	Completers	192	31.04	7.46				
Hostility	Drop-outs	144	33.35	6.46	9.15**	6.69	5.25	8.12
	Completers	192	26.66	6.75				

Depression	Drop-outs	144	29.57	7.35	5.40**	4.50	2.86	6.14
	Completers	192	25.06	7.70				
Anxiety	Drop-outs	144	32.68	6.79	4.58**	3.75	-3.09	-1.08
	Completers	192	28.93	8.20				
Motivational variables								
Pressure for treatment	Drop-outs	144	31.37	7.60	1.46*	1.22	-.41	2.87
	Completers	192	30.14	7.59				
Treatment readiness	Drop-outs	144	36.52	5.70	-9.97*	-5.64	-6.67	-4.53
	Completers	192	42.17	4.25				
Desire for help	Drop-outs	144	42.63	4.26	-2.15*	-1.00	-1.92	8.12
	Completers	192	43.64	4.23				
Treatment needs	Drop-outs	144	39.44	5.65	3.71**	2.55	1.20	3.91
	Completers	192	36.88	6.66				
Treatment engagement								
Counselling rapport	Drop-outs	144	35.78	5.31	-13.21**	-7.09	-8.15	-6.04
	Completers	192	42.88	4.21				
Treatment satisfaction	Drop-outs	144	35.63	5.38	-10.30**	-5.64	-6.72	-4.56
	Completers	192	41.27	4.63				
Treatment participation	Drop-outs	144	37.08	4.77	-10.85**	-5.20	-6.15	-4.26
	Completers	192	42.29	4.00				

*= p = .05; **= p< .001

5.4.2 Characteristic adaptations and treatment completion

5.4.2.1 Comparison of treatment completers and drop out group by the broad characteristic adaptations

Analytic Strategy

To test the hypothesis that service users who completed treatment had more functional characteristic adaptations than those who dropped out from treatment, *t-tests* compare a means was conducted at the broad and facet level adaptations. As indicated in the Table 6 page 113, distributions were sufficiently normal for t-tests examination (i.e. skew < / 2.0/ and kurtosis < /9.0/ Schmider, Ziegler, Danay, Beyer, & Buhner, 2010).

Hypothesis Testing

The results of the univariate *t-test* comparisons between treatment completers and the drop out group on the broad and facet level characteristic adaptations are

provided in Table 28. What is interesting about the data in this table is that there were significant group differences in all five-broad characteristic adaptations between treatment completers and those who dropped out from treatment. In the *Social Concordance* domain - *the ability to value someone's identity, withhold aggressive impulses towards others and work together with others, the* treatment completers (M = 5.58, SD = .684) had a significantly higher mean than those who dropped out from treatment (M = 4.87, SD =.786), *t* (316) = -9.13, p < .001). The two groups were also significantly different in the *Identity* domain. The drop out group had a lower mean on *the ability to see oneself and one's own life as stable, integrated and purposive* (M = 3.67, SD= .560) than treatment completers (M = 4.20, SD= .610), *t* (315) = -7.81), p < .001). In the *Relational capacities*, treatment completers had significantly higher *capacity to genuinely care about others, be able to communicate personal experiences, and to hear and engage with the experiences of others* (M = 4.45, SD = .638) compared to the drop out group (M = 3.93, SD = .589), *t* (317) = -7.56, p < .001. Treatment completers had a significantly higher mean on *Self-control* (M = 4.75, SD = .786) than the drop out group (M = 3.88, SD = .737), *t* (315) = -10.15, p < .001, as well as on *Responsibility* (M = 4.37, SD = .737) compared to the drop out group (M= 3.80, SD= .655), *t* (315) = -7.17, p < .001.

Table 28. Characteristic adaptations in treatment completion and dropout group: Univariate comparisons

	Drop out group (n= 138)				Completers (n= 180)					Mean Difference	95% Confidence Interval of the Difference	
	Mean	SD	95% CI		Mean	SD	95% CI		*t*		Lower	Upper
			Lower	Upper			Lower	Upper				
Broad domains												
Self- control	3.88	.737	3.75	4.00	4.75	.786	4.64	4.87	- 10.15**	-.88	-1.05	-.709
Social concordance	4.87	.786	4.76	4.99	5.58	.690	5.48	5.68	-9.13**	-.71	-.865	-.559
Identity	3.67	.560	3.58	3.77	4.20	.610	4.11	4.29	-7.81**	-.52	-.654	-.391
Relation	3.93	.589	3.83	4.03	4.45	.638	4.36	4.55	-.7.56**	-.52	-.667	-.392
Responsibility	3.80	.655	3.69	3.91	4.37	.737	4.26	4.48	-7.17**	-.57	-.728	-.414
Facet level												
Frustration tolerance	2.21	.382	2.16	2.29	2.59	.469	2.51	2.65	-7.89**	-.37	-.466	-.280
Emotional regulation	2.15	.382	2.07	2.74	2.66	.469	2.58	2.74	-8.54**	-.50	-.625	-.391
Effortful control	1.97	.485	1.89	2.05	2.47	.555	2.39	2.54	-8.97**	-49	-.609	-.390
Aggression regulation	2.53	.714	2.42	2.66	3.17	.574	3.11	3.28	-8.70**	-.64	-.786	-.496
Stable self-image	2.38	.562	2.29	2.48	2.83	.538	2.75	2.91	-7.24**	-.45	-.573	-.328
Self-reflexive functioning	2.30	.486	2.22	2.38	2.68	.571	2.68	2.76	-6.24**	-.37	-.498	-.259
Self-respect	2.66	.589	2.57	2.62	3.01	.559	2.93	3.09	-5.37**	-.34	-.470	-.218
Feeling recognized	2.54	.525	2.46	2.64	2.92	.480	2.86	3.00	-6.80**	-.38	-.490	-.270
Respect	2.70	.445	2.62	2.77	3.00	.431	2.94	3.07	-6.14**	-.30	-.397	-.204
Purposefulness	2.68	.480	2.60	2.76	2.97	.464	2.90	3.04	-5.43**	-.28	-.394	-.184
Enjoyment	2.37	.483	2.29	2.46	2.74	.527	2.67	2.82	-6.52**	-.32	-.484	-.260
Cooperation	2.69	.477	2.61	2.77	3.05	.494	2.99	3.13	-6.62**	-.36	-.473	-.256
Intimacy	2.58	.459	2.52	2.68	2.92	.512	2.87	3.01	-6.20**	-.34	-.448	-.232
Enduring relationships	2.55	.500	2.47	2.64	2.88	.518	2.82	2.97	-5.80**	-.33	-.444	-.233
Responsible industry	2.40	.501	2.32	2.50	2.83	.568	2.75	2.92	-7.08**	-.43	-.549	-.310
Trustworthiness	2.60	.466	2.53	2.69	2.91	.525	2.83	2.98	-5.54**	-.31	-.421	-.200

5.4.2.2 Comparison of treatment completers and the drop out group by the facet level characteristic adaptation

The results of the t-test analysis at the facet level are reportedin Table 28. The analysis at the facet level of characteristic adaptations confirmed the previous reported differences on the broad domains between the two groups. For the *Self-control,* treatment completers had significant more adaptive levels on *Emotional Regulation* (M= 2.66, SD = .47) compared to the drop out group (M= 2.15, SD= .38), t = (315) = -8.54, p < .001) and on *Effortful Control* (M = 2.47, SD = .55) compared to the drop out group (M = 1.97, SD = .48), *t* (315) = -8.97, p < .001.

The dropout group had significantly lower means and were thus more dysfunctional on all five facets of the *Identity* domain than treatment completers. For example, treatment completers had significantly higher mean levels on *Stable self-image* (M = 2.38, SD = .56) than the drop out group (M = 2.83, SD = .54), *t* = (316) = -7.24 p < .001 as well as on *Self-Respect* (M = 2.66, SD = .59) compared to the drop out group (M = 3.01, SD = .56), *t* (323) = -5.37, p < .001. (see Table 30 for all facets). In regards to *Relational* capacities,the drop out group had more maladaptive (lower) scores than the treatment completers on *Intimacy* (M= 2.58, SD= .46) vs. (M = 2.92, SD = .51), t (323) = -6.20, p < .001; *Enduring relationships* (M = 2.55, SD = .50) vs. (M = 2.88, SD= .51), t (323) = -5.80, p < .001; and *Feeling recognized* (M = 2.54, SD = .52) vs. (M = 2.92, SD = .48), t (323) = -6.80, p < .001). Furthermore, the two groups differed significantly on the *Responsibility* domain, with the dropout group scoring significantly lower on *Responsible industry* (M = 2.40, SD = .50) than treatment completers (M = 2.83, SD = .57), *t* (321) = -7.08, p < .001) and on *Trustworthiness* (M = 2.60, SD = .47), as compared to completers (M = 2.91, SD = .52), *t* (322) = -5.54, p < .001.

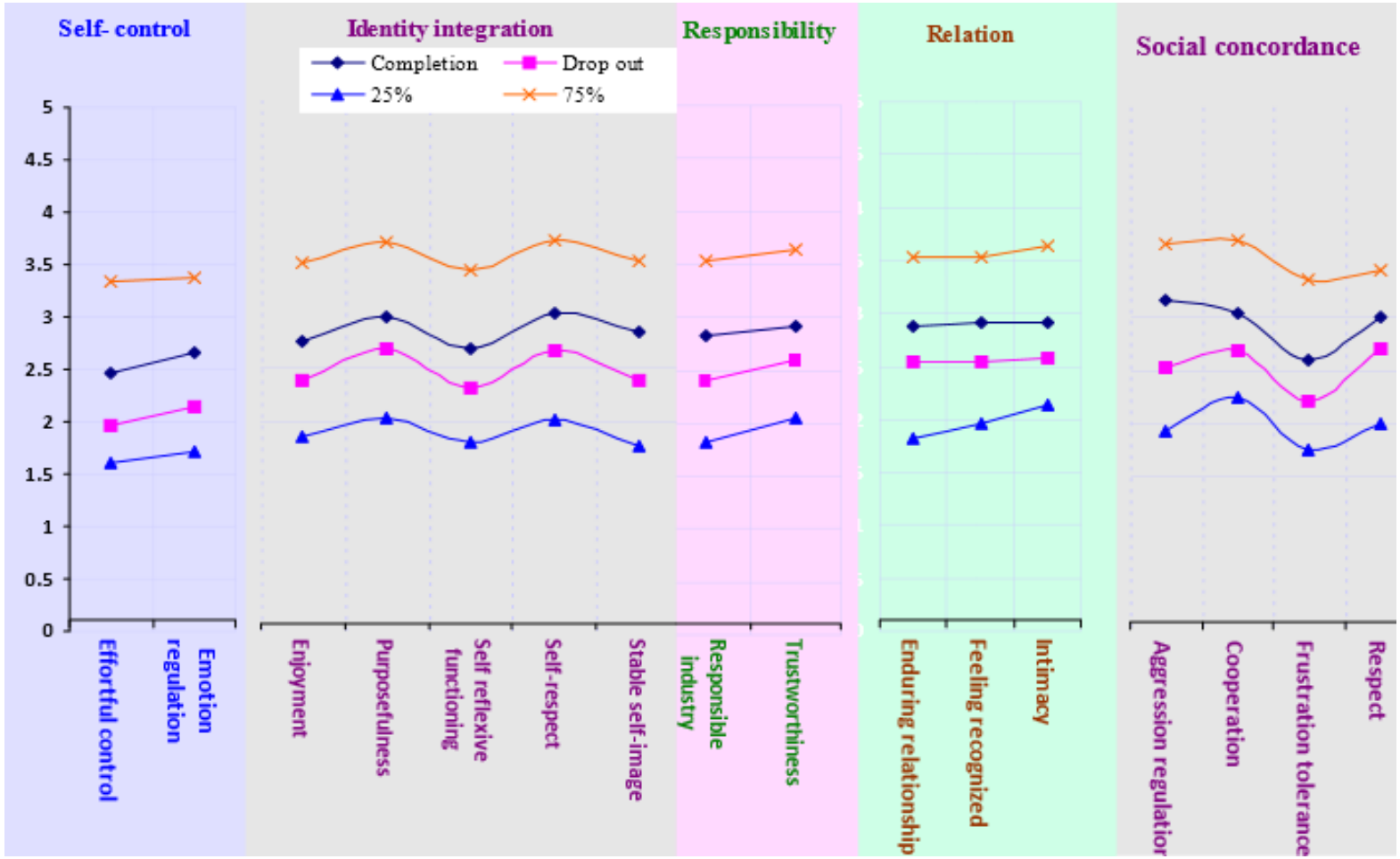


Figure 9. Means, 25th and 75th percentile of broad and facet level characteristic adaptations of completers and drop outs

Finally, the drop out group had significantly more dysfunctional levels on all facets of *Social concordance* domain. For example, the drop out group had a significantly lower mean on *Aggression Regulation* (M = 2.53, SD = .71) compared to treatment completers (M= 3.17, SD = .57), t (322) = -8.70, p < .001. Likewise, for *Frustration tolerance the* drop out group scored significantly lower (M = 2.21, SD = .38) than the completers (M = 2.59, SD = .47, t = -7.89, p = .028), see Table 30, on page 177 for the results on the rest of the *Social concordance* facets.

5.4.3 Hierarchical multiple logistic regressions of characteristic adaptations and treatment status

5.4.3.1 Broad characteristic adaptations as predictors of treatment completion

Analytic Strategy

The third set of analyses looked at the degree to which variables that significantly differed between treatment completers and drop out group predicted treatment drop-out. Out of the 338 participants in the inpatient sample, 315 were included in this analysis, since 23 (6,8%) had missing cases and were excluded from the analysis. For these analyses, a hierarchical logistic regression analysis was utilized, with treatment status as the dependent variable. Motivational and treatment engagement variables were entered into the first block and the predictors of interest, characteristic adaptations, into the second block. Variables significant in the initial (univariate) regression analyses were simultaneously entered into the final logistic regression model (*Enter mode*), designed to determine whether these predictors were independently associated with treatment drop-out exceeding the engagement and motivational variables. Multicollinearity diagnostic statistics for the logistic model (tolerance values and VIF) were examined to exclude

multicollinearity, due to interdependency between the predictor variables. The classification accuracy of the final model was calculated. All analyses were performed using SPSS, version 20.0. The variables that significantly differed between the treatment completers and the drop out group, were tested for their predictive capacity.

Hypothesis Testing

The overall effect of the predictor variables upon the dependent variable of treatment completion status was statistically significant. Prediction success overall was 86% (88.3% for treatment completers and 83.1% for drop out group). A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between treatment completers and the drop out group (χ^2 =23.58, df =5; p <.001). Nagelkerke's R^2 of 67.1 indicated that the predictors with the control variables explained about 67% of the total variance in treatment drop-out. Table 29, page 175, details the final model utilized to address the final part of research question 3. From the predictors included in the multivariate analysis, the Wald criterion demonstrated that only the two broad characteristic adaptations S*elf-Control* and *Social Concordance* made a significant (independent) contribution to the prediction (see Table 29, page 175). The final model indicated that after adjusting for the other predictors, those with higher maladaptive range of *Self-Control* were almost three times more likely to drop-out compared to those without [OR] =2.73, Wald =6.09, p =.014, 95% CI [1.2, 6.0]. It can be seen from the data in Table 29 that when *Social Concordance* is raised by one unit, the odds ratio is 2.21 times as large and therefore individuals with more adaptive functioning on *Social Concordance* were 2.21 more times likely to complete treatment, [OR] =2.21, Wald =4.12, p =.042, 95% CI [1.0, 4.7].

The standardized beta-coefficients, Wald statistics and significance levels for the predictors included in the two models are displayed in Table 31. From the first block of predictors, treatment engagement and specifically *Counselling Rapport* [OR] =1.15, Wald =9.24, p =.002, 95% CI [1.0, 1.2] and *Treatment Participation* [OR] =1.21, Wald =13.82, p < .001, 95% CI [1.0, 1.3], were the most influential predictors of treatment completion. Surprisingly, no significant differences were found for *Treatment satisfaction* in the multivariate analyses. Individuals with high levels on *Counselling Rapport* and on *Treatment Participation* were 1.15 and 1.21 respectively more times likely to complete treatment.

From the motivational variables, *Treatment Readiness* OR] =1.15, Wald =10.27, p < .001, 95% CI [1.0, 1.2], and *Treatment Needs* [OR] =.915, Wald =6.54, p =.011, 95% CI 0.8, 0.9], accounted for a significant amount of variance. For every unit increase on *Treatment Needs* the odds ratio was 0.915, that is, for an additional unit of *Treatment Needs* the odds for completing treatment is lower by 8.5%. Finally, as indicated in the Table 29 (below), no significant differences were found between the two groups on the psychological wellbeing. *Anxiety* and *Depression* were not significant predictors in the final model.

Table 29. Multivariate logistic regression model for predicting treatment completion by broad domains characteristic adaptations (N=315)

	Unadjusted						*Adjusted model (stepwise entry)*					
	β	SE	Wald χ^2	P	OR	95% CI	β	SE	Wald χ^2	P	OR	95% CI
Demographic variables												
Age of birth	0.55	0.20	7.83	.005	1.05	(1.01, 1.09)	0.31	.03	1.04	.307	1.03	(0.9, 1.5)
Gender	-0.17	0.31	0.33	.564	0.83	(0.45, 1.53)	0.36	0.53	0.47	.492	1.43	(0.5, 4.0)
Marital Status	1.28	0.76	2.80	.094	1.13	(0.97, 1.32)	---					
Educational level	-	0.08	0.46	.496	0.94	(0.80, 1.11)	---					
Prim Drug of Choice	-0.92	0.46	3.95	.047	0.39	(0.81, 1.06)	---					
Injected	0.22	0.59	0.14	.706	1.25	(0.39, 3.98)	---					
Legal problems	0.27	0.27	0.99	.420	1.31	(0.76, 2.26)	---					
Psychological wellbeing												
Depression	-0.07	0.01	25.18	.000	0.92	(0.89, 0.95)	0.19	0.35	.304	.582	1.01	(0.9, 1.0)
Anxiety	-0.06	0.01	17.91	.000	0.93	(0.91, 0.96)	-.00	0.03	0.02	.866	0.99	(0.9, 1.0)
Motivational variables												
Desire for help	0.05	0.02	4.52	.033	1.05	(1.00, 1.11)	-0.93	0.05	3.26	.071	0.91	(0.8, 1.0)
Treatment readiness	0.23	0.29	62.63	.000	1.25	(1.18, 1.33)	0.15	0.04	10.27	.001	1.15	(1.0, 1.2)
Pressures for treatment	-0.02	0.01	2.14	.143	0.97	(0.95, 1.00)	.022	0.02	0.81	.368	1.02	(0.9, 1.1
Treatment needs	-.067	.019	12.81	.000	.935	(0.90, 1.00)	-.089	0.01	6.54	.010	0.91	(0.8, 1.0)
Treatment engagement												
Counselling rapport	0.31	0.34	81.36	.000	1.36	(1.27, 1.46)	0.14	0.04	9.24	.002	1.15	(1.0, 1.2)
Treatment participation	0.28	0.35	64.77	.000	1.32	(1.23, 1.42)	0.19	0.52	13.82	.000	1.21	(1.0, 1.3)
Treatment	0.22	0.02	63.37	.000	1.25	(1.18, 1.32)	0.07	0.04	2.84	.092	1.07	(0.9, 1.1)

satisfaction												
Characteristic adaptations broad domains (IV)												
Self-Control	1.51	0.19	60.73	.000	4.56	(3.11, 6.68)	0.98	0.41	6.09	.014	2.73	(1.2, 6.0)
Identity Integration	1.49	0.22	44.09	.000	4.45	(2.86, 6.92)	-0.30	0.55	0.30	.581	0.73	(0.2, 2.1)
Responsibility	1.14	0.18	39.47	.000	3.12	(2.19, 4.46)	-0.41	0.35	1.37	.240	0.65	(0.3, 1.3)
Relational capacities	1.38	0.21	41.80	.000	3.98	(2.62, 6.06)	-0.22	0.41	0.30	.584	0.79	(0.3, 1.7)
Social concordance	1.48	0.20	54.06	.000	4.42	(2.97, 6.57)	0.80	0.39	4.12	0.42	2.21	(1.0, 4.7)

Key: IV=independent variable, ---- = variables not entered in multivariate model; NS=variables were entered in multivariate model but not selected by stepwise method.
Notes: Sample size for multivariate analyses N=315. Stepwise Forward entry criterion $p<0.05$. Stepwise model $F(8,315) = 21.432$, $p < 0.00$, $R2=0.41$, adjusted $R2=0.39,5$.

5.4.3.2 Facet level characteristic adaptations as predictors of treatment completion

Analytic Strategy

Similar procedures were used to construct the final multivariate logistic regression for the facet level adaptation as predictors of treatment completion. The results obtained from the univariate comparisons, identified six predictors for the multivariate model: *Effortful Control, Aggression regulation, Stable Self Image, Enjoyment, Intimacy, and Respect* (reported in the Table 30). As covariates, beyond *Gender* and *Age*, motivational variables (*Desire for Help, Treatment Readiness, Treatment Needs and Pressure for Treatment*), treatment engagement variables (*Counselling Rapport, Treatment Participation* and *Treatment Satisfaction*) and psychological variables (*Depression* and *Anxiety*), were included into the model with the *ENTER mode* at block one. Variables significant in the initial (univariate) regression analyses were simultaneously entered into the final logistic regression model (*ENTER mode*), designed to determine whether these predictors were independently associated with treatment drop-out exceeding the engagement and motivational variables.

Table 30. Multivariate logistic regression model for predicting treatment completion by facet level characteristic adaptations (N=315)

	Unadjusted						*Adjusted model (Forward stepwise conditional entry)*					
	β	SE	Wald χ^2	P	OR	95% CI	β	SE	Wald χ^2	P	OR	95% CI
Demographic variables												
Age of birth	0.55	0.20	7.83	.005	1.05	(1.01,1.09)	0.39	0.28	1.91	.166	1.04	(0.9, 1.1)
Gender	-0.17	0.31	0.33	.564	0.83	(0.45,1.53)	0.37	0.45	0.68	.408	1.45	(0.5, 3.5)
Marital Status	1.28	0.76	2.80	.094	1.13	(0.97, 1.32)	---					
Educational level	-	0.08	0.46	.496	0.94	(0.80, 1.11)	---					
Prim Drug of Choice	-0.92	0.46	3.95	.047	0.39	(0.81, 1.06)	---					
Injected	0.22	0.59	0.14	.706	1.25	(0.39, 3.98)	---					
Legal problems	0.27	0.27	0.99	.420	1.31	(0.76, 2.26)	---					
Psychological wellbeing												

Depression	-0.07	0.01	25.18	.000	0.92	(0.89, 0.95)	---					
Anxiety	-0.06	0.01	17.91	.000	0.93	(0.91, 0.96)	---					
Motivation												
Desire for help	0.05	0.02	4.52	.033	1.05	(1.00, 1.11)	-.050	.051	.984	.321	1.10	(0.9, 1.3)
Treatment readiness	0.23	0.29	62.63	.000	1.25	(1.18, 1.33)	.159	.046	11.94	.001	1.17	(1.1, 1.3)
Pressures for treatment	-0.02	0.01	2.14	.143	0.97	(0.95, 1.00)	-0.03	0.02	1.91	.167	0.91	(0.9, 1.0)
Treatment needs	-.067	.019	12.81	.000	.935	(0.90, 1.00)	-.096	.033	8.48	.004	.908	(0.8, 1.0)
Treatment Engagement												
Counselling rapport	0.31	0.34	81.36	.000	1.36	(1.27, 1.46)	.195	.048	16.49	.000	1.21	(1.1, 1.3)
Treatment participation	0.28	0.35	64.77	.000	1.32	(1.23, 1.42)	.205	.049	17.42	.000	1.22	(1.1, 1.3)
Treatment satisfaction	0.22	0.02	63.37	.000	1.25	(1.18, 1.32)	.065	0.03	2.79	.095	1.06	(0.9, 1.1)
Characteristic adaptations facet levels (IV)												
Self-Control												
Emotion Regulation	1.84	.263	49.57	.000	6.34	(3.7, 10.6)	---					
Effortful Control	2.13	.297	51.69	.000	8.44	4.7, 15,0	1.54	.482	10.23	.001	4.67	(1.8, 12,0)
Identity Integration												
Self-Respect	1.03	.208	24.80	.000	2.81	(1.8, 4,2)	---					
Stable self-image	1.48	.236	39.51	.000	4.41	(2.7, 7,0)	1.34	.516	6.75	.009	2.62	(0.9, 3.0)
Self - reflective functioning	1.32	.236	31.57	.000	3.77	(2.3, 6,0)	---					

Table 30: Multivariate logistic regression model for predicting treatment completion by facet level characteristic adaptations (N=315) (Cont.)

Enjoyment	1.44	.249	33.70	.000	4.23	(2.6, 6.9)	---					
Purposefulness	1.29	.260	24.92	.000	3.66	(2.1, 6.0)	---					
Responsibility												
Responsible industry	1.43	.230	39.07	.000	4.21 1	(2.6, 6.6)	---					
Trustworthiness	1.24	.243	26.11	.000	3.46	(2.1, 5.5)	---					
Relational capacities												
Intimacy	1.42	.254	31.12	.000	4.13	(2.5, 6.8)	---					
Enduring relationships	1.26	.239	28.13	.000	3.54	(2.2, 5.6)	---					
Feeling recognized	1.53	.256	35.75	.000	4.62	(2.7, 7.6)	---					
Social concordance												
Aggression regulation	1.49	.204	53.67	.000	4.45	(2.9, 6.6)	1.56	.397	16.68	.000	4.76	(2.1, 10,3)
Frustration tolerance	1.99	.302	43.37	.000	7.31	(4.0, 13.2)	---					
Cooperation	1.50	.254	34.98	.000	4.50	(2.7, 7.4)	---					
Respect	1.55	.279	31.00	.000	4.74	(2.7, 8.1)	---					

Key: IV=independent variable, ---- = variables not entered in multivariate model; NS=variables were entered in multivariate model but not selected by stepwise method. Notes: Sample size for multivariate analyses N=315. Stepwise Forward entry criterion $p<0.05$. Stepwise model $F(3,315) = 37.945$, $p < 0.01$, $R^2=0.51.4$, adjusted $R^2=0.69$

Hypothesis Testing

Form the predictors included in the multivariate analysis, only three remained in the multivariate model after forward selection (Table 30, page 177), namely *Effortful Control, Aggression Regulation* and *Stable Self-Image*. A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between treatment completers and the drop out group χ^2 (chi square = 37.945, *df* = 3, p < .001). Nagelkerke's R^2 of .69 indicated a strong relationship between prediction and grouping. In block 0, the probability of a correct prediction was 56.8 %. In the final model, the overall predictive accuracy was 87.0% (89.9% for treatment completers and 83.5% for drop out group).

The Wald criterion demonstrated that *Effortful Control* (p= .001), *Aggression Regulation* (p < .001) and *Stable Self-Image* (p = .009) made a significant contribution to the prediction of treatment completion. EXP(B) value indicated that when *Effortful Control* is raised by one unit, the odds ratio is 4.67 times as large and therefore individuals with higher adaptive levels on *Effortful Control* were 46% more times likely to complete treatment than the group with low adaptive levels, [OR] = 4.67, Wald = 10.231, p =.001, 95% CI [1.81, 12.04].

After accounting for the other predictors in the model, service users with higher more adaptive levels of *Aggression Regulation,* have 4.76-time greater odds to complete treatment than those with low scores. This means that those individuals with high maladaptive range of *Aggression Regulation* have an increased risk to drop-out compared to those without maladaptive functioning on this dimension, [OR] = 4.76, Wald = 16.68, p < .001, 95% CI [2.1, 10.3]. Finally, *Stable Self-Image* was a significant predictor of treatment completion, hence service users with higher adaptive levels on

Stable Self-image have 2.62 time greater odds to complete treatment that those with low scores. Individuals with high maladaptive levels on *Stable Self-image* have an increased risk to drop-out compared to those without maladaptive scores, [OR] = 2.62, Wald = 6.75, p < .009, 95% CI [0.9, 3.0].

The probability of treatment completion is contingent on individuals' engagement levels. As demonstrated in the Table 30, individuals with high scores on *Counselling rapport* were 1.21 time more likely to complete treatment than those with low scores, [OR] = 1.21, Wald = 16.49, p < .001, 95% CI [1.1, 1.3]. Finally, as Table. 30 shows, there were significant differences on the motivational levels between the two groups. Individuals with high scores on *Treatment Readiness* were 1.17 times more likely to complete treatment than those with low *Treatment Readiness*[OR] = 1.17, Wald = 11.94, p =.001, 95% CI [0.1, 1.3]. Individuals with higher score on *Treatment Readiness* were less likely to drop out. Similarly, individuals with higher levels of *Desire for Help* were 1.10 times more likely to complete treatment, than those with low *Desire for Help*. As indicated in the Table 30, (page 177), increased levels of *Treatment Needs* significantly predicted drop out from treatment. For every unit increase on *Treatment Needs,* the odds ratio was 0.908. Finally, no significant difference between the two groups was evident for *Pressures for treatment.*

5.5 Changes on characteristic adaptation from baseline to during process follow up between treatment completers and drop out group

Research Question 4

The aims of this research question were twofold. The first aim was to investigate any potential changes in characteristic adaptations levels during the course of treatment and whether these changes differ between service users who completed treatment and those who dropped out. The second aim of this research question was to examine the clinical significance of these changes in terms of therapeutic gain. For the first aim, in order to assess the degree of potential change of characteristic adaptations in early treatment, initially Paired *t-tests* were utilized from a sub sample (n= 70) with complete data from both assessment points, namely the outpatient preparation phase (baseline: time 1) and inpatient phase (during process follow up: time 2). In order to examine whether there are any significant differences on the degree of changes of characteristic adaptations between the two groups (completers and drop out group), one way a series of repeated mixed measures ANOVA were performed.

Hypothesis

D: It is expected to find differences in the maladjustment levels as measured by pre and during process assessment, as well as between treatment completers and drop out group.

- It is expected that treatment completers will exhibit more functional characteristic adaptations at the baseline and will have higher percentage of clinical change from the dysfunctional levels towards the normative means.

5.5.1 Comparison of characteristic adaptations between baseline and during process follow -up. Paired –t test (N = 70)

Comparisons within groups were performed in order to estimate potential improvement, i.e. whether significant changes on the characteristic adaptations had occurred from baseline to during process follow-up. As shown in Table 31, page 183, there were statistically significant differences between time 1 (baseline assessment outpatient preparation phase) and time 2 (during the process assessment- inpatient treatment) scores for *Self-Control, Identity, Relation and Responsibility,* but not for *Social Concordance,* that remained unchanged at the second inpatient time point. This significant increase of characteristic adaptations scores from the outpatient preparation phase to the inpatient treatment, suggests that individuals, regardless of their treatment status (completed or dropped out), improved their dysfunctional characteristic adaptations (see changes from baseline to during treatment scores in Table 31, page 183).

The use of multiple paired t-tests may have increased the risk of Type-1 error. In order to deal with this, the effect sizes together with p-values are reported in order to illuminate the strength of differences found. On all measurements, except one (Social Concordance), the magnitude of baseline- during differences was smaller in the drop out group compared to completers. The significantly larger effect-sizes for degree of baseline- during process change along with the significant p-values for completers, suggest that the identified pattern of change is valid, and not a consequence of statistical measurement error or the different in group sizes.

More specifically, there was a significant difference in *Self-Control* between baseline (M = 4.04, SD = 0.73) and during process follow up assessment (M = 4.83, SD = 0.74), t (69) = 3.95, $p < .001$). Similarly, significant differences were found in the

Identity domain between baseline (M = 3.74, SD = 0.56) and during process assessment (M = 4.03, SD = 0.58), *t* (69) = - 4.50, p < .001; in the *Relational capacities* (M = 4.06, SD = 0.70) versus (M = 4.21, SD = 0.61), *t* (70) = - 2.16, p = 0.34, and in the *Responsibility* (M= 3.73, SD = 0.74) versus(M= 4.16, SD = 0.75), *t* (69) = - 5.54, p < .001). Finally, no significant differences were reported for *Social Concordance* between the time 1; baseline assessment (M = 5.29, SD = 0.80) and during the process follow-up (M = 5.28, SD = 0.67), *t* (69), p = .140. In accordance with hypothesis four, these findings suggest an improvement of dysfunctional characteristic adaptations during the time period spent in treatment for all broad characteristic adaptations except *Social Concordance*. The analysis at the facet level confirmed the associations found at the broad domains between baseline and during process follow-up. As demonstrated in the Table 31, the results showed that all facet level characteristic adaptations increased significantly at the inpatient assessment point, except for all of the facets of *Social Concordance*.

Table 31. Differences between baseline-and during-treatment scores for domain and facet level characteristic adaptations: Paired t-test results

	Baseline		During treatment			95% CI Mean Difference			
Broad Facets	M	SD	M	SD	n		r	t	df
Social Concordance	5.29	.80	5.28	.67	69	-0.16, 0.18	.53**	.140	68
Aggression regulation	2.72	.66	2.89	.62	72	-0.31, -0.02	.56**	-2.36*	69
Frustration tolerance	2.40	.46	2.45	.50	72	-0.17, 0.0	.49**	-1.06	68
Cooperation	2.86	.54	2.85	.48	70	-0.12, 0.13	.45**	.061	70
Respect	2.92	.50	2.89	.39	72	-0.09, 0.16	.30*	.518	72
Self –control	4.04	.73	4.38	.74	69	-0.50, -0.16	.55**	-3.96**	68
Emotion regulation	2.22	.52	2.45	.50	70	-0.34, -0.08	.44**.	-3.36**	68
Effortful control	2.06	.44	2.24	.43	69	-0.29, -0.07	.46**	-3.33**	68
Identity integration	3.74	.56	4.03	.58	69	-0.42, -0.16	.56**	-4.50**	68
Stable self-image	2.36	.53	2.62	.50	69	0-.39, -0.12	.39*	-3.80**	68
Self-reflexive functioning	2.35	.50	2.49	.48	69	-0.27, -0.01	.36*	-2.08*	69

Self-respect	2.70	.55	2.90	.56	72	-0.32, -0.06	.50**	-2.97*	72
Purposefulness	2.74	.48	2.91	.45	70	-0.28, -0.07	.54**	-3.27*	70
Enjoyment	2.41	.52	2.66	.49	71	-0.38, -0.10	.30*	-3.44*	71
Relational functioning	4.06	.70	4.21	.61	70	-0.29, -0.01	.60**	-2.16*	69
Intimacy	2.68	.52	2.76	.48	72	-0.22, 0.06	.24*	-1.15	72
Feeling recognized	2.64	.52	2.79	.51	72	-0.26, -0.02	.50**	-2.32*	72
Enduring relationships	2.64	.59	2.73	.51	72	-0.21, 0.03	58**	-1.48	72
Responsibility	3.73	.74	4.16	.75	69	-0.59, -0.27	.62**	-5.54**	68
Responsible industry	2.38	.57	2.67	.56	72	-0.41, -0.17	59**	-4.85**	72
Trustworthiness	2.52	.54	2.80	.52	72	-0.40, -0.15	51**	-4.48**	72

* $p < .05$; ** $p < .001$

5.5.2 Patterns of changes from baseline to during process follow-up.

Group comparisons between treatment completers and the drop out group

Analytic Strategy

A series of mixed - measures analyses of variance was conducted to compare scores on the characteristic adaptations between service users who dropped out and those who completed treatment across the two-time periods (time 1- baseline outpatient preparation; and during process follow-up – inpatient treatment). The analysisindicated the degree of change of characteristic adaptations scores over the 2 time periods (*main effect for time*); compared the differences in the characteristic adaptations between treatment completers and drop out group (*main effect for group*) and revealed whether the changes in the characteristic adaptations scores over time were different for the two groups (*interaction effect*). The analyses between treatment completers and drop out group indicated significant advantages of time spent in treatment for the completers compared with drop out group, as shown in the Table 32. The relationship between treatment status (completion or dropout) and time spent in treatment (baseline-outpatient to during process follow up-inpatient) was significant and in the expected direction in

the three out of five characteristic adaptations for mean differences and effect sizes see Table 32, page 186 and Table 34, page 191).

Table 32. Change of characteristic adaptations over time and between groups

	Wilks' Lambda	F	Mean Square	df	Error df	Sig.	Partial Eta Squared
Social Concordance							
Main effect – Time	.998	.118	.032	1	67	.732	.002
Interaction time * Service User Status	.993	.480	.128	1	67	.491	.007
Between-Subjects Effects Service User Status		16.343	16.343	1	67	.000	.167
Self –control							
Main effect - Time	.863	10.602	2.519	1	67	.002	.137
Interaction time * Service User Status	.947	3.763	.894	1	67	.057	.053
Between-Subjects Effects Service User Status		37.164	37.164	1	67	.000	.357
Identity integration							
Main effect - Time	.825	14.241	1.984	1	67	.000	.175
Interaction time * Service User Status	.943	4.074	.568	1	67	.048	.057
Between-Subjects Effects Service User Status		9.166	24.090	1	67	.000	264
Relation							
Main effect - Time	.970	2.117	.371	1	68	.150	.030
Interaction time * Service User Status	.942	4.225	.721	1	68	.044	.058
Between-Subjects Effects Service User Status		8.853	8.853	1	68	.004	.115
Responsibility							
Main effect - Time	.731	24.699	5.237	1	67	.000	.269
Interaction time * Service User Status	.984	1.082	229	1	67	.302	.016
Between-Subjects Effects Service User Status		14.090	10.721	1	67	.000	.174

Hypothesis Testing

Main effects for time

More specifically, three out of five broad domains had a significant *main effect for time* spent in treatment (i.e. the change between baseline and during process follow up), with *Self-control,* Wilks' Lambda = .86, F (1, 67) = 10.60, p = .002, partial eta squared = .14; *Identity* Wilks' Lambda = .82, F (1, 67) = 14.24, p < .000, partial eta squared = .18; and *Responsibility*, Wilks' Lambda = .73, F (1, 67) = 24.69, p < .001, partial eta squared = .27. According to Cohen (1988), partial eta squared values above .14 are considered large effect sizes, indicating significant change with both groups showing an increase in *Self-Control, Identity and Responsibility* scores across the two-time points (see Table 32). No significant *main effect for time* spent in treatment was found on *Social Concordance,* Wilks' Lambda = .99, F (1, 67) = 0.11, p = .732, partial eta squared = .002, and on the *Relational capacities*, Wilks' Lambda = .97, F (1, 68) = 2.17, p = .150, partial eta squared = .03, indicating that the degree of change between baseline and during process follow up was not significant for these two broad domains. These findings contrast the previous Paired t-test results that indicated significant differences in the *Relational capacities* between time 1: baseline and time 2: during the process assessment. This inconsistency may be explained by the significant interaction effect of time and service user status, Wilks' Lambda = .94, F (1, 67) = 4.22, p = .044, explained in more detail in the section interaction effects below.

Main effect for treatment status

The second part of the repeated measure analysis examined the main effect of treatment status (between group comparisons: treatment completers, drop out group). The results indicated that treatment completers had significantly more functional characteristic adaptations in all five broad domains then the drop out group. The main

effect of the between group comparison in *Self-Control* domain was significant, F (1, 67) = 37.16, p < .001, partial eta squared = .35, suggesting significant difference in *Self-Control* scores between the drop out group and treatment completers (see Table 34, page 191). For *Social Concordance*, the *main effect for group* was significant, F (1, 67) = 16.34, p < .001, partial eta squared = .20. This finding suggests a significant difference in *Social Concordance* levels between the two groups, with treatment completers showing higher scores thus being less pathological. Furthermore, the between group comparison indicated highly significant effect for the *Identity* domain, F (1, 67) = 24.09, p < .001, partial eta squared = .24, and *Responsibility* domain, F (1, 67) = 14.09, p< .001, partial eta squared = .17, with treatment completers exhibiting significantly higher adaptation levels over the drop out group (see Table 34, page 191). Finally, a significant main effect was traced between the two groups F (1, 68) = 8.85, p < .004, partial eta squared = .11, suggesting a moderate significant difference in Relational capacities scores between drop out group and treatment completers.

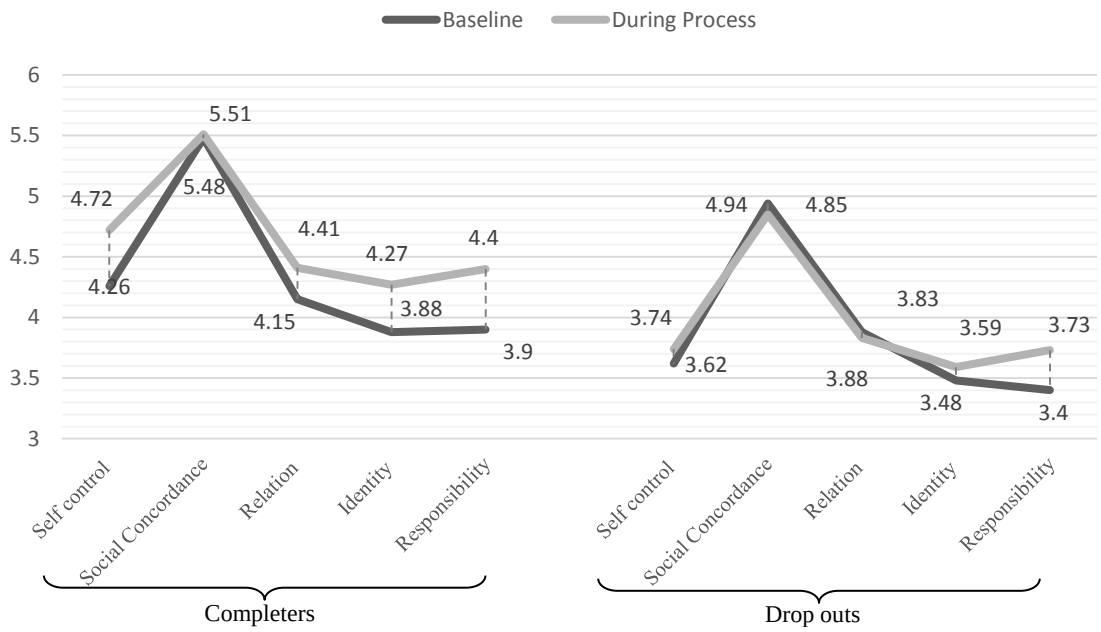


Figure 10. Mean changes from baseline to during process follow-up between treatment completers and drop out group

Table 33. Examination of the interaction effect for the *Relational capacities* (Pairwise Comparisons)

Time	(I) Service User Status	(J) Service User Status	Mean Difference (I-J)	Sig.[b]	95% Confidence Interval for Difference	
					Lower	Upper
1	Drop out	Completion	-.271	.130	-.623	.082
2	Drop out	Completion	-.573[2]	.000	-.854	-.292

Service User Status	(I)Time	(J) Time	Mean Difference (I-J)	Sig.[b]	95% Confidence Interval for Difference	
					Lower	Upper
Drop out	1	2	.044	.712	-.194	.282
Completion	1	2	-.258	.004	-.430	-.086

Interaction effects

The final part of the repeated measure analysis examined interaction effects, i.e. whether the change in the characteristic adaptations scores over time were different for the treatment completers versus the drop out group. The results indicated no significant interaction effects on *Social concordance* Wilks' Lambda = .99, F (1, 67) =.480, p = .441, partial eta squared = .007; *Self-control* Wilks' Lambda = .94, F (1, 67) = 3.763, p = .057, partial eta squared = .053; and *Responsibility* Wilks' Lambda = .98, F (1, 67) = 1.082, p = .302, partial eta squared = .016.

Significant interaction effects were found on *Identity integration* Wilks' Lambda = .94, F (1, 67) = 4.07, p =.048, partial eta squared = .057 and on *Relational capacities* Wilks' Lambda = .94, F (1, 67) = 4.22, p = .044, partial eta squared = .058. For the *Identity integration*, the pattern of change was clear, since the changes between baseline and during process follow-up (Wilks' Lambda = .82, p < .000, partial eta squared = .18)

[2] *The mean difference is significant at the .05 level.
b Adjustment for multiple comparisons: Bonferroni.

Additional command in the SPSS Syntax in order to examine further the interaction effects
/EMMEANS=TABLES(ServiceUserProgress*Time) COMPARE (ServiceUserStatus) ADJ (BONFERRONI)
/EMMEANS=TABLES(ServiceUserStatus*Time) COMPARE (Time) ADJ (BONFERRONI)

and for between group comparison ($p < .001$, partial eta squared = .24) were significant. That is, treatment completers had significant change towards more functional characteristic adaptations from baseline to during process follow-up, and expressed a significantly higher degree of positive change in their Identity integration levels than the drop out group.

For *Relational capacities* the significant interaction effect of time and service user status indicates that the changes in the characteristic adaptations over time are not equivalent between treatment completers and those who dropped out from treatment. Examining the plot of the *Relational capacities*, the mean scores from treatment completion group had an upward trend from baseline to follow-up, towards higher mean score levels. This upward trend to higher scores reflects the degree of change towards more functional characteristic adaptations, closer to the normative mean. In contrast, the mean scores from the drop-out group showed a slight decrease from baseline to during the process follow up, reflecting deterioration on the *Relational capacities* for those who left treatment.

Table 34. Comparisons between drop out group and completers on their mean changes from baseline to during process follow up on the five broad characteristic adaptations (Repeated measures)

		Baseline intake		During process follow up					
Higher Domains	Treatment Progress	Mean	SD	Mean	SD	*t*	F (1,67)	p	η^2
Self-control	Completers	4.26	.726	4.72	.631	-4.23	37.16	.000	.35
	Drop-outs	3.62	.543	3.74	.477	-.088		.384	
Social Concordance	Completers	5.48	.726	5.51	.636	-.030	16.34	.766	.20
	Drop-outs	4.94	.764	4.85	.527	.062		.537	
Identity	Completers	3.88	.548	4.27	.518	-5.07	24.09	.000	.24
	Drop-outs	3.48	.489	3.59	.429	-1.02		.316	
Relation	Completers	4.15	.705	4.41	.615	-3.12	8.53	.004	.11

	Drop-outs	3.88	.693	3.83	.428	0.34		.734	
Responsibility	Completers	3.90	.771	4.40	.741	-5.04	14.09	.000	.17
	Drop-outs	3.40	.566	3.73	.566	-2.48		.021	

These findings suggest that there is significant difference on the degree of change dysfunctional characteristic adaptations between treatment completers and the drop out group. As expected (Hypothesis 4), the overall results of this research question suggest that remaining in treatment (from time 1 to time 2) provides therapeutic gains in terms of change of the dysfunctional characteristic adaptations towards more functional levels. Also, in accordance with the hypothesis 4, the results indicated that service users who completed treatment had more functional characteristic adaptations at the baseline, than the drop out group and improved their dysfunctional levels more than service users who dropped out of treatment.

5.5.3 Clinically significant change of characteristic adaptations: moving from dysfunctional range to the normative mean

The previous analyses showed that the period from time 1 to time 2 is related to improvement of dysfunctional characteristic adaptations for both drop out group and treatment completers. However, the degree of change towards more functional levels was greater for treatment completers and to a lesser degree for the drop out group. Results also showed that treatment completers had less dysfunctional characteristic adaptations at baseline. An important aspect that this question aims to address is whether these changes are meaningful in regards to therapeutic gain and what is the interpretation of this change in clinical terms. To answer this, the criterion of reliable and clinically significant change (Jacobson & Truax, 1991) was applied, to assess the extent to which the improvement of characteristic adaptations was associated with

psychometrically reliable change that moved service users from the patient population towards the normal population.

In order to investigate the clinically significant change for the different facets, calculation of the percentage was conducted for service users who achieved reliable change, the percentage of service users who passed the cut-off point and moved from a dysfunctional range to a normative range, and the percentage of service users who had both reliable change and moved into a normative range as measured by the SIPP-118. Reliable change was calculated using the formula: RC = 1.96 × √ 2(SE)2, with SE = SDclinical × √ 1 – α. The cut-off point for movement into a normative range was computed using the following formula: (SDnormal × Mclinical + SDclinical × Mnormal)/(SDnormal + SDclinical). Means, standard deviations, and alpha scores for the different facets were used from Feenstra, Hutsebaut, et al. (2011). Clinical deterioration was also computed, defined as service users whose score decreased by the reliable change index, towards more dysfunctional levels. Reliable change indexes and cut-off values for the different facets are presented in Table 35.

$SE_{meas} = \sigma_{meas} = SD * \sqrt{1 - r_{11}}$	where SD = the standard deviation of the measure, and r_{11}= the reliability (typically coefficient alpha) of the measure

A Reliable Change Index (RCI) is computed by dividing the difference between the baseline and during treatment scores by the standard error of the difference between the two scores. If the RCI is greater than 1.96, then the difference is reliable, whereby a change of that magnitude would not be expected due to the unreliability of the measure. Conversely, if the RCI score is 1.96 or less, then the change is not considered to be reliable, hence it could have occurred just due to the unreliability of the measure. See

Table 35 for alpha scores, means and standard deviations of clinical and non- clinical population and cut-off point into a normative range and reliable change index scores.

$$RCI = (posttest - pretest) / SE_{meas}$$

Table 35. Alpha scores, means and standard deviations of clinical and normal population and cut-off point into a normative range and reliable change index scores

	a	SD Normal	M Normal	SD clinical	M Clinical	Cut off	Reliable Change
Self-control							
Emotion Regulation	0.79	0.61	3.30	0.58	2.34	2.80	.73
Effortful Control	0.80	0.56	3.16	0.52	2.13	2.62	.63
Identity Integration							
Self-Respect	0.83	0.59	3.30	0.60	2.81	3.05	.68
Stable self-image	0.77	0.67	3.24	0.65	2.48	2.86	.86
Self – reflexive functioning	0.75	0.56	3.20	0.54	2.53	2.95	.74
Enjoyment	0.77	0.62	3.34	0.60	2.37	2.85	.80
Purposefulness	0.76	0.49	3.34	0.56	2.67	3.02	.76
Responsibility							
Responsible industry	0.76	0.50	3.44	0.59	2.42	2.97	.80
Trustworthiness	0.76	0.42	3.49	0.56	2.57	3.09	.76
Relational capacities							
Intimacy	0.81	0.60	3.17	0.54	2.72	2.93	.65
Enduring relationships	0.75	0.58	3.31	0.60	2.75	3.03	.83
Feeling recognized	0.76	0.56	3.23	0.59	2.64	2.94	.80
Social Concordance							
Aggression regulation;	0.84	0.45	3.66	0.73	2.78	3.32	.80
Frustration tolerance	0.73	0.56	2.96	0.50	2.41	2.67	72
Cooperation	0.78	0.51	3.28	0.58	2.93	3.11	.75
Respect	0.69	0.45	3.34	0.51	2.97	3.02	.78

5.5.4 Graphical representation of Clinical Significance, Cut of Points and Reliable Change

Clinical significance is graphically presented by superimposing normative group information on a graph showing time 1: baseline outpatient and time 2: during the process individual's scores (see Figure. 11, page 195). The horizontal axes indicate the time 1 (baseline outpatient preparation) scores; the vertical axes indicate the time 2 (during the process follow-up inpatient treatment) scores. The horizontal red line represents the cut-off point +1 SD normative-group. Scores above the cut-off point for each scale are considered to be within the normal range of scores. The diagonal line from the lower left to the upper right is the line of no change. Scores that fall on the diagonal line are the same at both Time 1 (baseline outpatient) and at the Time 2 (during process follow-up). Data points in the upper left triangle that are higher at Time 2 than at Time 1, demonstrate an improvement from the outpatient preparation phase to the inpatient treatment. Scores in the lower right triangle which are lower at Time 2 than at Time 1 indicate deteriorated conditions from the outpatient preparation phase to the inpatient treatment. The dotted blue lines to the left and the right of the diagonal line signify the reliable change index band, set at an *RCI score of 1.96 standard errors of measurement* around the line of no change. Individual scores within the RCI band (scores falling within the area from the right blue line to the left) have not reached reliable change, while scores falling outside of the RCI band have shown reliable change.

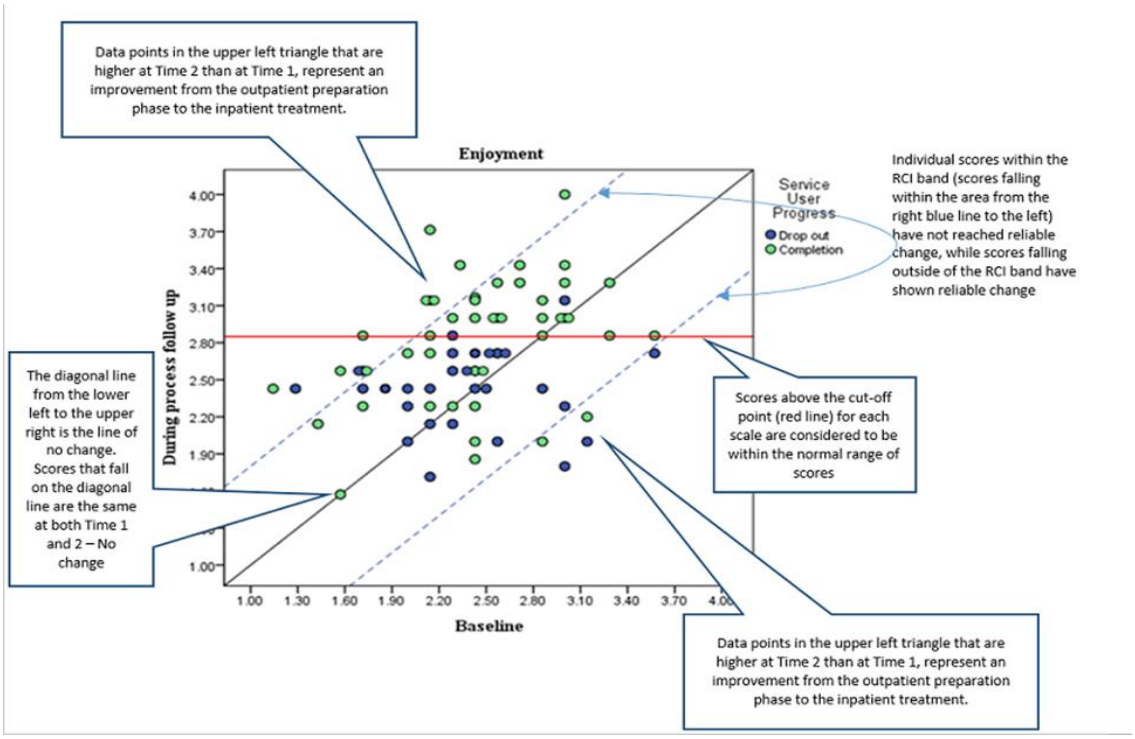


Figure 111. Graphical Representation of Clinical Significance Cut of Points and Reliable Change

Table 36. Facet level characteristic adaptations, degree of change from baseline to during process follow up, Clinically significant change (n = 70)

	N	**Stable N (%)**	**Uncertain Change** Improved	Worsened	**Pass the normative cut-off N (%)**	**Reliable Change N (%)**	**Clinical significant change N (%)**	**Clinical deterioration N (%)**
Self-Control								
Emotion Regulation	70	8 (11.4%)	42 (60.0%)	20 (28.6%)	18 (25.7%)	11 (15.7%)	7 (10.0%)	3 (4.3%)
Effortful Control	69	7 (10.1%)	44 (63.7%)	18 (26.9%)	9 (13.0%)	12 (17.4%)	3 (4.3%)	2 (2.9%)
Identity Integration								
Self-Respect	72	5 (6.9%)	42 (58.3%)	26 (34.7%)	33 (45.8%)	13 (16.0%)	8 (11.1%)	2 (2.8%)
Stable self-image	69	9 (13.0%)	41 (59.4%)	19 (27.5%)	25 (36.2%)	9 (13.0%)	9 (13.0%)	2 (2.9%)
Self - reflex functioning	69	10 (14.5%)	36 (52.2%)	24 (34.8%)	12 (17.4%)	11 (14.5%)	5 (7.2%)	4 (5.8%)
Enjoyment	71	9 (12.7%)	46 (64.8%)	16 (22.5%)	27 (38.0%)	11 (15.5%)	6 (8.5%)	5 (7.0%)
Purposefulness	70	7 (10.0%)	42 (60.0%)	22 (31.4%)	26 (37.1%)	5 (7.1%)	3 (4.3%)	1 (1.4%)
Responsibility								
Responsible industry	72	12 (16.7%)	45 (62.5%)	15 (20.8%)	23 (31.9%)	11 (15.3%)	7 (9.7%)	1 (1.4%)
Trustworthiness	72	5 (6.9%)	49 (68.1%)	18 (25.0%)	18 (25.0%)	10 (13.9%)	4 (5.6%)	2 (2.8%)
Relational capacities								
Intimacy	72	4 (5.6%)	37 (51.4%)	31 (43.1%)	28 (38.9%)	12 (16.7%)	7 (9.7%)	7 (9.7%)
Enduring relation	72	10 (13.9%)	37 (51.4%)	25 (34.7%)	17 (23.6%)	9 (12.5%)	4 (5.6%)	4 (5.56%)
Feeling recognized	72	4 (5.5%)	41 (56.94%)	28 (38.89%)	24 (33.33%)	8 (11.11%)	4 (5.56%)	3 (4.2%)
Social concordance								
Aggression regulation	72	2 (2.8%)	38 (53.8%)	32 (44.4%)	19 (26.4%)	13 (18.1%)	7 (9.7%)	1 (1.4%)
Frustration tolerance	72	7 (9.7%)	38 (51.4%)	26 (38.9%)	21 (29.2%)	6 (8.3%)	4 (8.3%)	2 (2.8%)
Cooperation	70	11 (15.7%)	30 (42.9%)	30 (42.9%)	24 (34.3%)	7 (10.0%)	5 (7.1%)	7 (10.0%)
Respect	72	11 (15.2%)	26 (36.1%)	36 (50.0%)	24 (33.3%)	6 (8.3%)	4 (5.5%)	3 (4.2)

5.5.4.1 Group differences on Self-Control

In regards to the facets of *Self-Control,* on *Emotional Regulation,* around half of the participants moved towards improvement, ¼ passed the normative cut off, 15% pass the reliable change, and 7% passed the clinically significant level (Table 36). The higher proportion of completers (17/46; 37% of subgroup) passed the cut-off point on *Emotional Regulation,* compared to non-completers (1/24; 4.2% of subgroup), and met the criteria for reliable change, with completers (9/46; 16.9%) and the drop out group (2/24; 8.3%). Likewise, on *Effortful Control*, a greater percentage of treatment completers passed the cut-off point (9/46; 19.6%) and the criteria for reliable change (10/46; 21.7%), than the drop out group (0/24; 0%) and (2/24; 8.3%) respectively. Finally, treatment completers had higher proportion of clinical significant change on both *Emotional Regulation* (6/46; 13%) and *Effortful Control* (3/46; 6.5%), than the drop out group with (1/24; 4.2%) and (0/24; 0%) respectively.

Figure 11, page 194, indicates the outcomes matrix (i.e. a scatter plot) showing the relation between levels of dysfunctional characteristic adaptation at baseline and during process follow up for treatment completers (light green) and drop out group (dark blue). The diagonal solid line signifies no change. The parallel diagonal dotted lines indicate the reliable change index limits, as calculated for each facet from the Reliable Change Index (RCI) formula. Changes made by service users falling between these lines are too small to be considered as reliable. The area above the y axis diagonal dotted line demonstrates a clinically significant improvement, while the area below the x-axon diagonal dotted line demonstrates clinical deterioration. The horizontal red line represents the cut-off point as indicated by the formula of cut-off point. A large majority of the non-completers on *Emotional Regulation* (10/24; 41.7%) and on *Effortful Control* (12/24; 50%) did experience change towards improvement (shown by dark blue dots

above the solid diagonal line). A small proportion 4.3% of the total sample were clinically deteriorated on the *Emotional Regulation* facet, a percentage shared equally in both groups 4.2% in the drop out group and 4.4% in completers, while 8.3 % of the total sample clinically deteriorated from *Effortful Control*, all belonging to the drop out group.

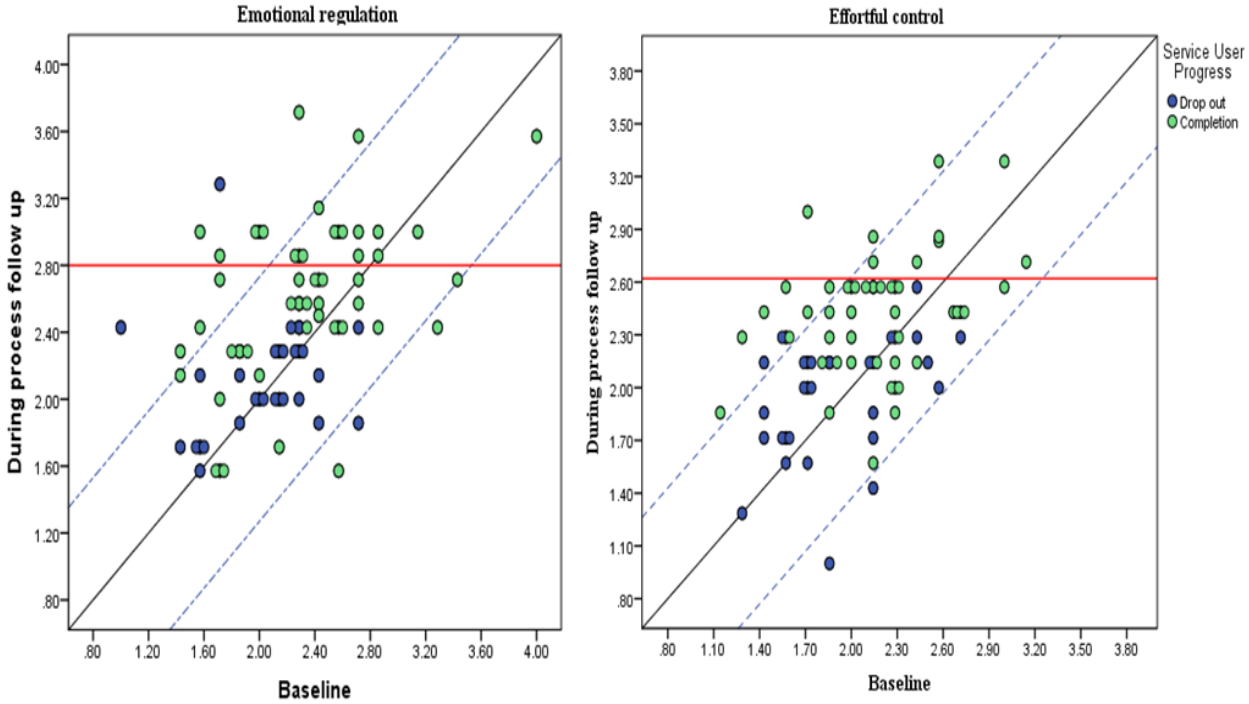


Figure 12. Reliable chance, cut-off point and clinical significant change for Emotional regulation and Effortful control

5.5.4.2 Group difference on Identity Integration

Levels towards improvement for the overall sample on the facets of *Identity integration*, ranged from 52% *Self-reflexive functioning* to 60% *Purposefulness*. The rates of individuals passing the normative cut off ranged from 12 (17.4%) *Self- reflexive functioning* to 33 (45.8%) and *Self-Respect* (see Table 36, page 195 for details).

Comparing the two groups, the completer group had a higher percentage of passing the cut-off point on all facets, *Self-Respect (SR:* 26/46; 56.5%), *Stable Self-Image* (SSI: 24/46; 52.2%), *Self-Reflexive Functioning* (SRF: 12/46 26.1%), *Enjoyment* (EN: 5/46; 54.3%) and *Purposefulness* (PU: 22/46; 47.8%) than the drop-outs with (SR: 7/24; 28%), (SSI: 1/24; 4.2%), (SRF: 0; 0%), (EN: 2; 8.0%) and (PU: 4; 16.7%). For the *Self-Respect* facet 8/72 (11.1%) of the overall sample had clinical significant change, from those 4/46(8.7%) were from the treatment completers group and 4/24 (16%) were from the drop out group.

For the *Stable self-image* 9/69 (13.0%) passed the clinical significance cut off for the overall sample, with 1/24 (4.2%) from the drop out group and 8/46 (17.4%) from treatment completers. As it can be seen in the figures, for the rest of the facets of *Identity Integration* (SRF, EN, and PU), none of the drop-out group passed the horizontal dotted line, indicating that 0% had clinically significant change, while treatment completers group had clinical significant change of SRF 5/46 (10.9%), EN 6/46 (13.0%) and 3/46 (6.5%) for PU. Finally, comparing the two groups, for the SR facet 56.5% of treatment completers and 28% of the drop out group passed the normative cut off mean, for SSI 52.2% of treatment completers and only 4.2% of drop out group passed the normative mean. Finally, for SRF, 26.1% of treatment completers and 0% from the drop out group passed the normative mean.

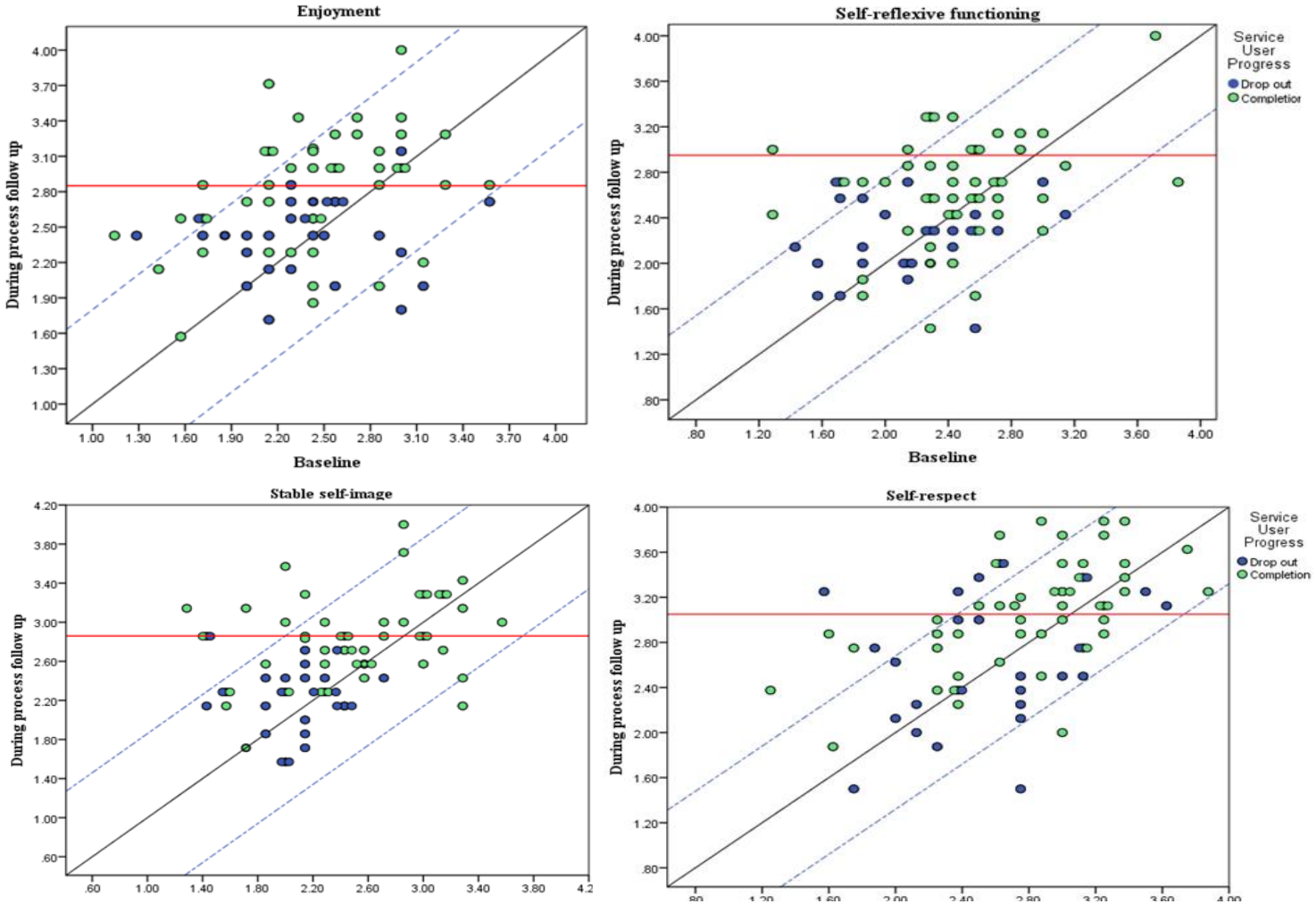


Figure 13. Reliable chance, cut-off point and clinical significant change for Enjoyment, Self-reflexive functioning, Stable self-image and Self-respect

5.5.4.3 Group differences on Responsibility

For the *Responsibility* facets, from the overall sample on the *Responsible industry* (RI) 23/72 (31.9%) and for the *Trustworthiness* (TR) 18/72 (25.0%) passed the normative cutoff point, and 11/72 (15.3%) and 10/72 (13.9%) respectively passed the reliable change index. As can be seen in the figures, the vast majority who passed the cut off point (the vertical red line) was from the treatment completer group for both RI 19/47 (40.4%) and TR 17/47 (36.2%), while only 4/25 (16.0%) for RI and 1/25 (4.0%) for TR passed the cut-off point from the drop out group. In the reliable change index the drop out group had higher percentage of change RI: 4/25 (16.0%) and TR: 4/25; (16.0%), a the completer group with RI: 7/47 (14.9%) and TR 6/47 (12.8%). The clinical significance for the overall sample on RI was 7 (9.7%), 6 from treatment completers and 2 from the drop out group; while for TR the overall clinical significance was 4 (5.6%), all from the treatment completer group. Finally, only one individual clinically deteriorated in RI from the drop out group, and two individuals clinically deteriorated in TR one from drop out and one from completion group.

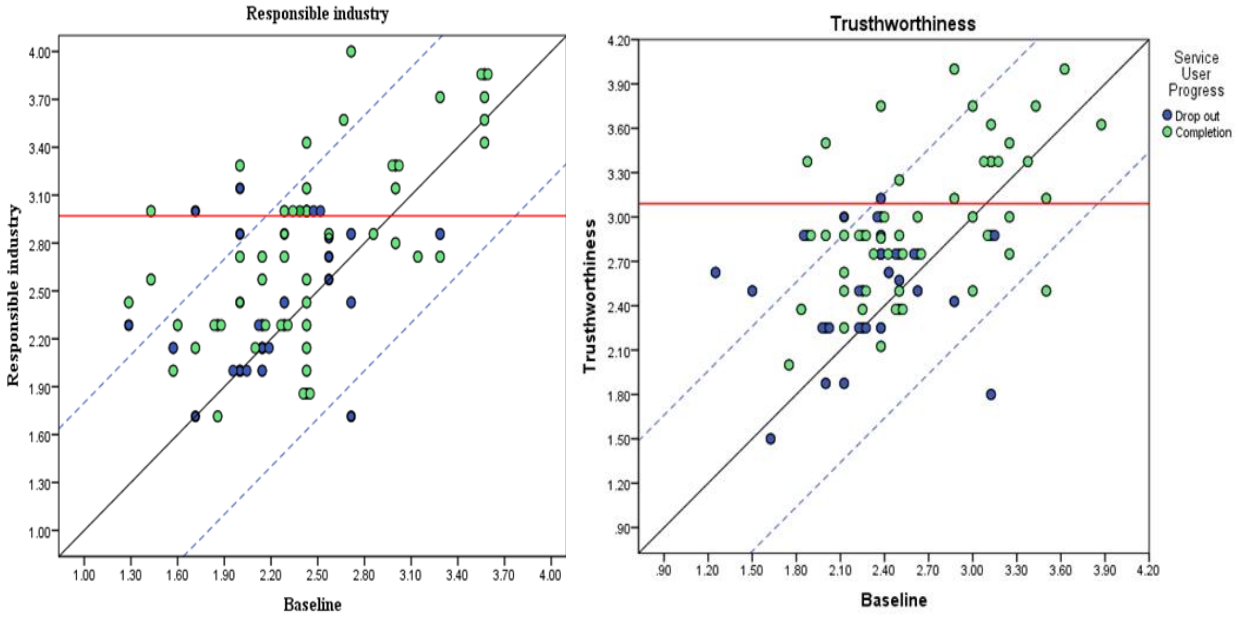


Figure 14. Reliable chance, cut-off point and clinical significant change for Responsible industry and Trustworthiness

5.5.4.4 Group differences on Relational Functioning

From the overall sample, 28/72; (38.9%) for *Intimacy* (IN), 17/72; (23.6%) *Enduring Relationship* (ER) and 24/72; (33.33%) *Feeling Recognized* (FR) passed the cut off point. As Figure shows, a much greater percentage of completers pass the cut-off point on IN: (25/47; 53.2%); ER: (14/47; 29.8%) and FR: (21/47; 45.7%) than the drop out group with IN: (3/25; 12%); ER: (3/25; 12%); and FR: (3/25; 12%), as well as met the criteria for reliable change, with completers for IN: (10/47; 21.3%), ER: (6/47; 12.8%) and FR: (7/47; 15.2%) while drop out group IN: (2/25; 8.0%), ER: (3/25; 12%) and FR: 1/25; 4.0%). Consequently, treatment completers had also greater percentage of clinical significant change on IN, ER and FR then the drop out group (0/24; 0%).

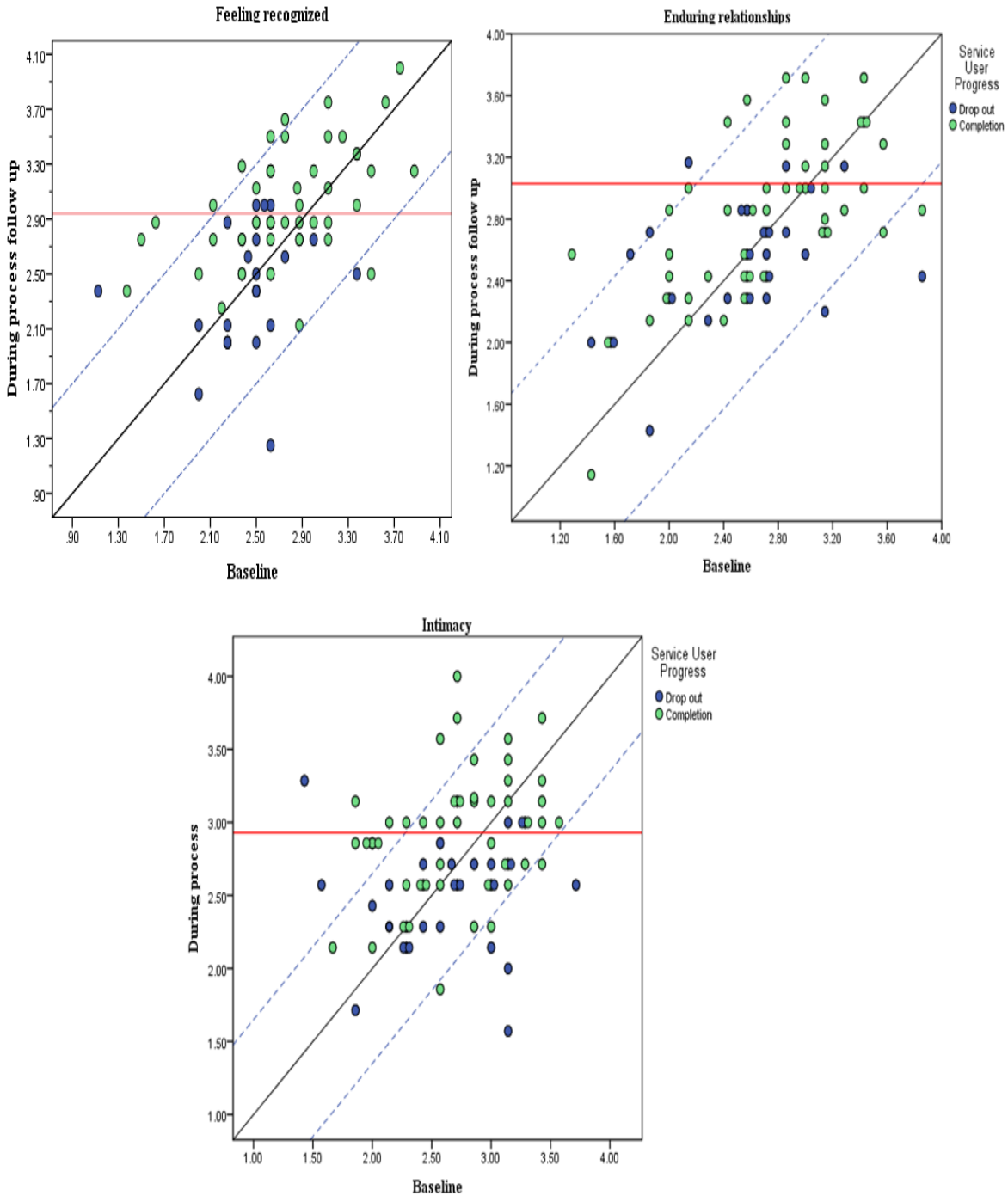


Figure 15. Reliable chance, cut-off point and clinical significant change for Feeling recognized, Enduring relationships and Intimacy

5.5.4.5 Group differences on Social Concordance

The overall sample that passed the normative cut off point for the facets of *Social Concordance* (SC) was 19/72 (26.4%) for *Frustration Tolerance* (FT); 21/72 (29.2%) for *Aggression Regulation* (AR); 24/70 (34.3%) for *Cooperation* (CO); and 24/72 (33.3%) and for *Respect* (RE). For the reliable change index in the overall sample was FT: 13/72 (18.1%), AR: 6/72 (8.3%); CO: 7/70 (10.0%) and for RE: 6/72 (8.3%). As shown in the figure below for the facets of *Social Concordance*, treatment completers group were predominantly higher on both, passed the normative cut of point (above the vertical red line) and had greater percentage of reliable change (above the dotted-up line), thus had greater proportion of clinical significant change. More specifically, the proportion of treatment completers that passed the normative cut of point was much greater AR: 18/46 (39.1%), FT: 19/47 (41.3%), CO: 19/46 (41.3%) and RE 19/46 (40.4%) than the drop out group.As shown in the figures, only one individual passed the normative cutoff point (above the vertical red line) in the AR: 1/24 (4.2%); two individuals for the FT 2/25 (8.0%); and five for both CO: 5/24 (20.8%) and RE: 5/25 ; (20%). Likewise, major differences were found on the reliable change index between the two groups. Treatment completers had higher proportion on all *Social Concordance* facets with AR: 10/46 (21.7%) vs 3/24 (12.5%) of the drop out group, FT 5/47 (10.6%) vs 1/ 25 (4.0%), CO: 5/46 (10.9%) vs 2/ 24 (8.3%) and RE: 4/47 (8.5%) vs 2/25 (8.0%). Thetreatment completer group also had a relatively moderate clinical significant change with AR: 7/46 (15.2%), FT: 4/47 (8.5%), CO: 4/46 (8.7%) and RE 3/46 (6.4%), whereas the drop out group had only one individual in CO facet: 1/24 (4.2%) and one on the RE 1 (4.0%).

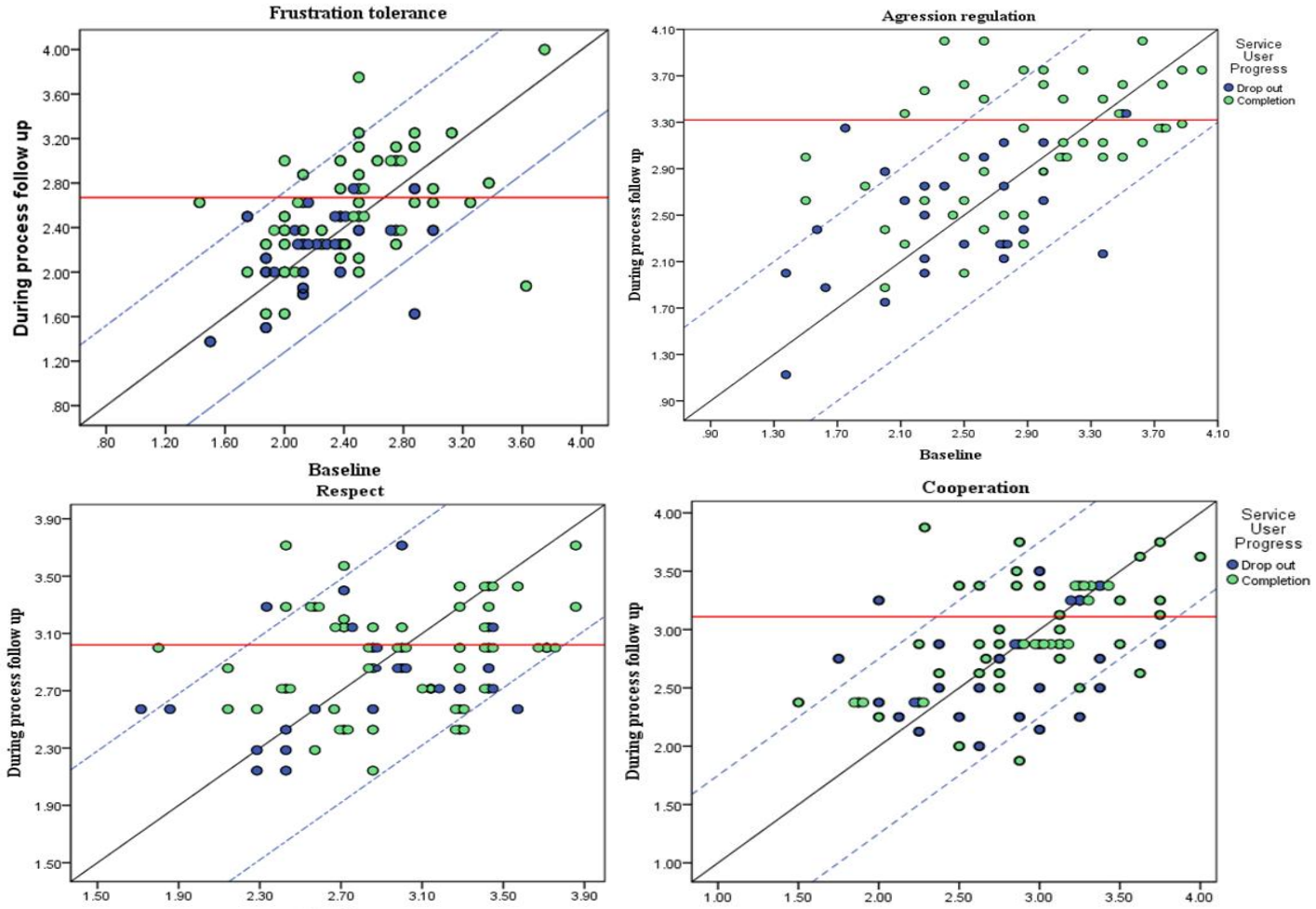


Figure 16. Reliable chance, cut-off point and clinical significant change for Frustration tolerance, Aggression regulation, Cooperation and Respect

Summary of main findings

The first aim of this research question was to examine whether there are differences in the maladjustment levels between baseline and during process follow up, exploring the malleability of characteristic adaptations under intense treatment. Considering the malleability and contextual sensitivity of characteristic adaptations, it was expected (Hypothesis 4A) a certain degree of improvement towards more functional levels from baseline to during process follow up. This hypothesis was partially confirmed, since the results indicated that the main effect for time in treatment between time 1 (baseline outpatient) to time 2 (during process follow up inpatient) was related to significant improvement of the dysfunctional levels of *Self-Control, Identity and Responsibility* but not for *Social Concordance and Relational capacities*. These findings suggest that maladaptive personality functioning as measured by SIPP -118, is changeable during treatment. Also, the findings indicated that service users who completed treatment had more functional characteristic adaptations at the baseline than the drop out group and also, improved their dysfunctional levels more than service users who dropped out from treatment.

The second aim of this research question was to examine the degree of change towards more functional levels between treatment completers and drop outs on the basis of baseline and during process follow up. This would indicate whether remaining in treatment and completing it provides any therapeutic value in regards to change in personality functioning comparing to leaving treatment prematurely. The findings from the analyses exploring the magnitude of baseline – during process differences indicated a significant improvement for all broad characteristic adaptations except *Social*

Concordance domain. Results showed that scores on *Self - Control, Responsibility, Identity and Relational Functioning* significantly increased, except *Social Concordance* that remained unchanged after treatment exposure. The biggest mean difference was found on *Responsibility* and *Identity* domains.

5.6 Overall summary of the results

Findings from this chapter indicated that certain dysfunctional characteristic adaptations are associated with treatment initiation (Hypothesis: A), with drop out (Hypothesis: C), and that specific characteristic adaptations influence diverse indicators of treatment engagement (Hypothesis: B).Furthermore, findings indicated that during treatment dysfunctional characteristic adaptations may change towards more functional and close to the normative means levels (Hypothesis: D), and this is more possible for those who complete treatment.

5.6.1 Main findings regarding Hypothesis A

The first step of this treatment process study was to examine whether personality traits and characteristic adaptations influence treatment initiation, by examining whether there are any significant differences between individuals who initiated treatment and those who dropped out early on. In the first part of the examination (Hypothesis A1,), findings did not confirm the hypothesis that personality traits would reliably predict treatment initiation or drop out. Although the treatment initiation group had significantly higher mean on *Conscientiousness* and *Openness* and lower on the *Neuroticism* domain than the drop-out group, these associations failed to reach significant levels in the multivariate model. However, results indicated significant differences between early drop out and treatment initiation group in lower order traits. *Depression*, a facet of *Neuroticism*, and *Action*, a facet of *Openness*, were the only

variables that remained significant predictors in the multivariate analysis. In addition, the particular facets of *Openness, Neuroticism* and on *Conscientiousness* were shown to make aunique contribution to predicting treatment initiation beyond examination of the higher order traits. In the second part of the first hypothesis (Hypothesis A2), findings revealed the significant role of characteristic adaptations in treatment initiation. Four out of five broad domains of characteristic adaptations were significantly different between the drop out and treatment initiation groups, whereby low levels on the *Social Concordance* domain remained a strong predictor of early drop out even when adjusted for all other covariates. As expected, individuals characterized by lacking the ability to withhold aggressive impulses towards others, and having difficulty in collaborating, were significantly more likely to drop out early on. Likewise, at the facet level, the findings showed that individuals with low levels on *Purposefulness* (the capacity to make life meaningful by creating the means and opportunities for achievement and organising time in line with one's goals), on *Aggression Regulation* (the ability to withhold aggressive impulses towards others and on *Respect* (have the capacity to value someone's individual needs and personal identity), were significantly less likely to initiate treatment.

5.6.2 Main findings regarding Hypothesis B

Confirming the important role of characteristic adaptations in treatment initiation, the subsequent step was to examine their role for treatment engagement (Hypothesis B) in the inpatient setting. Findings indicated that more dysfunctional characteristic adaptations were associated with less treatment engagement, whereas variations in the engagement indicators were predicted by specific characteristic adaptations. More specifically, among the broad characteristic adaptations, dysfunctional levels on *Social Concordance, Self-Control, Relational Capacities* and

Responsibility predicted less *Treatment Participation*, while dysfunctional levels of *Self-Control* and *Relational Capacities* were significant predictors of low *Counselling Rapport*. Dysfunctional levels of *Relational Capacities* predicted low *Treatment Satisfaction*. From the facet level, less adaptive levels on *Self - Reflective Functioning, Aggression Regulation* and *Enduring Relationships* were significant predictors of low *Counselling Rapport,* while *Emotional Regulation, Intimacy, Trustworthiness* and *Respect* were significant predictors of low *Treatment Participation.* Finally, lower levels on *Intimacy* and *Cooperation* were significant predictors of low *Treatment Satisfaction*.

5.6.3 Main findings regarding Hypothesis C

Analyses for Hypothesis C examined the role of characteristic adaptation on treatment completion. Findings indicated that more functional levels of S*elf-Control* and *Social Concordance* from the broad characteristic adaptations were significant predictors of treatment completion. Higher maladaptive range on these two characteristic adaptations predicted drop out. Similarly, at the facet level, the findings indicated that *Effortful Control* and *Aggression Regulation* facets from *Self-Control* and *Social Concordance* respectively, were significant predictors of treatment drop out.

5.6.4 Main findings regarding Hypothesis D

The first aim of this hypothesis was to examine whether there are differences in the maladjustment levels between baseline and during process follow up, exploring the malleability of characteristic adaptations under intense treatment. Considering the malleability and contextual sensitivity of characteristic adaptations, a certain degree of improvement towards more functional levels from baseline to during process follow up was expected (Hypothesis 4). This hypothesis was partially confirmed, since the results indicated that the main effect for time in treatment between time 1 (baseline- outpatient)

to time 2 (during process follow up inpatient) was related to significant improvement of the dysfunctional levels of *Self-Control, Identity and Responsibility* but not for *Social Concordance and Relational capacities*. These findings suggest that maladaptive personality functioning, as measured by SIPP-118, is changeable during treatment. Also, the findings indicated that service users who completed treatment had more functional characteristic adaptations at the baseline than the drop out group, and have also improved their dysfunctional levels more than service users who dropped out from treatment.

The second aim of this hypothesis was to examine the degree of change towards more functional levels between the treatment completers and the drop out group on the basis of baseline and during process follow up. This was expected to indicate whether remaining in treatment and completing it provides any therapeutic value in regards to change in personality functioning comparing to leaving treatment prematurely. The findings from the analyses exploring the magnitude of baseline – during process differences indicated that scores on *Self - Control, Responsibility, Identity and Relational Functioning* significantly increased, except *Social Concordance* that remained unchanged after treatment exposure. The biggest mean differences were found on the *Responsibility* and *Identity* domains.

These findings shed light on the predictive power of characteristic adaptations on treatment initiation, engagement and completion, as well as the importance of capturing these individual differences early on, since there are malleable to time and context. Delineating the effect of characteristic adaptations on treatment engagement and their sensitivity to change under intense treatment, may provide the basis for enhancing

treatment specificity through individualized interventions that are scientifically-driven and empirically-validated, which will be explored further in the discussion section.

Table 37. Key hypothesis findings

Key finding 1	**Higher maladaptive scores on personality traits were not consistently associated with treatment initiation** - Findings did not confirm the hypothesis that personality traits would reliably predict treatment initiation or drop out. Although, treatment initiation group had a statistically significantly higher mean on *Conscientiousness* and *Openness* and lower on the *Neuroticism* domain than the drop-out group, these associations did not reach significant levels at the final multivariate model. At the lower order personality traits, *Depression* was the only predictor remained significant in the final model.
Key finding 2	**Dysfunctional characteristic adaptations were significantly associated with treatment initiation** - Four out of five broad the domains of characteristic adaptations were significantly different between drop out and treatment initiation groups, *Social Concordance* domain remained strong predictor of early drop out, even when adjusted for all other covariates. As expected, individuals characterized by lacking the ability to withhold aggressive impulses towards others, and having difficulty in collaborating, were more likely to drop out. At the facet level, the findings showed that dysfunctional levels on Purposefulness, Aggression Regulation and *Respect* made a significant contribution to the prediction of treatment drop out.
Key finding 3	**Dysfunctional characteristic adaptations were significantly associated with lack of treatment engagement. Service users with high levels on treatment engagement had significantly more functional personality characteristics. Also, different characteristic adaptations impact diverse indicators of treatment engagement** - Several characteristic adaptations were significant predictors at diverse indicators of treatment engagement. At the broad characteristic adaptations, higher maladaptive levels on *Social Concordance*, *Self-Control*, *Relational Capacities* and *Responsibility* predicted low *Treatment Participation*, while dysfunctional levels on *Self-Control* and *Relational Capacities* predicted lower levels of *Counselling Rapport*. Finally, maladaptive levels of *Relational Capacities* predicted low

	Treatment Satisfaction. From the facet level, higher maladaptive levels on *Self - Reflective Functioning, Aggression Regulation* and *Enduring relationships* were significant predictors of low *Counselling Rapport*, and higher maladaptive levels on *Emotional regulation, Intimacy, Trustworthiness* and *Respect* predicted low levels on *Treatment Participation*. Finally, dysfunctional levels on *Intimacy* and *Cooperation* were predictors of low *Treatment Satisfaction*.
Key finding 4	**Dysfunctional characteristic adaptations were negative prognostic indicators of treatment completion.** - Findings indicated that dysfunctional levels on *Self-Control* and *Social Concordance* from the broad characteristic adaptations were significant predictors of drop out from treatment. Similarly, at the facet level, the findings indicated that dysfunctional levels on *Effortful Control* and *Aggression Regulation* facets from *Self-Control* and *Social Concordance* respectively, were significant predictors of treatment drop out.
Key finding 5	**There was a significant improvement in the maladjustment levels from baseline to during process follow up.** - Treatment completers had higher percentage of significant clinical change from the dysfunctional levels towards the normative means than the drop out group. - There was significant improvement of the dysfunctional characteristic adaptations between baseline and during the treatment process and this was significantly higher for the treatment completion group. Service users who completed treatment, as compared to those who dropped out, had more functional characteristic adaptations at the baseline and there was a higher percentage of service users who passed the cut off point, the reliable change as well as significant clinical improvement.

Chapter 6: Discussion

Overview

This chapter involves an evaluation of the study findings placing them in the context of the existing evidence base, the added value and the potential contribution to the academic and to the clinical field. The chapter begins with an overview of the key findings. The implications of these findings for theory development and clinical practice are then discussed along with study limitations, conclusions and future research directions.

6.1 Summary, rationale and key study findings

Two developments in the field of clinical research have prompted the work described in this study. The first development refers to a growing interest in personality research on the dimensional approach to personality functioning, and on the disentanglement of the predisposed tendencies from their behavioural phenotypes, characteristic adaptations in general clinical research (Krueger & Eaton 2010; Livesley, 2010; Rounsaville et al., 2002; Widiger & Simonsen,2005) and in the substance misuse field (Skodol et al., 1999; Verheul & van den Brink, 2000b;). Moreover, the overlapping symptomatology between diagnostic categories, heterogeneity within categories and the subjectivity of the diagnostic criteria of the assessment tools (Morey et al., 2016; Wagner, Lloyd, & Gil, 2002; Widiger & Simonsen, 2005), has led several authors to suggest that the categorical model should be re-conceptualized by including progressive methods of dimensional assessment (Ball, 2005; Clark et al. 2014; Flynn & Brown, 2008 : Jackim, 2005; Krueger et al. 2007; Lowe & Widiger, 2009, Verheul, 2001;) and discriminating normal and abnormal personality traits (Clark, 2007; Livesley, 2007; Samuel et al., 2010 , Trull & Durrett, 2005; Widiger & Clark, 2000).

As described in more detail in Chapter 3, the dimensional traits-based conceptualization may provide more reliable scores, disentangle significant overlap between categories, elucidate heterogeneity within categories and reveal valuable information regarding lower-order traits and symptoms (Lowe & Widiger, 2009; Trull & Durrett, 2005). Thus, disentangling traits from disorders based on a continuum of their intensity and severity indicates the clinical utility of dimensional approach as it may improve individualized assessments, enhance treatment specificity and facilitate appropriate personality matching interventions.

The second development concerns a shift in research attention towards during treatment process evaluations and the development of interventions tailored to individual needs. As discussed in Chapter 2, although most treatment evaluations have focused on outcome indicators and treatment retention, recent research started exploring the 'black box of treatment'[3] and treatment process variables that influence individuals' engagement in treatment. This study is informed by these developments and goes one step further by bringing together these two lines of research. Through consecutive steps of the treatment journey, this study examined the effects of service users' dimensional personality functioning on treatment initiation during the early stages of treatment, treatment engagement mid-period in treatment and treatment completion, the final stage. Finally, this study examined the sensitivity of characteristic adaptations during intense treatment of substance misuse, whether the levels of change personality dysfunction reach significant clinical improvements, and if the levels differ between those completing or dropping out from treatment.

[3] According to the Treatment Process Model (Simpson, 2001) described analytically in Chapter 3 'The Treatment Process Model'

For this purpose, a longitudinal multisite design was utilized using baseline and during process measures consisted of three phases. The first phase involved 217 service users from five outpatient preparation treatment centres to examine whether personality structure (traits) and personality functioning (characteristic adaptations) influence treatment initiation. The second phase involved 338 service users from seven inpatient services associated with the outpatient services to examine firstly, whether personality functioning influence treatment engagement and secondly, whether it predicts treatment completion. The final, third phase, involved a sub-set of 70 cases who had completed longitudinal data relating to both outpatient and inpatient phases, in order to assess the changes in characteristic adaptations between baseline and during treatment assessments, as well as between those who completed treatment and those who did not.

From the clinical research perspective, the study was designed to introduce an innovative conceptual framework based on dimensional diagnostic indicators to see if these might contribute to the identification of individual attrition vulnerabilities. The study set out to discover whether the disentanglement of maladaptive traits from diagnostic categories and the clinical significance of characteristic adaptations would assist in the identification of potential obstacles of treatment engagement and provide the basis for contemporary individualized personality matched interventions. By integrating two different lines of research on personality and engagement, this study attempted to identify key ingredients underlying treatment engagement and explore behavioural phenotypes that could enhance treatment response specificity according to clients' unique needs. Overall, confirming the main hypothesis of this study, the findings indicated that higher levels of dysfunctional characteristic adaptations negatively affect treatment initiation, engagement and treatment completion.

6.2. Discussion of main findings

6.2.1 Personality traits as a predictor of Treatment Initiation

The hypothesis that dysfunctional levels of personality traits, as measured by the TPQue, would be significant predictors of treatment initiation was not supported, with few exceptions. As there are no studies examining personality traits and treatment initiation[4], previous studies that examined the relation of broad personality domains and relapse had reported that low *Conscientiousness, Agreeableness* and *Extraversion* and high *Neuroticism* tended to be strong predictors of relapse in individuals following treatment for alcohol and substance abuse (Bottlender & Soyka 2005; Fisher, Elias & Ritz, 1998). The current study found that although there were differences between the treatment initiation and drop out group, with low *Conscientiousness*, *Openness* and high *Neuroticism* associated with early drop out, their predictive power did not reach significant levels in the multivariate model. Also, no association of *Extraversion* or *Agreeableness* with treatment initiation was found. Miller (1991) supported that *Extraversion* and *Conscientiousness* is positively associated with treatment outcome, (Miller, 1991). In contrast, individuals with low *Extraversion* experience difficulties in interpersonal relationships, which may consequently hinder treatment progress (Ball, 2005; Miller, 1991).

Likewise, previous studies have shown that high *Conscientiousness* has been related to treatment adherence to medical services, treatment and psychotherapy attendance (Christensen & Smith, 1995; Miller et al., 2006; Rhodes, Courneya, & Bobick, 2001). Contrasting these findings, this study found no positive or negative association of *Extraversion* or *Conscientiousness* with treatment initiation. These were

[4] As a reminder treatment initiation is defined in this study as the completion of the preparation phase, while non-treatment initiation is equated as early drop out from the outpatient preparation phase.

unexpected findings since it has been argued that individuals with low levels of *Conscientiousness* tend to be challenging, competing and are expected to exhibit an array of treatment-disruptive and interfering behaviours (Widiger & Presnall, 2013).

Thus, it may be that although low levels of *Extraversion* and *Conscientiousness* may influence treatment progress, at the early stages of treatment other factors may have more important role for the individuals' treatment initiation. In this study, the assessment of personality traits was conducted at the very first contacts of the individuals with the treatment provider. Thus, the influence that it could have on the later phases of treatment was not captured here. However, considering the stability of the five broad domains of personality as measured by the TPQue, individuals with low *Extraversion or Conscientiousness*, did not have less chances to initiate treatment than those with high levels.

Since the examination of personality traits on treatment initiation is understudied, previous studies on treatment outcome have reported mixed findings on the role of *Neuroticism*, with some studies reporting significant predictive power of *Neuroticism* (Geerts & Bouhuys, 1998; Joyce, Mulder, & Cloninger, 1994; Tome, Cloninger, Watson, & Isaac, 1997), while other found no such relationship (Bagby et al., 1995; Boyce & Parker, 1985; Sato et al., 1999). A more recent study examined the association between personality traits and treatment outcome in patients with major depressive disorder (Kushner, Quilty, Uliaszek, McBride & Bagby, 2016). Conducting a series of multiple mediation models to examine the influence of personality traits and treatment outcome, findings indicated that higher *Neuroticism* was the only trait that had direct effect on predicting poorer treatment outcome (Kushner et al., 2016). The evidence from the current study provides some support to previous findings, since high

Neuroticism was a marginally significant predictor of early drop out. Individuals who initiated treatment had significantly lower levels of *Neuroticism* than the drop-out group. According to the FFM, a person with higher levels of *Neuroticism* is perceived as being anxious, worrisome, depressed, being over stressed, and having poor impulse control.

Since Miller (1991) provided some anecdotal evidence based on experiential knowledge of the complexities of low *Openness* in treatment process, no studies have found an association with low *Openness* and treatment drop out. Interestingly, in this study, low *Openness* was related with premature drop out even though it failed to reach significant levels in the multivariate model.

The facet-level analyses added additional insight into the differences between treatment initiation and early drop out group. *Depression,* a facet of *Neuroticism* and *Action,* a facet of *Openness,* were the only variables that remained significant predictors in the multivariate analysis. Further, the particular facets of *Openness*, *Neuroticism* and *Conscientiousness* were shown to have their own unique contribution to predicting treatment initiation beyond examination of the higher order traits.

Action, a dimension of *Openness,* remained a significant predictor of early drop out in the final model. Individuals with maladaptive low *Openness* tend to be extremely rigid in their thoughts, ideas, or beliefs (Piedmont et al., 2009), and are characterized by difficulties in identifying and describing subjective feelings and may have a restricted imaginal capacity (Taylor & Bagby, 2013). Low levels of *Action* indicate the negative pole of an active, participating and energetic attitude (Berghuis et al., 2012) and has been referred to as (phlegmatic) or inactivity (Buss & Plomin, 1984). These findings indicate the important role of *Action* at the early stages of treatment. That is, an active

participation at the early phase of treatment, significantly increases the chances to initiate treatment.

The analyses of personality traits of the facet level in this study indicated that *Vulnerability* and *Depression*, both facets of *Neuroticism,* are significant predictors of early drop out. The drop out group had significantly higher levels on *Vulnerability* and *Depression* than the treatment initiation group. These findings indicate that general susceptibility to stress, and a tendency to experience feelings of guilt, sadness, despondency and loneliness, are significant negative predictors of treatment initiation. Thus, it can be understood that both depressive tendencies and vulnerability to stress are risk factors for drop out during the early phase of treatment. However, the prediction power was moderate too weak.

The analyses of the facet level also revealed some unexpected findings. For example, *Impulsivity,* a lower dimension of *Neuroticism,* has been commonly reported in previous studies to be related with failure to initiate treatment (see for review; Poling, Kosten & Sofuoglu, 2007). Unexpectedly, in this study no such relationship was found between *Impulsivity* and treatment initiation. A possible explanation of this contradiction with the background literature may be that in the above mentioned reviewed studies that reported significant association of *Impulsivity* related traits with early drop out, the sample was consistent by individuals with cocaine dependence, while the majority of the sample of this study (90%) had heroin as a primary drug of choice. It might be that the individuals with cocaine addiction differ from those with heroin addiction in the capacity to withhold their impulsive tendencies. Considering the urgency to use and excessive craving for cocaine use, there might be differences at the early phases of treatment between these two groups.

Another possible explanation is that the difference may be due to trait-state artifact hypothesis that refers to the artificially inflated traits by the state-induced distortion of the individuals' current condition. Personality scales may be more sensitive to state changes (Verheul & van den Bink, 2000), and thus measures of *Neuroticism* or affective stages may be sensitive to mood alternations. This might be more prominent for individuals with cocaine addiction, who may exhibit exacerbation of impulsive acting out behaviours and rapid mood changes, all of which is a common symptomatology of cocaine withdrawal.

In Chapter 3, it was discussed that the construct of *Impulsivity* is a multidimensional construct marked by significant overlap among theoretical conceptualizations and measurements (Acton, 2003; Kambouropoulos & Staiger, 2007; Krueger et al., 2007). For example, the differences between *Impulsivity* and *Rush Impulsiveness* is that they have different neural pathways that influence drug dependence (e.g. Dawe, Matthew, & Loxton, 2004; de Wit & Richards, 2004; Moeller et al., 2001). In this line, *Reward Drive* is more associated with "heightened sensitivity to unconditioned and conditioned rewarding stimuli" (Dawe et al., 2004; p. 1399), while *Rash Impulsiveness* involves a decreased ability to control behaviour or stop drug use regardless of the future negative consequences of that behaviour (Dawe, Gullo, & Loxton, 2004; Dawe, Matthew, & Loxton, 2004). Unfortunately, this cannot be confirmed, since the majority of the above-mentioned studies used FFM as an assessment tool that does not discriminate these two similar but fundamentally different forms of *Impulsivity*. This study, however, provides significant insight in these fundamentally different forms of Impulsivity, since in accordance with Verheul's

hypothesis, *Rash impulsiveness* is highly related to the *Social Concordance* domain that was found to significantly predict treatment drop out.

Thus, it can be said that differences in drop out that have been reported in studies between heroin and cocaine addiction in the early phases of treatment, may be related to the *Rash Impulsiveness.* This is a topic with great clinical significance, given that confirmed treatment interventions should target these differences between substance use disorders, as it appears that they are responsible for the high attrition rates of cocaine dependent individuals in the early phase of treatment.

Based on the above findings, although personality traits provide sufficient information to scetch individuals profile that can be used for clinical purposes, their ability to predict treatment initation is low. The findings of this study are in line with previous research that shows that individuals with substance use disorders are characterized with low *Conscientiousness* and *Openness* and high on *Neuroticism*. However, the hypothesis that more maladaptive levels on these domains will be associated with non- treatment initiation was not fully supported. In contrast to the expectations that the association of personality traits with drop-out may represent a reliable predictor of early drop out and decode major individual vulnerabilities, this was not supported in this study. As expected and in line with previous studies, lower levels of *Conscientiousness* and *Openness* and higher levels of *Neuroticism* were associated with drop out, however these associations failed to reach significant levels at the multivariate analyses. Although the treatment initiation group had statistical significant mean differences on all five broad domains, only *Neuroticism* domain remained significant and the prediction power was rather weak. Also, findings indicated that early

signs of depression and inactivity or non-participation are significant predictors of early drop out from treatment.

These findings are encouraging for the clinical arena, since they do not confirm the hypothesis that personality dispositions alone set the individual in a predetermined negative prognostic outcome. They do however provide useful data regarding individual personality description that could guide clinical interventions targeting individuals' personality structure.

6.2.2 Characteristic adaptations predictors of treatment initiation

The hypothesis A2 of the research question one, examined the predictive role of broad and facet level characteristic adaptations in treatment initiation or early drop out. As expected, specific dysfunctional characteristic adaptations levels were associated with early drop out. Findings indicated that overall individuals who initiated treatment had more functional characteristic adaptations than the drop out group.

6.2.2.1 Social Concordance domain and facet levels

As stated in chapter 3, *Social Concordance* domain is aligned with the majority of the dimensional models of *Behavioural Disinhibition*. Low *Social Concordance* facets and domain scores have shown predictable pattern of correlations with the dissocial, interpersonal disesteem of DAPP-BQ (Livesley & Jackson, 2002), that are aligned with Widiger and Simonsen's dimensions of lack of compliance, antagonism, low agreeableness of Five Factor Model (FFM; McCrae & Costa, 1990); and low *cooperativeness* and reward dependence of Cloninger's Temperament and Character Inventory (TCI; Cloninger, Przybeck, Svrakic & Wetzel, 1994). These domains overall are associated with suspiciousness, rejection, exploitation, aggression, antagonism,

callousness, deceptiveness, and manipulation, being over trusting, compliant, agreeable, modest, dependent, diffident, and empathic.

Previous studies from diverse research fields consistently indicated that *Hostility* is associated with early drop out from treatment (Joe, Simpson and Broome,1999; Lang & Belenko, 2000; Meier & Barrowclough, 2009; Simpson et al., 1995). These results are in line with those of previous studies: *Social Concordance* domain emerged as the strongest predictor of *Treatment Initiation* in the univariate analyses and was the only who remained significant predictor at the multivariate analyses. As expected, individuals characterized by lacking the ability to withhold aggressive impulses towards others, and having difficulty in collaborating, were more likely to not initiate treatment and leave early on.

Furthermore, the analyses at the facet level demonstrated consistent patterns. *Aggression Regulation, Frustration Tolerance, Purposefulness, Cooperation* and *Respect* were all significant predictors of drop out in the univariate analysesand maladaptive levels on *Aggression Regulation, and Respect* remained significant predictors of drop out in the multivariate model. These results suggest that individuals who have aggressive impulses towards others (*Aggression Regulation*) and don't value other people needs and personal identity (*Respect*) are less likely to initiate treatment and to drop out early on from treatment. This is not surprising considering that psychosocial treatment requires a certain degree of relatedness and interaction with fellow-peers and the therapeutic staff.

6.2.2.2 Self-Control domain and facet levels

Self- control domain, defined as *the capacity to tolerate, use and control one's own emotions and impulses*, and is associated with *Negative Emotionality* scale from the SNAP (Clark and Watson, 2008); *Negative Affectivity* (PID-5; Personality Inventory for DSM-5; Krueger, et al., 2011); *Affect Liability* (DAPP; Livesley & Jackson, 2002); *Emotional Stability* (Widiger et al., 1994); and the broad domain *Neuroticism* (FFM; McCrae & Costa, 1990). This fundamental domain of personality was titled *Emotional Instability* by Goldberg (1993) and *Negative Emotionality* by Clark and Watson (2008) and as mentioned in the literature review chapter, is generally associated with the broad *Internalized Spectrum*. Previous studies from diverse clinical population have reported that high levels of *Emotional Dysregulation* related characteristics are associated with non-compliance, denial and behavioural disengagement (Aluja et al., 2007; Gudjonsson & Sigurdsson, 2003; Gudjonsson et al., 2002; Mullins-Sweatt & Widiger, 2007).

Self-Control domain was significantly different between the two groups, indicating that higher capacities to tolerate, use and control one's own emotions and impulses were associated with treatment initiation, although thisfailed to reach significant level after adjusting for the other covariates. As mentioned previously in regards to the *Negative Emotionality* (see Neuroticism, page, 81), the evidence is inconclusive with treatment progress. Likewise, in this study highly dysfunctional levels on *Emotional Regulation,* a facet of *Self-Control,* despite being significant at the univariate level, did not remain a significant predictor of drop out in the multivariate analyses. This was an unexpected finding since *Emotional Regulation,* a facet of *Self-Control* domain (SIPP), is highly positively correlated with *Depression,* a lower order personality trait of *Neuroticism* (TPQue), and *Depression* was the only lower order trait

that remained a significant predictor after all other covariates were entered into the model.

One possible interpretations of this inconsistency is that *Emotional regulation* measures the capacity to tolerate and manage emotions and control their intensity, course, and expression, while *Depression* as a lower order trait (TPQue) measures the tendency to experience feelings of guilt, sadness, despondency and loneliness. It may be that during the early phases of treatment depressive symptomatology such as chronic feelings of guilt, sadness, despondency and loneliness plays a more important role for dropping out from treatment than the capacity to tolerate and manage the emotions and control their intensity, course, and expression. The particular combination of *Negative emotionality* and dysfunctional *Emotional regulation* negatively predicts treatment initiation than any of these two separately.

The particular combination indicates that individuals lack the capacity to tolerate, manage and control their depressive symptomatology. Especially in early phases of substance misuse treatment, individuals pass through a period of intense mood swings, as a result of major life changes associated with physical (detoxification, withdrawal); emotional (intense craving, emotional reactions due to increased awareness of the negative consequences of drug misuse, developed strategies to cope with emotional instability); and behavioural (ceasure of acting out impulsive behaviours, changes in their life style and daily organization and programming) challenges.

Another potential interpretation is that *Depression,* as measured by TPQue in this context, in early phase of SUD treatment, may represent an escalation of the dysfunctional levels of certain traits, thus reflecting more the current condition of individuals' affective state rather than their stable traits. This assumption is in line with

the diathesis-stress-model which conceptualizes personality as the diathesis and stress (being in treatment environment) is a moderator that precipitates the depressive symptoms. Although TPQue questionnaire is a valid and reliable tool for capturing individuals' personality traits and has received empirical support, the research is very limited on SUD samples. Thus, personality assessments should be used with caution when assessing SUDs, especially in the early stages of treatment, since personality assessment findings may be coloured or distorted by the individual's mood state.

This implies that for individuals with SUD, emotional dysregulation and behavioural disinhibition early in treatment alters the levels of personality traits. However, this remains to be confirmed and validated by empirical research. This interpretation is in line with the current diagnostic classifications manual, i.e. DSM, which offers a guideline for clinicians to postpone making any additional diagnosis in the early stages of SUD treatment.

6.2.2.3 Identity domain and facet levels

In regard to the domain *Identity integration*, although the two groups differed significantly, this difference failed to reach significant levels in the multivariate analysis. Those with higher *levels on the ability to see oneself and one's own life as stable, integrated and purposive* were more likely to initiate treatment than those with more dysfunctional levels. According to Bastiaansen, De Fruyt, Rossi, Schotte and Hofmans (2013), the SIPP-118 *Identity Integration* domain captures most of the self-components in the DSM-5, section III; Identity and Self-direction. Other investigators have found stronger associations among SIPP-118 and DAPP-BQ higher order domain scales (e.g. between DAPP-BQ Emotional Dysregulation and SIPP118 *Identity integration*;

Berghuis, Kamphuis, & Verheul, 2014). In a previous study, *Identity* correlated with internalizing dysfunction (i.e. *Self-Defeating, Lack of Self-Direction, Ineffectiveness, Pessimism*).

At the facet level of *Identity Integration, Purposefulness* (*The capacity to make life meaningful by creating the means as well as the opportunities for achievement and organising time in line with one's goals)* remained a significant predictor of dropout in the multivariate analyses. The opposite pole of *Purposefulness* indicated lack of goal direction. Individuals with higher maladaptive range of *Purposefulness* were less likely to initiate treatment.

6.2.2.4 Relational capacities domain and facet levels

Finally, the *Relational capacities*, indicating *the capacity to genuinely care about others, be able to communicate personal experiences, and to hear and engage with the experiences of others*, was associated with treatment initiation. The early drop-out group had statistically significant more dysfunctional levels on *Relational* domain than the treatment initiation group in the univariate analyses, but not in the multivariate model.

Based on current knowledge, this is the first study examining the impact of individuals' characteristic adaptation on treatment initiation. The findings highlight the importance of capturing individuals' maladaptive personality functioning early in treatment. In summary, as anticipated, treatment initiation group was associated with more functional levels on *Social Concordance, Relational, Identity and Self-Control* than the early drop out group. However, only *Social Concordance* remained a significant predictor of non-treatment initiation in the full model, since individuals with

dysfunctional levels on this characteristic adaptation dropped out from treatment out early on.

In terms of clinical implications, these findings confirm that characteristic adaptations matter more than the stable individual personality traits in predicting treatment initiation and on providing more complete individuals' clinical description. Regarding personality traits, treatment formulations should consider individual personality differences, especially on extreme low *Conscientiousness* and *Openness* and high *Neuroticism*. As noted above, only few studies have examined the predictive role of personality traits in treatment progress and provide inconclusive findings (Chard & Widiger, 2005; Harkness & McNulty, 2002; MacKenzie, 2002; Miller, 1991; Sanderson & Clarkin, 2002; Stone, 2002; Widiger, 1997). Although the findings on the predictive role of characteristic adaptations on treatment initiation are preliminary, since this is the first study to examine this relationship, they provide a more thorough individualized description than the simple categorical diagnostic classification.

Assessing characteristic adaptations early in treatment provides a roadmap to clinical staff for where to focus their interventions based on an individual's dysfunctional levels that have been found to influence treatment initiation. The results are of direct practical relevance and can contribute considerably to the development and evaluation of detection techniques and provide a valuable clinical toolbox mapping individuals' strengths, weaknesses and potentials, thus assisting case formulation and treatment planning process. Based on these findings, targeted individualized treatment interventions aimed at preventing early drop out could be designed. For example, based on these findings, an individual with highly dysfunctional levels on the facets *Aggression Regulation, Respect or Purposefulness* is at high risk for drop out early on.

Thus, therapists could focus clinical interventions focused on reducing aggressive acting out behaviours, increasing individuals' social skills and empathic understanding towards others, as well as fostering problem solving, self-care and goal achievement skills and simultaneously installing hope that these problems can be treated and that recovery is possible.

From the wealth of scientific literature reviewed here, and the results of the current study, it is evident that individuals with SUD present a heterogeneous group. Despite previous efforts to identify clear-cut factors that could discriminate individuals who are less likely to initiate treatment, previous findings have been inconclusive and inconsistent. A more in-depth analysis of the dynamic interplay of characteristic adaptations with the contextual environment may elucidate how and why individuals with SUD differ in their abilities to cope with, and their responses to, the contextual demands. This line of research has major theoretical and clinical implications. Identifying commonalities in individuals with SUD characteristic adaptations has the potential to generate theoretical assumptions regarding precipitating factors, i.e. causes of the onset of the disorder, or the behavioural response to situational triggers. Based on these theoretical hypotheses, empirical investigations could expand and refine etiological considerations in SUDs but also analyse the dynamic interplay of characteristic adaptations within the treatment environment and identify patterns of behavioural responses. This kind of clinical investigation is the focus of the next research question, examining the role of individuals' personality functioning in critical treatment process variables.

6.2.3 Personality functioning as a predictor of Treatment Engagement

Having examined service users' personality dimensions with treatment initiation during the outpatient preparation phase, the next step of this sequential treatment process evaluation, was to examine the early treatment engagement at the inpatient setting. As explained earlier (see Chapter 3) in this study treatment engagement is conceptualized as multidimensional construct that encompasses behavioural (*Treatment Participation*), cognitive, (*Treatment Satisfaction*) and interpersonal (*Counselling Rapport*) components. These key treatment process indicators have consistently received empirical support as significant predictors of increased tenure and improved post treatment outcomes (Crits-Cristoph & Connolly, 2003; Fiorentine et al., 1997; Hser et al., 2001; Simpson et al., 1997; Simpson, 2004).

Taking into consideration the capacity of the characteristic adaptations to provide a dimensional analytic description of personality functioning, this research question sets out the aim of assessing their predictive role in treatment engagement. This is a central issue of the scientific exploration of this study, given that potential identification of associations between characteristic adaptations and critical process variables, could be used to address the risk of premature termination by acknowledging individual proneness early on and by deploying targeted interventions to enhance engagement. To the current knowledge, this is the first study that examines associations between characteristic adaptations and treatment engagement indicators. Therefore, the aim was not to construct an elaborated theoretical framework of concepts and their associations with personality functioning. Instead, the aim was to perform explorative analyses attempting to elucidate the associations between different dimensions of personality functioning and engagement in treatment.

The most important clinically relevant finding was that the broad and facet level characteristic adaptation emerged as strong predictors at different aspects of treatment engagement. As expected, more functional characteristic adaptation levels and higher motivation were generally associated with more successful service users' treatment engagement.

The literature on clients' psychological functioning and its influence on the formation and maintenance of *Counselling rapport* is marked by major inconsistencies. Several studies found that more severe clients' psychological problems were negatively associated with *Counselling Rapport* (Cournoyer et al., 2007; Hersoug et al., 2001; Lingiardi, Filippucci, & Baiocco, 2005), while other studies did not find such a relationship (e.g. see for review Meier, Barrowclough, and Donmall, 2005; Principe et al., 2006).

For instance, Meier et al. (2005) found that therapists rated alliance as better for clients with more coping strategies, less hostility, greater social support, less psychological problems and more desire for help. In this context, Cournoyer et al. (2007) reported a negative correlation between therapists' alliance ratings and clients' resistance, while a number of authors report that clients with prior dysfunctional social relationships are more likely to have difficulties in establishing and maintaining alliance (Constantino, Castonguay, & Schut, 2002; Hersoug et al., 2001; Horvath, 2001). The findings from this study provide important information about the services user's characteristics that influence *Counselling Rapport* and facilitate the understanding in some of the discrepancies found in the literature. For example, possible explanation of the discrepancies among past results and the current findings are the differences in conceptualizing and assessing severity and psychological problems.

Clients' problem severity is a very broad term that contains very different and heterogeneous concepts of an individual's mental status or condition. Regrettably, the conceptual diversity of the studies and the designs and measures used vary significantly to discern the basis for the inconsistent results. Moreover, many of the reviewed studies utilized sensitive state affect assessment tools to infer more temporal associations. It is important to bear in mind the possible bias in these responses when exploring for associations with critical treatment process variables such as *Counselling Rapport* with sensitive state-affect assessments. Undoubtedly, in clinical practice, state affect assessments are very useful since they provide the possibility to evaluate clients' current emotional state, examine pre-post session mood changes or even record intensity and frequency during short term treatment to assess individuals' progress and change. Therefore, it may be that this rather contradictory result in these critical treatment process variables may be attributed to the state-induced distortion of the individuals' current condition, rather than actual differences of clients' severity levels and *Counselling Rapport*.

Importantly, the other end of the spectrum is also problematic, namely assessing *Counselling Rapport* and individual characteristics with assessments that are not able to capture the dynamic change of individuals' clinical condition. For example, it may be that findings assessing *Counselling Rapport* and individuals' stable characteristics, may reflect more the individual relational predisposed tendencies rather than the actual relationship between the individual and the therapist. These results therefore also need to be interpreted with caution. As critical treatment process variables are dynamic and changeable during the course of treatment, as the same stands for the individuals' condition and clinical symptomatology. It can thus be suggested that a balance is needed

when assessing these treatment process variables between individuals' affective state over-sensitive to change and stable inflexible dispositional characteristics.

The present results are significant in at least two major respects. Firstly, it should be noted that the majority of the above-mentioned studies measured *avoidance behaviour* based on the FFM personality trait Neuroticism. In chapter 3, a detailed explanation was provided of the differences between the stable personality traits, as measured by the Five Factor Model of personality, and of the characteristic adaptations as measured by SIPP.

These adaptive capacities refer to the dynamic organization of personality that concerns the regulation of self and relationships with others, and comprise characteristics including affect and impulse regulation, self and other representations, identity, coping strategies, and acquired skills. Thus, according to this view, the changeability of personality and personality disorder is likely to be more pronounced for (mal)adaptive capacities than for the more stable constitutionally based components (McGlashan et al., 2005; Verheul et al., 2008). As stated earlier (Methodology section), the instrument used in the study (SIPP-118), measures the malleable characteristic adaptations, thus is sensitive to changes in personality functioning.

Secondly, as argued by Paris (2006), treatment interventions do not address or focus on the entire personality structure, but instead focus on specific dimension such as the *Emotional Dysregulation* or *Behavioural Disinhibition*, which are specific facets (Widiger & Mullins-Sweatt, 2009). Effective change occurs with respect to these components rather than the entire, global construct. Thus, accurate description of individuals' dimensional representation of personality functioning based on the characteristic adaptations may facilitate the development of treatment guidelines and

allow for more targeted interventions tailored to individual difficulties. This argument of the clinical applicability of characteristic adaptation is further supported also by the fact that the new DSM-V introduces a new section of a dimensional assessment of personality functioning, discussed in more detail further on. The "acknowledgement of the continuous nature of personality and personality disorder" as stated on the official APA website (APA, 2011) has been considered as one of the key rationales for the proposed dimensional diagnostic system for personality disorder. In particular, granting clinicians the option of generating a personality trait profile for all of their patients and not just those with a personality disorder diagnosis is seen as an important achievement by the DSM-5 drafting committee (APA, 2012; Krueger, Eaton, South, Clark & Simms, 2011).

In regard to the broad domains of characteristic adaptations, findings indicated that *Self-control* and *Relational capacities* were the most significant predictors of *Counselling Rapport* and *Treatment Participation*. *Self-control* is associated with *Negative Emotionality* scale from the SNAP (Clark and Watson, 2008); *Negative Affectivity* (PID-5; Personality Inventory for DSM-5; Krueger, et al., 2011); *Affect Liability* (DAPP; Livesley & Jackson, 2002); *Emotional Stability* (Widiger et al., 1994); and the broad domain *Neuroticism* (FFM; McCrae & Costa, 1990). This fundamental domain of personality was titled *Emotional Instability* by Goldberg (1993) and *Negative Emotionality* by Clark and Watson (2008), and as mentioned in the literature review chapter, it is generally associated with the broad *Internalized spectrum*. Previous studies on diverse clinical population, reported that high levels of *Emotional Dysregulation* related characteristics are associated with non-compliance, denial and behavioural disengagement (Aluja et al., 2007; Gudjonsson & Sigurdsson, 2003; Gudjonsson et al., 2002; Mullins-Sweatt & Widiger, 2007).

Evidence provided in this study is broadly consistent with, and extends previous findings, as higher dysfunctional levels on *Self-Control* or *Relational Capacities* were significant predictors of both poor *Counselling Rapport* and low *Treatment Participation*. This indicates that individuals with low capacity to tolerate and control one's own emotions and impulses are significantly less likely to develop a trusting relationship with their therapists, as well as to behaviourally participate in the treatment process. Likewise, individuals with low capacity to genuinely care about others or feel cared about, be able to communicate personal experiences, and to hear and engage with the experiences of others in the context of a long-term, intimate relationship, are also significantly less likely to participate in treatment and develop rapport with their therapist.

Furthermore, findings indicated that *Social Concordance* and *Relational Capacities* were the strongest predictors of *Treatment Participation*, while *Self-Control* and *Responsibility* domains accounted for an additional amount of the variance in the prediction model for *Treatment Participation*. Interpreting the findings of the impact of characteristic adaptations on treatment engagement, it can be said that characteristic adaptations have a sequential impact on diverse segments of treatment engagement. That is, the interpersonal component of engagement (*Counselling Rapport*) is influenced by the ability for affect tolerance and emotional regulation (*Self-Control*), as well as the capacities for interpersonal communication and relational intimacy (*Relational Capacities*), while the cognitive component of treatment engagement was also influenced by the capacities for interpersonal communication and relational intimacy (*Relational Capacities*). The behavioural component of engagement (*Treatment Participation*) was mainly influenced by the ability for empathy, collaboration and withholding aggressive impulses towards others (*Social concordance*), the capacities for

interpersonal communication and relational intimacy (*Relational Capacities*), the ability for affect tolerance and emotional regulation (*Self-Control*), as well as the capacity for self-direction and goal achievement (*Responsibility*).

The inclusion of the broad domains of characteristic adaptations in the model significantly improved the prediction of treatment engagement by adding 12% of the variance in predicting *Counselling Rapport*, 6% variance in predicting *Treatment Participation* and 5% in *Treatment Satisfaction*, after accounting for demographic, psychological, and motivational variables. However, the assessment at the facet level provides a more comprehensive and analytic description of personality functioning. Distinctive characteristics of specific facet level can be identified and provide a framework for meaningful clinical interpretations. Instead of applying a single label, the complexity of personality functioning may be better captured by the combination of the broad and facet level adaptations. Therefore, additional analyses were conducted to investigate which of the 16 facet levels uniquely contributed to variance in treatment engagement.

6.2.4 Facet level characteristic adaptations as predictors of treatment engagement

The analyses at the facet level revealed some very interesting and compelling findings. For example, while *Identity Integration* and *Social Concordance* were not significant predictors at the broad domain, the examination at the facet level revealed that *Self - Reflective Functioning* from the *Identity* domain and *Aggression Regulation* from the *Social Concordance* domain were strong predictors of *Counselling Rapport.* Likewise, *Emotional Regulation* a facet of *Self-Control* domain, along with *Intimacy* a

facet of *Relational* domain, were the most significant predictors of *Treatment Participation.*

According to the latest revision of the Diagnostic and Statistical Manual (DSM-5), the concept of *Identity* and *Relational functioning* is seen as one of the core markers of personality pathology. Many theories of personality pathology note that both these aspects (self and other representations) are in need of clinical attention (i.e. Clarkin & Huprich, 2011). Problems in self and interpersonal functioning are considered to be indicators of the severity of personality pathology and have been shown to be one of the most important predictors of dysfunction (Hopwood et al., 2011).

Surprisingly, identity and interpersonal functioning have not often been used to assess treatment outcomes (Dineke et al., 2014), neither they have received adequate research attention, considering their importance in the clinical setting. Contemporary diagnosis of the new DSM-V involves the assessment of Personality Functioning Scale (PFS), a hybrid model that simultaneously uses the traditional categorical approach of DSM-IV, along with a dimensional approach. This provides a more comprehensive assessment of pathological personality trait domains and trait facets, as well as a "Level of Personality Functioning-Scale" as an overall measure of the severity of personality dysfunction (Bender, Morey, & Skodol, 2016; Gore, 2013; Schmeck et al., 2013), that specifically delineates and encompasses the more extreme and maladaptive personality variants" (APA, 2012, p. 7).

The characteristic adaptations, as measured by the SIPP-118 assessment utilized in this study, closely align with the maladaptive personality variants of the DSM-5-dimensional assessment. More specifically, *Emotional Dysregulation* of DSM-5 closely aligns with SIPP-118 *Self-control* and the broad domain *Neuroticism* from the FFM;

DSM-5 *Detachment* aligns with the *Identity Integration* and the *Relational Capacities* of SIPP-118, and with *Introversion* the opposite pole of *Extraversion* of FFM; DSM-5 *Antagonism* aligns with SIPP-118 domain of *Social Concordance* and the *Antagonism* from the FFM; while *Disinhibition* of the DSM-5 aligns with SIIP-118 *Responsibility* domain and low *Conscientiousness* on the FFM.

The PFS scale is directly informed by the Psychodynamic Diagnostic Manual (PDM Task Force, 2006), which assumes that an assessment of *Identity* and *Relational Capacities* is of crucial importance for assessing severity of personality pathology (Krueger et al., 2011). Interestingly, it has been suggested that the DSM-5 Level of Personality Functioning Scale was introduced to capture the core impairments in personality pathology that would be able to predict possible alliance problems in therapy and to be indicative of the expected outcome in treatment (Skodol et al., 2011).

This study supports this hypothesis, while the results describe for the first time that higher maladaptive range on *Identity Integration* and specifically the facet *Self-Reflective Functioning* significantly predicted low *Counselling Rapport*. Individuals who had dysfunctional scores on '*the capacity to understand the possible meanings of and causal connections between internal and external experiences, as well as the ability to identify reasons for things happening within oneself rather than constantly trying to find answers in the world outside'* were significantly less likely to develop *Counselling Rapport*.

Mentalization construct has been operationalized as *Reflective functioning* (Fonagy et., 1998) over the last years and it is believed to play an important role in a range of psychopathologies (Fonagy, Bateman & Bateman, 2011). A recent study found statistically significant associations between *Reflective functioning* and the SIPP-118

personality functioning domains *Identity integration* and *Relational capacities*. Also, previous findings indicated that *Reflective functioning* is associated with core aspects of personality pathology and capture clinically relevant phenomena in adult patients with PDs (Antonsen et all., 2016). Recent research examined the role of personality characteristics in *Counselling Rapport* (i.e. Kushner et al., 2016), indicating that clients who are more at ease with closeness and intimate relationships were more likely to establish stronger alliance.

These results support previous research on the *Identity integration* which links *Self-reflective functioning* and *Relational capacities.* Theoretically, *Identity integration* has its routs from the early psychoanalytic concept of personality organization and specifically reflects Kernberg's concept of *Identity diffusion*, and according to Kohut's theory (1971) the failure to develop a cohesive self. The basic assumption was that predisposed aggressive impulsive tendencies and/or early traumatic experiences, hinder the internalized process of self-integration into a whole (integrated positive and negative) and of significant others (Kernberg, 1984).

According to Kernberg, this state of *Identity diffusion* is a core feature determining the cohesiveness of personality organization and leads to severe difficulties in developing a sense of self with attitudes and life goals that are stable and reliable over time (Kernberg & Caligor, 2005). The findings of this study corroborate this theoretical framework, that suggests low *Self-reflective functioning* hinders individuals' intrapersonal and interpersonal capacities. This study provides evidence that service users with low levels of *Self - Reflective Functioning* reported the most difficulties in developing interpersonal relationship with their therapist (*Counselling Rapport).* Dysfunctional levels of *Self - Reflective Functioning* has been also related to insecure

attachment style. A growing body of evidence suggests that clients' attachment affects both therapeutic alliance and treatment outcome. Four meta-analyses have shed light on client attachment, three in association with therapeutic alliance (Bernecker, Levy, & Ellison, 2013; Diener & Monroe, 2011; Mallinckrodt & Jeong, 2014).

In this context, a study by Cournoyer et al. (2007) reported a negative correlation between therapist ratings and clients' resistance, e.g. clients who perceived themselves as being committed to treatment, capable of working in psychotherapeutic context and shared the same goals with their therapist, exhibited more positive attitudes and less resistance and were also viewed by their therapists more positively.

These findings also highlight the important role that resistance may have in hindering therapeutic alliance, as it may represent a fundamental obstacle that interferes with a therapist's efficacy, creates ruptures in alliance, impedes client motivation and undermines the change process (Cowan & Presbury, 2000; Nystul, 2001). Despite the negative impact on treatment process, resistance appears to remain underemphasized (Samstang et al., 2008). Ruptures in the alliance may be conceptualized as a normal condition in the treatment process that partially reflects clients' dysfunctional interpersonal patterns (Safran & Muran, 2003). However, in substance misuse treatment, failure to identify and address them early on may be of great importance, as it may lead to re-enactments, further ruptures of alliance and premature termination. Re-enactments are most likely to occur when the patient has a reduced capacity for self-reflection, another result of being unable to verbalize traumatic experiences that were never encoded when they first occurred, as a result of not having a present witness to their pain.

Hence, it could conceivably be hypothesised that since therapists and clients are in constant interaction in the therapeutic encounter, their interpersonal dynamics appear to be affected by previous clients' relational patterns and may reflect the quality of the therapeutic alliance. It appears that clients' prior maladaptive interpersonal patterns (Sullivan, 1953) and attachment style (Horvath & Symonds, 1991) are transferred into the present relationship with the therapist. Regardless of the theoretical orientation, a number of authors reported that clients with prior dysfunctional social relationships are more likely to have difficulties in establishing and maintaining therapeutic relationships (Constantino, Castonguay, & Schut, 2002; Hersoug et al., 2002; Horvath, 2001) and drop out from treatment (Curtis, 2013).

Supporting previous findings, results in this study indicated that *EnduringRelationship,* a facet of *Relational* domain, was also a significant predictor of *Counselling Rapport*.This confirms the second state of Kernberg's *Identity diffusion*, that early adverse experiences lead to fragmented representations of others and impair the ability to empathize, build up and rely on stable relationships. Lack of intimacy, extreme shame, guilt, repression of memories, abandonment depression, self-reject, victimization, splitting and acting out, are some of the reported responses of individuals who had adverse childhood experiences.

Therefore, this study provides additional evidence of the role of clients' prior dysfunctional social relationships as obstacles for establishing and maintaining *Counselling Rapport*. It may be that is not only the individuals with the prior dysfunctional social relationships who have difficulties in developing *Counselling Rapport*, but a reciprocal difficulty from the counsellors' part too. Treatment providers should ensure that counsellors are adequately trained and can provide professional care,

especially when unresolved childhood adverse experiences are involved. Early detection, identification, and proper treatment tailored to the individual needs could alleviate the collateral harms caused by these prior dysfunctional social relationships and counsellors could provide new ways of relational interaction that are based on trust, respect and empathic understanding.

Finally, literature indicates that service users' psychosocial or interpersonal style, such as clients' hostility, coldness, non-assertiveness and social avoidance have been found to predict poor alliance (Connolly Gibbons et al., 2003; Gurtman, 1996; Muran et al., 1994; Paivio & Bahr, 1998; Schauenburg et al., 2000). In support of this, service users with high dysfunctional levels on *Aggression regulation* and *Hostility* were significantly less likely to develop *Counselling Rapport* in this study. The relation of clients' hostile interpersonal behaviour with the quality of *Counselling Rapport* implies the important role that characteristic adaptations may have in the formation of *Counselling Rapport* and subsequently in the treatment process.

Thus, the findings extend our knowledge that dysfunctional levels on *Identity integration* and especially on the *Self-Reflective Functioning* facet, *Aggression regulation* of facet of *Social concordance* and *Enduring Relationship*, a facet of *Relational* domain, significantly impair the development of *Counselling Rapport.* However, what the clinical implications are of this and how these dysfunctional levels inform case conceptualizations, remains unknown. Clearly, more studies are needed in the general psychotherapeutic field to evaluate the clinical implications of maladaptive levels on *Identity* and *Relational capacities.*

A possible interpretation, based on interpersonal psychodynamic scenario, is that clients with *Enduring Relationship* will bring the same maladaptive relational patterns

into their relationship with the therapist. Particularly in the course of treating difficult clients, therapists are likely to experience strong countertransference feelings. Service users bring into therapy their already dysfunctional models of interpersonal relationships as well as problematic cognitive patterns (Safran & Muran, 2003). Based on these dysfunctional schemas and expectations, service users may adopt the same problematic ways and misperceptions that they had in the past, transferring them in the new relationship with the therapist. Through this re-exposure, clients' conflicts and interpersonal patterns that they could not handle in the past, come into surface in the "here and now" relationship.

Adopting an interpersonal flexibility to combine firm limits and compassion, the therapists create secure boundaries and use process comment to give interpersonal feedback about their relationship in the here and now. Instead of responding to a patient's challenges and neurotic behaviour, the therapist adopts a noncritical interpretation of the behaviour and suggests alternative interaction style. If therapist acts upon the countertransference reactions, it may lead to (re-enactments) re-exposure of the old maladaptive relational patterns which may further result in ruptures in the alliance and therapy termination. Instead, therapists motivate clients to engage in treatment in more meaningful ways and facilitates *Counselling Rapport* by inviting the client in a more genuine and authentic relationship. Therapists provide, in this way, a corrective emotional experience, showing when it is possible to tolerate clients' acting out and disapproval, setting firm limits and avoiding manipulation (Teyber, 2003).

Process comments bring the therapeutic relationship to life. By using process comments, the therapist invites the client to explore collaboratively any possible difficulties that the client may have to enter in therapy. When the client is invited to

focus on the here and now in therapeutic interaction, the therapist has the opportunity, through the progression of the process comments, to reveal unspoken conflicts, significant misunderstandings or expectations that client may have, and that may interfere in the therapeutic relationship (Yalom, 2005). This highly individualized process demands from the therapist self-awareness, active engagement, flexibility and perspicacity, in order to respond to the specific needs and unique experiences of the client.

Finally, individuals with higher maladaptive range of *Relational Capacities* and specifically on the *Intimacy* facet, had significantly less possibilities to *participate in treatment* process. Individuals with high adaptive levels of *Identity Integration* had also increased capacities to relate to others**.** This has a theoretical support, as according to Erikson (Erikson, 1959), identity diffusion is the absence of the capacity for self-definition, reflected in emotional breakdown at times of physical intimacy. It has been supported that identity disintegration can be characterized by the incapacity to develop intimate relationships, as intimacy requires levels of self-definition, otherwise there is the fear of fusion and loss of identity (Schmeck et al., 2013). Likewise, it has been supported that identity disintegration and sense of self influence, the capacity for effective interpersonal functioning and lack of interpersonal relationships is defined by deficits in empathy and intimacy (Berghuis, Kamphuis & Verheul, 2013).

Social concordance, conceptualized as the ability to value someone's identity, withhold aggressive impulses and work together with others (Verheul, 2008),is associated with elements of low *Agreeableness*; low (FFM); *Dissocial Behaviour* (DAPP-BQ;); *Antagonism* (PID-5; Krueger, et al., 2011) and the opposite pole of *Cooperativeness* of the Temperament and Character Inventory; (Cloninger et al., 1993).

Maladaptive range on this domain is primarily related to relationship dissatisfaction, conflict, and criminality (Ozer & Benet-Martinez, 2006). Individuals at this level are expected to be among the most difficult patients to treat and they will be disagreeable, competitive, oppositional, distrustful, suspicious, manipulative, and/or arrogant (Widiger & Presnall, 2013).

Not surprisingly, dysfunctional level of *Social concordance* was the most significant predictor from the broad domains of *Treatment Participation*. In this study, *Aggression Regulation,* as a facet of *Social concordance,* was also a significant predictor of low *Treatment Participation*. Individuals with higher maladaptive range on *Aggression Regulation* had difficulties in participating in the treatment process. Responsibility domain conceptualized as *the capacity to set realistic goals and to achieve these goals in line with the expectations generated in others* (Verheul 2008), is associated with Disinhibition scale (PID-5; Krueger, et al., 2011); and low *Conscientiousness* in the Five Factor theory of personality (otherwise known as constraint; John et al., 2008). This domain concerns the control and regulation of behaviour, and contrasts being disciplined, compulsive, dutiful, conscientious, deliberate, workaholic, and achievement-oriented, with being irresponsible, carefree, impulsive, loose, disinhibited, negligent, and hedonistic (Roberts, Jackson, Fayard, Edmonds, & Meints, 2009). Not surprisingly, *Responsibility* domains was a significant predictor of *Treatment Participation* at the broad level, while *Trustworthiness*, a facet of *Responsibility* defined as *internalized values and norms of social collaboration and capacity to behave in accordance to these*, also significantly predicted *Treatment Participation*.

6.2.5 Personality functioning as a predictor of Treatment Completion

The final step of this sequential treatment process evaluation was to examine the role of characteristic adaptations in treatment completion. It was hypothesized that more dysfunctional characteristic adaptations will be negative prognostic indicators for treatment completion.

6.2.5.1 Treatment engagement as predictor of treatment completion

As mentioned in the literature review, studies have provided evidence that early engagement is directly linked with therapeutic progress and predicts better retention (i.e. Best et al., 2010; Hubbard, Simpson & Woody, 2009). Specifically, a strong relationship between high *Counselling Rapport* and *Treatment Participation* with favourable treatment outcome has been reported in the literature.

The findings from this study support prior research on the important role of treatment engagement in treatment completion. Adopting a multivariate conceptualization of Treatment engagement, defined as clients' overall behavioural, interpersonal, and cognitive commitment towards achieving treatment benefits, current findings indicated that treatment engagement was one of the most significant predictors of treatment completion. More specifically, *Counselling Rapport* and *Treatment Participation* account for most of the variance explained of the prediction model. One unanticipated finding was that *Client satisfaction,* although significant in the univariate analyses, did not remain significant predictor of treatment completion in the multivariate analysis.

This finding is contrary to previous studies which have suggested that clients' satisfaction with treatment was one of the key factors of engagement and strongly

predicts longer retention and better treatment outcomes (Best et al., 2006; Carlson & Gabriel, 2001; Gordon et al., 2008; Hser et al., 2004; Villafranca et al., 2006). A potential explanation of this is that dysfunctional characteristic adaptation included in the full model, may have decrease the prediction power of *Treatment Satisfaction* on treatment completion. This was confirmed when the model was tested without the inclusion of the characteristic adaptations, and *Treatment Satisfaction* remained a significant predictor of treatment completion.

In order to examine this in more detail, future studies should adopt more sophisticated statistical models, which could run separately structural equation models for each engagement indicator and treatment completion. Alternatively, mediation models could also be used to assess the prediction of *Treatment Satisfaction* on treatment completion and characteristic adaptations as mediators of this prediction.

6.2.5.2 Evidence of personality functioning as predictor of treatment completion

This study contributes to the scientific literature and provides additional evidence on the association of treatment engagement with improved service users' personality functioning and treatment completion. More specifically, highly engaged service users had significantly more functional characteristic adaptations. Confirming previous research evidence and having established the association between treatment engagement and treatment completion, the next step was to examine which characteristic adaptations contribute to, or affect, final treatment completion. There are important controversies raised in the literature regarding the influence of specific client level factors on treatment completion. Several studies report that the presence of

additional diagnosis decreases retention (Green, Polen, Dickinson, Lynch, & Bennett, 2002; Kokkevi, Stefanis, Anastasopoulou, & Kostogianni, 1998). On the contrary, other studies found no such relationship (Miller, Ninonuevo, Hoffmann, & Astrachan, 1999) or even the opposite findings (Siqueland et al., 1998). Meier and Barrowclough (2008) in their systematic review identified 58 previous studies that examined the relationship between mental health problems and retention in drug treatment. Although the findings indicated there wee no significant differences in retention among clients with dual diagnosis and those without, contradictory results were reported in regards to psychological dysfunction and treatment retention.

While a number of studies found no important relationship between clients' psychological symptoms and retention (Epstein, et al. 1994; McCaul et al. 2001; Ross et al. 1997; Ryan et al. 1995; Saxon et al. 1996;Sayre et al. 2002; ; Tidey et al. 1998;;; Wallace & Weeks 2004), other studies identified sufficient evidence that high level of clients' problem severity is related to treatment drop-out (Carroll et al., 1993; Haller et al. 2002; Haller & Miles 2004; Kissin et al. 2004; Lang & Belenko 2000; Petry & Bickel 1999; ; Van Stelle & Moberg 2004). Research indicates that personality pathology is common among SUD patients, which means that knowledge of the PD treatment field might be a valuable contribution to SUD treatment. In these studies, a large portion of SUD patients meet criteria for an axis II-diagnosis, (Karterud, Wilberg, & Urnes, 2010; Skodol, Oldham, & Gallaher, 1999; Verheul & van den Brink, 2005). Also, for the above-mentioned studies, it has been supported that although the distribution of psychiatric diagnoses was comparable between completers and non-completers, clients with personality disorder were disproportionally found in the dropout group. It remains unclear whether these individuals have the same chances to equally participate, form alliance and adapt to the treatment environment in the same manner.

This is of concern, because studies on psychiatric samples with comorbid substance misuse demonstrate that dual diagnosis is strongly associated with poor compliance and non-engagement (Brown et al., 2011; see for reviews Kreyenbuhl et al., 2009; O'Brien, Fahmy, & Singh, 2009).

Likewise, the above mentioned review by Meier and Barrowclough (2008), indicated that the strongest evidence for the negative effect of psychiatric comorbidity on retention has been found for clients with personality disorders and specifically for antisocial personality. Likewise, externalizing personality dimensions have been associated with increased likelihood of dropout (Best et al., 2009; Loeffler-Stastka, 2011). Impulsivity related traits (see for review Poling, Kosten & Sofuoglu, 2007) and *Sensation/Novelty Seeking* (e.g. Kravitz et al., 1999) predicted drop out from treatment.

Additionally, studies on individuals with SUD, using different assessments consistently demonstrated that high levels of *Hostility* and antisocial related traits were significant predictors of drop out (Joe et al., 1999; Lang & Belenko, 2000; Meier & Barrowclough, 2009; Simpson et al., 1995). This study supports previous findings and provides additional evidence of how these individual characteristic adaptations are related to drop out. In this study, high levels of *Hostility* and *Aggression Regulation* were significant predictors of drop out from treatment. Also, *Social concordance* domain indicating 'the ability to value someone's identity, withhold aggressive impulses towards others and work together with others', that is associated with low FFM *Agreeableness, Dissocial Behaviour* (DAPP-BQ;); *Antagonism* (PID-5; Krueger, et al., 2011), remained a significant predictor of drop out. It has been supported that individuals who have dysfunctional levels on this domain are expected to be among the most difficult patients to treat and they will be disagreeable, competitive, antagonistic,

oppositional, distrustful, suspicious, manipulative, and arrogant (Widiger & Presnall, 2013).

This study provided additional insight into the role of maladaptive range of *Social concordance* in treatment, since in the previous analyses it was the strongest predictor of low *Counselling Rapport*, indicating problems in developing a relationship with the counsellor, as well as low *Treatment Participation*. This may also explain some of the contradictory findings presented in the literature regarding client problem severity, since an individual with dysfunctional levels on Social concordance may be easily included in both groups, with those with additional psychological severity and those without. So, it might be that the studies reported client problem severity as significant predictor of drop out, could have involved a sample with dysfunctional characteristic adaptations on *Social concordance*, who may also have had state affect problems, i.e. anxiety, depression etc.

Furthermore, *Self-control* that is associated with *Negative affectivity* and the internalized spectrum, was also a significant predictor of drop out. As with *Social concordance*, *Self-control* in the previous analytic step examining treatment process had a major role in individuals' treatment engagement. The capacity to tolerate, use and control one's own emotions and impulses was a significant predictor of both *Treatment Participation* and *Counselling Rapport*. Individuals with dysfunctional levels on *Self-control* had difficulties in developing therapeutic relationship with their counsellor and they were not participating in the treatment process. Therefore, it could be argued that dysfunctional levels on *Self-control* and/or on *Social concordance*, negatively affect treatment engagement, which consequently influences whether the individual will complete or drop out from treatment.

Taking into account the high rates of dual diagnosis in substance misuse treatment, the current shift in research evolved towards the recognition that a number of personality traits commonly observed in drug users do not necessarily reflect pathological states. As stated previously (section 2.2.1), maladaptive personality traits often cause over-diagnosis of Axis II personality disorders due to the overlapping symptomatology, exacerbation of symptoms, behavioural expression and extremity of certain traits that mimic personality disorder pathology. Although this study supports the association and high prevalence of personality dysfunction with SUD, it also extends knowledge by providing strong evidence of the importance of disentangling personality disorders and traits from dimensional personality functioning, as measured by the characteristic adaptations.

Without disentangling traits from characteristic adaptations and distinguishing the level of severity and intensity of the client presenting problems, PD and SUD studies will remain fragmented, presenting contradictory findings and unable to capture individual differences and change during treatment. This interpretation has been supported by Arnevik, (2009), where he argued that a major limitation in PD literature is the weakness of the previous studies to detect change in personality functioning. Previous studies examining treatment effectiveness of PD treatment have mainly used symptom measures for estimating change, such as the symptom check list (SCL-90), Beck depression scale, measures of interpersonal problems, and different forms of other measures correlating high with current symptom distress.

This may have led to two important limitations in the PD literature. Firstly, it may explain the significantly increased odds of axis I disorders in patients with axis II disorders, as it has been reported (Grant et al., 2004), and secondly, the inability to

capture potential change of PD functioning due to treatment. In the alternative criteria for PDs in the Diagnostic and Statistical Manual of Mental Disorders, 5th ed. (DSM-5), it is proposed that PDs are characterized by significant impairments in self- (identity and self-direction) and interpersonal (empathy and intimacy) functioning (American Psychiatric Association, 2013).

Understanding the mechanisms of change in personality functioning, and formulating treatment guidelines based on this dimensional conceptualization, requires us to first develop detailed insight into the dynamic interplay of different characteristic adaptations with the treatment environment and identify patterns of behavioural responses. The idea of phenotypic expressions of traits (manifested behaviours), for example that effortful control may be trained and that this might have a lasting impact on the brain, offers exciting possibilities for the development of interventions to modify traits such as conscientiousness (Posner & Rothbart, 2007).

Mapping individual maladaptive relational capacities, identity disturbance and inner regulatory processes such as *Self-Control* or *Behavioural Disinhibition* may decode major individual vulnerabilities of responding to the contextual demands. This study is the first of its'kind, as it examined the role of personality functioning based on these dimensional characteristic adaptations in treatment initiation, engagement and treatment completion. This provides an advantageous framework over previous studies and helps to explain some of the major inconsistencies found in the literature on the role of personality functioning and the substance misuse treatment.

Moreover, being aware of individuals' (dys)functional characteristic adaptations, helps therapists to be alert of the potential (re-enactments) and strong countertransference reactions that client may try to elicit. In this way,the therapist

through process comments of the interpersonal interaction, provides a corrective emotional experience to the client. That is, clients instead of re-experiencing the old maladaptive relational patterns work collaboratively with the therapist and develop more functional characteristic adaptations. This will not only facilitate the treatment process but will constitute the basis of change of personality functioning, transferring these new adaptive relational patterns with significant other outside treatment.

Finally, the SUD treatment should be better equipped and informed by the dimensional personality functioning research and clinical practice. De Fruyt and De Clercq (2014) argued that such dimensional models may form a viable alternative to describe latent tendencies underlying fluctuating symptoms, avoiding using DSM-5 labels referring to multiple categorical diagnoses

In this study, psychological functioning in terms of mood disorders (*Depression* and *Anxiety*) and psychosocial functioning were not significant predictors of treatment completion. Likewise, *Social concordance* that is associated with affect regulation, aggression, asocial, pro-social functioning and overall with the externalizing spectrum, was the main predictor of drop out. These findings are interesting and compelling since they extend knowledge and shed light on some of the contradictory evidence on the role of clients' problem severity and drop out. Another possible explanation of the contradictory findings related to clients' problem severity and treatment completion, is that studies used different terminologies, measurements and operationalization of what constitutes client problem severity. These important inconsistencies regarding client severity and retention have been a subject of other studies as well (Deck et al., 2005; Millar et al., 2004;). Previous research by Woody, McLellan, and Luborsky (1984) has shown that regardless to the received treatment interventions, clients' pre-treatment

psychiatric severity was related to treatment outcome. More specifically, clients with more severe psychiatric symptoms exhibited less improvement when assigned to drug counselling alone, while clients significantly improved when combination of psychotherapeutic approaches and drug counselling was utilized. Recent findings demonstrate that patients with moderate severity had positive treatment outcomes in both high and low intensity programmes, while those with higher severity exhibited better outcomes in high intensity programmes (Chen, Barnett, Sempel, & Timko, 2006).

Moreover, high comorbidity clients matched to higher intensity services exhibited better psychiatric and substance use outcome than those treated in low intensity services (Chen et al., 2006). The frequency and intensity of treatment intervention is a major factor that could have altered the results of this study as well. It could be hypothesized that individuals' characteristic adaptations profile determine the levels of adjustment in the treatment environment, and this varies according to the level of dysfunction of certain adaptations, as well as the different type of treatment. In other words, individuals with diverse dysfunctional characteristic adaptations may respond differently to different treatment settings in terms of intensity, frequency and treatment approach.

6.2.6 Other predictors of treatment initiation, engagement and treatment completion

Strong empirical evidence shows that motivation plays a crucial role in the early stages of therapy, as it is positively associated with treatment retention, formation of therapeutic alliance and *Treatment Participation* and *Satisfaction* (Brocato & Wagner, 2008; Donmall et al., 2009; Gregoire & Burke, 2004; Meier et al, 2005; Principe et al.,

2006). Likewise, lack of motivation for treatment or readiness to change is one of the most cited reasons for lack of engagement, failure to comply and drop-out across settings (Cahill et al., 2003; Connors et al., 2000; DeLeon et al., 2000; Fauziah & Kumar, 2009). The findings of this study bring additional evidence on the key role of motivation in the early phases of treatment, since *Treatment readiness* and *Desire for help* were among the strongest predictors of treatment initiation, treatment engagement and treatment completion. Individuals that were more ready to receive treatment and desired to be in treatment were significantly more likely to initiate and complete the preparation phase, participate in treatment, develop *Counselling Rapport* and complete treatment. In future research, it would be important to examine to potential mediating or moderating effects of dysfunctional characteristic adaptations between treatment motivation and treatment initiation and treatment completion. Regretfully, this study didn't explore these mediating or moderating effects. To develop a full picture of the role of personality functioning in treatment initiation, additional studies will be needed to build more parsimonious models adopting Structural Equation Modelling (SEM) or Latent Class Analysis (LCA) to explore potential paths or sub-groups of individuals with combination of characteristic adaptations.

Results are contrary to previous studies which have suggested that several client variables are related to early drop-out from drug misuse treatment. In terms of socioeconomic and drug-related client variables, early drop-out has been associated with clients' current unemployment, lower education level, history of arrests, longer drug use histories, cocaine abuse, and previous treatment experiences (Brower, Blow, Hill, & Mudd,1994; Claus, Kindleberger, & Dugan, 2002; Gainey, Wells, Hawkins, & Catalano, 1993; McKayetal., 1998; Stark,1992; ;). The comparison of those who initiated

treatment with those who dropped out early, contrasts previous findings as none of the demographic variables were significantly different.

Previous findings also reported a negative association of age and drop out (Green et al., 2002; McKellar et al., 2006; Maglione et al., 2000a; Maglione et al., 2000b; Mertens & Weisner, 2000; Roffman et al., 1993; Satre et al., 2004; Siqueland et al., 2002; Wickizer et al., 1994). In contrast to earlier findings, however, no evidence of association between age and drop out was detected. Various explanations have been given for this difference. Stark (1992) suggested that younger service users have higher levels of impulsivity and lack self-discipline, that may affect their decision to leave early from treatment. McKellar et al. (2006) proposed that younger service users have less negative consequences of drug use due to their shorter history of drug misuse and this affects their treatment need levels.

In support of this proposal, in this study the mean age (M=33.60) was younger than the mean age of other samples which is usually above 35. Research provides mixed findings on gender and drop out, with some studies showing woman are more likely to drop-out (Bell, Cramer-Benjamin & Anastas, 1997; Monras & Gual, 2000; Nelson-Zlupko, Kauffman, Dore, 1995), while other studies showed that men have poorer retention rates (Arfken et al., 2001; Agosti et al., 1991; Weisner, Mertens & Moore, 2001). A literature review, by Greenfield et al., reported no clear gender difference in treatment retention, although different predictors have been associated with drop-out in each group. Likewise, this study showed no sex differences between the two groups. Although women were underrepresented in this study, research on SUD demonstrates that women underrepresentation is a common phenomenon. The evidence on the association of clients' psychiatric severity and retention is inconclusive, with

some studies reporting that higher psychiatric severity was positively associated with retention in substance misuse treatment (i.e. Castel et al., 2006; Siqueland et al., 2002), while others reported negative association (i.e. Green et al., 2002). Also, other studies reported that the relationship of higher levels of psychiatric distress and drop out was influenced by client's gender (i.g. Haller et al., 2002; Mertens & Weisner, 2000).

Findings from the review by Meier and Barrowclough, (2009), suggest that there are no significant differences in retention rates among clients with co-morbid problems and those without, with the exception of those with antisocial personality that were more likely to drop out. Several explanations have been given for the relationship between treatment retention and psychiatric comorbidity. It may be that intense distress may act as a motivator to stay in treatment in order to reduce the discomfort. In contrast when service users have less severe symptomatology, the perceived need for treatment may be reduced (Castel et al., 2006; Curran et al., 2002). Finally, the relation of psychiatric distress and psychological problems with treatment retention may be influenced by the actual symptoms (e.g., unstable mood swings, aggression, lack of intimacy and capacity for empathy, low self-control and frustration tolerance) that influence the therapeutic process and consequently influence the chances to remain in treatment (Broome et al., 1999; Haller et al., 2002).

In regards to service users' pre-treatment characteristics, *Treatment Readiness* was the most notable and consistent predictor among the background measures for engagement indicators in every model. Being the most significant predictor, *Treatment Readiness* confirmed previous studies that indicate its crucial role for the formation of *Counselling Rapport* and *Treatment Participation* (Brocato & Wagner, 2008; Donmall et al., 2009; Gregoire & Burke, 2004; Meier et al, 2005; Principe et al., 2006).

Psychological wellbeing variables were not significant predictors of treatment engagement in this study. Literature on clients' psychological functioning and its influence on the formation and maintenance of alliance or behavioural participation is marked by major inconsistencies. Several studies found that more severe clients' psychological problems were negatively associated with alliance (Cournoyer et al., 2007; Hersoug et al., 2001; Lingiardi, Filippucci, & Baiocco, 2005), while other studies did not find such a relationship (e.g. Principe et al., 2006).

These findings contradict, or possibly extend, the conclusions of existing treatment engagement literature indicating that service users' pre-characteristics such as marital status (McLellan, 1983), employment status (Joe & Simpson, 1975; McLellan, 1983), and drug treatment history (Gainey et al., 1993; Joe & Simpson, 1975) are associated with treatment engagement. Although some of these pre-characteristics were associated with treatment engagement in the univariate analyses in this study, they were not significant predictors in multivariate analyses.

Regarding psychosocial wellbeing, evidence from past research is also mixed. Depression has been positively linked to treatment retention (e.g. Joe et al., 1999; Justus et al., 2006), negatively (e.g. Broome et al., 1999; Kohn, Mertens, &Weisner, 2002), or unrelated (e.g. Booth et al., 1991; Curran et al., 2002). Anxiety has also been associated with treatment dropout (i.e. Broome et al., 1999). In this study, early drop-out group compared to treatment initiation group had higher levels of *Anxiety* and *Depression*, but only the latter reached significant levels in the multivariate model. Individuals with higher levels of *Depression* were less likely to initiate treatment in this study. Although no formal psychiatric or diagnostic evaluation was conducted, neither such variables were included in the analyses; dysfunctional *Social concordance* was significant

predictor of premature drop out. As explained previously, *Social concordance* is associated with hostility, aggression and dissocial behaviour. Thus, results support the above-mentioned review by Meier and Barrowclough, (2009), that demonstrated that individuals with antisocial personality features were less likely to remain in treatment.

6.2.6.1 Personality, programme level factors and treatment process and outcome

Individual motivation and engagement are likely to depend not only on individual experiences, but also on how well programme staff and resources can respond to their specific needs. The consistency of individual indicators of engagement within programmes as well as their between-programme variations deserve closer study. Unfortunately, in this study no comparative analysis was possible to examine the effects of the different treatment programmes on individuals' engagement levels or on the personality functioning as analyses would have been underpowered. This represents a limitation of the study since it cannot therefore identify potential confounding effects of the treatment type.

It is plausible that the relationship of personality functioning and engagement is moderated by contextual factors such as the different programme needs and organizational climate or staff attributes. Consistent with this, Beutler, Clarkin, and Bongar (2000) report that clients with varying levels of externalizing (impulsivity, projection, sociopathic behavior) and internalizing (inhibition, obsessiveness, restraint) characteristics responded differently to diverse treatment approaches. Here, although the recruited TC is a modified version in order to respond to a broader population than the highly structured traditional TCs, it still follows basic TC rules and therapeutic procedures.

More specifically, individual counselling and one to one therapy with the counsellor are not as central and there is less focus on the therapeutic alliance, which may suit or not suit clients depending on their dysfunctional characteristic adaptations. Similarly, individuals with certain dysfunctional characteristic adaptations might be able to adjust more successfully to certain treatment settings. For example, an individual with aggressive acting out behaviour, and low tolerance and affect regulation may feel uneasy in the highly structured and hierarchical TC environment, whilst an individual with dysfunctional levels on effortful control may benefit from the participatory social learning environment of TC and develop behavioural skills in an environment that promotes prosocial behaviour and collective work.

Thus, as there are fundamental differences in the treatment process between the treatment settings included in the current study that could not be fully explored, this issue should be taken into consideration in future treatment process evaluations.

6.2.7 Changes of characteristic adaptations during treatment

An interesting finding in this study is that individuals with substance use disorder during the course of treatment can reach more mature and functional characteristic adaptations. For example, in *Identity Integration* 42 (58.3%) out of 70 moved towards improvement out of which the 33(45.8%) pass the normative mean. The domain *Identity Integration* is interpreted as the ability to see oneself and one's own life as stable, integrated, and purposive. The facets included in this domain are *Stable self-image* (the ability to experience an inner sense of continuity/sameness of self across time and situations), *Self- reflexive functioning* (the capacity to understand the possible meanings of and causal connections between internal and external experiences, as well

as the ability to identify reasons for things happening within yourself rather than constantly trying to find answers in the world outside), *Self-Respect* (the capacity to feel that you are worthy, and to know that others or yourself have no right to harm you physically or emotionally), *Purposefulness* (the capacity to make life meaningful by creating the means as well as the opportunities for achievement and organizing time in line with one's goals), and *Enjoyment* (the capacity to enjoy without feeling guilty).

According to Feenstra, Hutsebaut, Verheul, and van Limbeek (2014), these changes in *Identity Integration* constitute a resilience component and symptom reduction. Ability for self- reflection and maintenance of a unique sense of self and stable self- image might facilitate individuals' adaptation in the contextual environment and prevent relapsing behaviour. Further research is required in order to examine these hypotheses.

Overall, comparing the two groups, the pattern of change was clear. On all broad domains, except one (*Social Concordance*), the magnitude of baseline- during process follow up differences was smaller in dropouts, or in some cases had no change or even an opposite direction, compared to treatment completers. The significantly larger effect-sizes for degree of baseline – during the process follow up change along with the significant p- values for completers, suggest that the pattern of change is valid, and not a consequence of different group sizes. Even though groups were small, several differences were found when comparing the treatment responses between groups. In agreement with expectations, it was found that there was a significant clinical improvement of characteristic adaptations of treatment completers group in contrast to the drop out group.

Findings indicated that treatment engagement is associated with significant improvement of the severity levels and that completing treatment is significantly associated with reliable changes of personality functioning towards the normative mean, and clinically significant change. This study also informs the gap in the literature about the stability and change of personality functioning among SUD patients, as well as the changes in levels of severity due to treatment. This confirms previous assumptions that the SIPP-118 can be used as a measure of change due to treatment, indicating which capacities have improved and became more adaptive (Verheul et al., 2008). This has major clinical implications as it shows that psychosocial treatment can produce significant changes towards more adaptive personality functioning, but also provides evidence that substance misuse treatment should target more on personality dysfunction and developing personalized interventions that are tailored to these individuals' differences. This may address the high drop- out rates phenomenon in SUD treatment.

Following this sequential scientific exploration, the results of this research question come as a confirmation of the previous steps (maladaptive characteristic adaptations negatively affect *Therapeutic Alliance* and *Treatment Participation* which in turn influence *Treatment Retention*) and builds on the treatment process framework by filling the gaps that were unexplored. This is of major clinical significance, since it provides a node-link mapping of early warning signs of individuals' maladaptive areas that require clinical attention and may create an incremental approach to personalized clinical strategies. In addition, in some cases drop out was associated with clinical deterioration, unfortunately the study design did not allow examining whether this is due to drop out or vice versa. Further research is necessary to examine this relationship following treatment.

Important patterns also emerged when change from baseline to follow-up was explored. Not surprisingly, the greatest treatment response was shown by service users who completed treatment. In particular, completers expressed a significantly higher degree of positive change in their identity integration levels, intimacy and the ability to relate to others. The fact that those who completed treatment also made relatively greater changes in their way of relating to themselves and others suggests that it is important for service users with low levels of *Identity Integration* and *Relational Capacities* to complete treatment. This may act as a protective factor, improving chances of positive long-term outcome, psychosocial adaptation and reduction of the risk of relapse following treatment.

6.2.8 Clinical applicability of dimensional based characteristic adaptations for disentangling personality functioning from personality disorders

Many terms are used to describe the population of individuals who have the experience of some form of mental illness along with substance use disorder. The term co-occurring disorders is increasingly being used to describe the phenomena of having multiple clinical syndromes simultaneously. The term co-occurring or comorbid disorders implies two disorders with a purely temporal relationship, and not necessarily a common underlying cause or related aetiologies (Morisano, Babor, & Robaina, 2014). Comorbidity appears to be one of the most challenging issues affecting the course and treatment as it is often associated with lack of treatment engagement, poor retention, impulsive, risky behaviours, frequent crisis, exploiting others, non-compliance with treatment, and greater risk for relapse.

Literature indicates that dual diagnosis is the rule rather than the exception in substance misuse treatment. Co-occurrence of SUD-PD is associated with greater functional impairment (Skodol et al., 1999) and a mutual deterioration of the prognosis (Karterud et al., 2010; Trull et al., 2000). This is cause for concern, considering the poor prognosis and the lack of empirical support for efficacious interventions targeting individuals with dual diagnosis (Cornelius et al., 2005). As a result, co-occurring disorders and their clinical management represent a key complicating factor in substance misuse treatment. The complicated symptomatology and individuals' multiple treatment needs causes them to be excluded from many substance misuse treatment programmes as they represent a greater challenge for practitioners.

However, high prevalence, overlapping symptomatology and lack of clarity and clear distinction between personality traits and disorders induces important implications in treatment and brings into question its usefulness in treatment planning process. It has been supported that term "comorbidity" or Co-occurring Disorder (COD) includes a multiplicity of diagnostic categories that covers all types of mental health disorders, without distinguishing the levels of severity and intensity of those disorders. This also displays the problematic nature of drawing conclusions involving the various diagnoses possible when referencing the diverse clinical problems with blanket terminology including COD (Flynn, & Brown, 2008). Such a pessimistic view might turn into a self-fulfilling prophecy where neither clinicians nor patients believe in change, and thus no change will happen (Verheul, 2006). In this line, research evolved towards the recognition that normal and pathological personality is distributed dimensionally and suggest progressive methods of dimensional assessment for measuring personality functioning (Arnevik, Wilberg, Monsen, Andrea, & Karterud, 2009; Widiger & Simonsen, 2005).

Acknowledging individuals' vulnerability on a trait level, it appears that dysfunction results from their phenotypic expression in the social environment. Individuals' tendency in selecting, shaping and forming social environments is not just a by-product of their basic pre-dispositions, but rather a result from the constant interaction with the contextual environment and their self-efficacy to develop effective adaptive capacities. Identity integration and development of symbiotic interpersonal relationships are adaptive responses that an individual must develop in order to be functionally integrated in the psychosocial process. Maladjustments in this process influence personality functioning. Beyond the constitutional vulnerability, resilience and malleability of the characteristic adaptations, contextual environment and socialization agents are the naturally regulatory mechanisms that impede or facilitate the psychosocial adaptations. Thus, environment and socialization agents may play a determining role in facilitating the process of constructive sublimation of basic tendencies through functional characteristic adaptations.

Given that individuals who misuse substances often develop maladaptive interpersonal patterns and dysfunctional characteristic adaptations, treatment interventions could facilitate the development of more adaptive ways of responding and coping to the contextual treatment demands. An important focus of attention in the proposed revisions of the DSM-5 is the distinction between general personality (dys)functioning and specific personality traits (Berghuis, Kamphuis & Verheul, 2012). Thus, conceptual distinction between basic tendencies and adaptive capacities may have particular clinical significance in treatment of substance misuse. This might be especially important for understanding the role of personality in treatment, formulating individualized treatment planning and developing personality matched interventions.

In line with this, contemporary personality models distinguish traits from personality (mal)functioning or characteristic adaptations. The terms adaptive capacities or characteristic adaptations are used interchangeable to describe the level of (mal)adaptive personality functioning, mainly referring to affect and impulse regulation, representation of self and others, identity integration, capacity for intimate relationships and effective social functioning and copping strategies. Adaptive capacities usually refer to the dynamic organisation of personality that concerns the regulation of self and relationships with others, and comprise characteristics like affect- and impulse regulation, self- and other representations, identity, coping strategies, and acquired skills.

Thus, a dimensional measure of core personality pathology might be applicable both to clinical work with patients as well as in research on treatment change. As emphasised by Livesley (Livesley & Jang, 2005), adaptive capacities are essential for individual's ability to fulfil major life tasks. Even if some of the adaptive capacities of personality to some degree may be influenced by biological constitution (McCrae et al., 2000), the conceptual distinction between basic tendencies and adaptive capacities may have heuristic value for the development of a further understanding of the core pathology of SUDs and PDs. This might be especially important in the understanding of maturation and change in SUD, and change due to therapeutic interventions.

A recent study conducted by Lien (2015) examined the personality problem severity among Norwegian adult SUD patients using the questionnaire Severity Indices of Personality Problems (SIPP-118). Comparative analyses between PD sample (Arnevik et al., 2009) and the study sample consisted by SUD, indicated that SUD patients have personality problems at a level of severity comparable to previously

investigated PD patient samples, and significantly more severe than personality problems found in normal population samples (N=478) (Andrea et al., 2007). Findings from that study highlighted that personality problems is a common feature among SUD patients, and the necessity for separately assessing dimensional personality functioning in SUD patients (Lien, 2015).

Although not pertinent for the aims of this study, a simple descriptive comparative analysis indicated that there is an overlapping facet profile and scores between the Norwegian PD sample (see Figure 5, page 114) and the Greek SUD sample. In contrast, the Greek SUD characteristic adaptations facet level profile was different from the scores of the Dutch normal population sample on the majority of the 16 SIPP-118 facets. Thus, findings indicated that individuals with SUD have personality problems at a level of severity comparable to PD patients and significantly different from the normal population. The fact that the dysfunctional levels of characteristic adaptations of this sample is closer to the PD dysfunctional levels support previous research that reports high prevalence of personality pathology and substance misuse or vice versa (Grant et al., 2004; Skodol et al., 1999) and confirms theoretical conceptualizations that links substance misuse with personality functioning.

However, although this study supports the association and high prevalence of personality functioning with SUD, it also extends knowledge by providing strong evidence of the importance of disentangling personality disorders and traits from dimensional personality functioning as measured by the characteristic adaptations. Taking into account the high rates of dual diagnosis in substance misuse treatment, current shift in research evolved towards the recognition that a number of personality traits commonly observed in drug users do not necessarily reflect pathological states. As

stated previous (section 2.2.1), maladaptive personality traits often cause over-diagnosis of Axis II personality disorders due to the overlapping symptomatology, exacerbation of symptoms, behavioural expression and extremity of certain traits that mimic personality disorder pathology.

Finally, the SUD treatment should be better equipped and informed by the dimensional personality functioning research and clinical practice. De Fruyt and De Clercq (2014) argued that such dimensional models may form a viable alternative to describe latent tendencies underlying fluctuating symptoms, avoiding using DSM-5 labels referring to multiple categorical diagnoses. Study findings strengthen the assumption that personality problems are a common feature among SUD patients. This is of major concern due to the poor prognosis and the lack of empirical interventions targeting those with co-occurring disorders.

Previous research findings indicated that SUDs personality dysfunctional levels are comparable with personality disorder sample and have significantly higher dysfunctional characteristic adaptation levels than the normal population sample (Lien, 2015). In support of this, the mean scores of the characteristic adaptations of this sample were closer to the mean scores of personality disorder sample, and significantly more dysfunctional than the non-clinical population sample (see Figure 5, page 116). But the study also provides compelling evidence regarding the clinical significant change of the dysfunctional characteristic levels of the individuals that were engaged and completed treatment. These robust findings are opening a new direction for both the personality problems of SUDs treatment, as well as the importance of disentangling personality disorders from dimensional characteristic adaptations. This study provides additional insight on the clinical research of what we know so far regarding personality changes,

the poor prognosis, prevalence rates and the role of the critical treatment process variables on altering those maladaptive capacities that mimic personality disorder pathology.

This has important clinical and theoretical implications. Firstly, it provides the basis for disentangling personality dysfunction from full blown personality disorders, addressing in this way the over diagnosis phenomenon of comorbidity on SUD studies. Secondly, acknowledging individuals' personality dysfunction based on their characteristic adaptation early on in treatment may be a significant preventive measure to avoid premature drop out by targeting therapeutic interventions to the specific dysfunctional characteristic adaptations rather than applying general intervention targeting the whole personality structure. Thirdly, implementing treatment decisions and interventions based on the individuals' adaptive and maladaptive capacities sets a more tangible and realistic intervention plan.

In line with previous observations of the malleability of characteristic adaptations to change, the findings from the baseline and during process assessment revealed that service users mean scores and dysfunctional levels change during treatment. At the baseline assessment, service users' mean scores were closer to personality disorders, while at the later stage, during process assessment, a clinical significant change was observed whereby service users' mean scores changed towards more functional levels and closer to the normative mean.

These findings may also provide some explanatory guidance for the aetiological factors of substance misuse, explain the association of personality pathology and SUD and highlight the clinical applicability of the dimensional based conceptualizations for treatment planning and guiding clinical interventions. To our knowledge, this is the first

study that examines associations between characteristic adaptations and treatment completion. The findings of this study clearly indicate that treatment completers had significantly greater gains than those who dropped out in improving their personality dysfunctional levels towards the non-clinical population. More specifically, the findings may shed light on the 'grey zone' between the easily interpretable behavioural observation of the drop out group characteristics, i.e. problems accepting treatment plan, difficulty following the rules or resisting therapeutic interventions and leaving treatment.

Dropping out from treatment may entail more complex intrapersonal (e.g., identity integration), interpersonal (e.g., intimacy), as well as disturbed prosocial behavioural (e.g., aggression regulation) and regulatory behavioural (e.g., effortful control) components that could affect diverse segments of the therapeutic encounter. In support of this hypothesis, the study findings indicated that drop out group had significantly more dysfunctional adaptation levels that negatively influenced their engagement levels and subsequently their treatment completion. These findings are encouraging, since they do not confirm the hypothesis that personality dispositions alone set the individual in a predetermined negative prognostic outcome. They do however, provide useful data for mapping service users profile based on their personality functioning that could guide clinical interventions and identify potential extreme scores that require attention during the early (treatment initiation) and mid-treatment (treatment engagement). In this process, phenotypic expression of individuals' adaptive capacities may vary according to their predisposed tendencies and contextual triggers. That is, variation of behavioural responses may result from characteristic adaptations and flexibility of the contextual environment to absorb those who exhibit difficulties in adapting to treatment norms.

Therefore, the identification of personality dimensions that may activate dysfunctional behavioural patterns during treatment is of major importance. This would enhance treatment providers' ability to facilitate individuals' adaptation and allow greater flexibility to respond to the diversified clients' needs. Likewise, the underlying assumption of personality-matching interventions (Conrod et al., 2010; Woick et al., 2009) is that individuals with different clusters of personality traits exhibit different treatment responses. Thus, if more defined moderating variables of engagement could be identified, the risk of treatment termination could be addressed by acknowledging individual proneness early on.

This study confirms and builds upon several clinical papers based on anecdotal experiences addressing the potential ability of personality dimensions to predict treatment and assist in treatment decisions (Chard & Widiger, 2005; Harkness & McNulty, 2002; MacKenzie, 2002; Miller, 1991; Sanderson & Clarkin, 2002; Stone, 2002; Widiger & Trull, 1997). Facet level adaptations representing intrapersonal (e.g., identity integration), interpersonal characteristics (e.g., intimacy), adaptations indicating disturbed prosocial behaviour (e.g., aggression regulation), as well as control or regulating behaviour (e.g., responsibility; effortful control) appeared to predict distinct segments of treatment engagement. This may provide a node-link mapping of individuals' maladaptive areas that require clinical attention and guide treatment interventions.

The evidence presented thus far clearly supports the need to develop treatment responses that correspond to dysfunctional characteristic adaptations and facilitate individuals' engagement vulnerabilities. This kind of dimensional based framework is in line and further supports the current developments of the DSM-V, which provides an

alternative hybrid model for the simultaneous use of diagnoses "Level of Personality Functioning-Scale", a dimensional tool to define the severity of the disorder. This new type of dimensional classification system provides both to clinicians and researchers an opportunity to describe the patient in much more detail than previously possible (Schmeck et al., 2013).

As mentioned previously in Chapter 2, clinical utility is one of the most important aspects of the diagnostic classification systems (DSM-5, ICD-10). However, studies indicate that in clinical practice diagnostic manuals are not that helpful for treatment planning and designing interventions. The development of ICD and DSM diagnostic manuals has been guided mainly by construct validity rather than clinical utility (Mullins-Sweatt et al., 2016). According to First (2010), one of the most important goals of the psychiatric classification is to facilitate clinicians' work in designing effective interventions that are targeted to patients' condition.

As argued by Mullins-Sweatt and colleagues (2016: 143) '*Diagnostic revisions that would assist in this process might include changes to the definition of a disorder to allow a clinician to identify patients who are most or least likely to respond to a particular treatment, providing severity specifiers directly related to treatment selection or dimensions related to treatment-relevant comorbidities and unspecified categories, providing dimensional measures to monitor improvement, and revising the diagnostic structural groupings (e.g., providing a single diagnostic class based on treatment response to a particular treatment strategy)*'

These recommendations provide the basis for a shift in clinical and research attention from the construct validity that was the main focus, towards the clinical utility and treatment specificity. In other words, from 'one-fit all' approach to individualized

interventions tailored to specifiers and dimensional indicators directly related to treatment relevant comorbidities and the individual's adaptive capacities; that is, designing treatment planning and selecting interventions based on the individual's treatment responses.

6.2.9 Exploring mechanisms of change between personality functioning and critical treatment process variables and future directions

Despite previous efforts to identify clear-cut factors of the specific mechanisms of change during treatment, findings have been inconclusive and inconsistent. A more in-depth analysis of the dynamic interplay of characteristic adaptations with the contextual environment such as programme characteristics and/or staff attributes, organizational climate and treatment needs, would help to identify how and why individuals with SUD differ in their abilities to cope with, and their responses to, the contextual demands. This line of research would facilitate the understanding of both the programme level effects on the process of change as well as the behavioural responses to the situational triggers or treatment interventions. This has major theoretical and clinical implications. Identifying commonalities in individuals with SUD characteristic adaptations has the potential to generate practice based interventions as well as advance the quality of service provision tailored to individualized needs. Delineating the effect of programme level factors on personality functioning, may provide the basis for enhancing treatment specificity through individualized interventions that are practice based and empirically-validated.

One of the aims of this research was to examine the degree of change towards more functional levels between treatment completers and drop outs on the basis of baseline and during process follow-up. This would indicate whether remaining in treatment and completing it provides any therapeutic value in regards to change in personality functioning compared to leaving treatment prematurely. The findings indicated that during treatment, dysfunctional characteristic adaptations change towards more functional, and close to the normative, means levels and this is more likely for those who complete treatment. Thus, this study shown that one straightforward mechanism of change is remaining in the treatment environment. The findings indicated that service users who completed treatment improved their dysfunctional levels more than service users who drop from treatment.

This study provided evidence for the first time in regards to the reciprocal relationship between personality functioning and treatment engagement as it clearly indicated that more functional characteristic adaptations were associated with higher levels of treatment engagement and vice versa. Thus, individuals who were engaged and completed treatment improved their characteristic adaptations and reached more functional levels towards the normative mean. However, the findings are preliminary and further research with larger samples is needed to allow further insight and interpretations. Below are some key points and future directions for exploring of the potential mechanisms of change between personality and critical treatment process variables.

1) Dimensional assessment of personality functioning. The conceptual framework based on dimensional diagnostic indicators of personality functioning adopted in this study contributed to the identification of individual attrition

vulnerabilities as well as to the prediction of counselling rapport and treatment participation. The study set out to discover whether the disentanglement of maladaptive traits from diagnostic categories and the clinical significance of characteristic adaptations would assist in the identification of potential obstacles to treatment engagement and might provide the basis for individualized personality matched interventions. Future efforts could adopt a similar dimensional conceptual framework as in this study and in line with the DSM-5 hybrid dimensional approach.

2) Focus on malleable characteristic adaptations. Acknowledging individuals' vulnerability on a trait level, it appears that dysfunction results from their phenotypic expression in the social environment. Thus, individuals' tendency in shaping and forming social environments may not depend only on basic dispositions but rather on the ability to develop effective adaptive capacities. Therefore, the conceptual distinction between basic tendencies and adaptive capacities has particular clinical significance and might be especially important for studies exploring the role of personality in treatment and formulating individualized treatment planning.

3) Flexible dimensional measures to capture the dynamic change and monitor improvement. As stated above, one of the major weaknesses in personality research in the clinical setting is the overall lack of ability of the studies to capture changes during treatment. These adaptive capacities refer to the dynamic organization of personality that concerns the regulation of the self and relationships with others, and comprise characteristics including affect and impulse regulation, self and other representations, identity, coping strategies, and acquired skills. Thus, according to this view, the changeability of personality and personality disorder is likely to be more pronounced for (mal)adaptive capacities than for the more stable constitutionally based

components (McGlashan et al., 2005; Verheul et al., 2008). Studies could use instruments such as the SIPP-118, which measures malleable characteristic adaptations, and is sensitive to changes in personality functioning.

4) Broad and facet level analysis. The analyses at the facet level revealed compelling findings that were not revealed in the analysis of the broad domains, and which might go some way to explain previously inconsistent results in the literature. For example, while *Identity integration* and *Social concordance* were not significant predictors when considering the broad domain, the examination at the facet level revealed that *Self-reflective functioning* from the *Identity domain* and *Aggression regulation* from the *Social concordance domain* were both strong predictors of Counselling Rapport.

5) Organizational and programme level effects - therapeutic involvement requires a certain degree of adaptation in the social context. In this process, phenotypic expression of individuals' adaptive capacities may vary according to their predisposed tendencies and contextual triggers. Thus, any variation of the behavioural responses may result from the individuals' characteristic adaptations and the flexibility of the contextual environment to absorb those who exhibit difficulties in adapting to treatment norms. Therefore, the identification of the effects of the treatment type and setting on triggering diverse behavioural patterns during treatment is of vital importance.

6) Different time intervals. Each phase and timeframe in treatment involves different processes of change, challenges and interventions. The change process is not linear, with a start and finish, and may not be unidirectional, but rather a dynamic ongoing process with circular effects. In this study personality functioning was assessed during the early stages of treatment (baseline assessment) and was reassessed during

mid-treatment (during process follow-up at the inpatient setting). This provided the opportunity to assess potential change of personality functioning as well as examine changes in personality functioning in association with other treatment process indicators. i.e. engagement levels, drop out, and completion. However, studies with large samples are now needed which should adopt designs that provide the capacity to anticipate and assess such non-linear change processes through frequent measurement.

7) Building conceptual models. The development of concept maps of the potential causal links and feedback loops between personality functioning and the treatment process, informed by the literature and service provider and services user involvement, could provide a conceptual framework for detailed hypotheses testing in future studies.

6.3 Strengths

The current study was limited in its scope due to the constraints of a PhD project, it has a number of strengths that are highlighted below. This study employed a longitudinal multi-site individual follow-up design to explore the relationship between service users' characteristic adaptations and their treatment engagement in a number of treatment sites with different treatment philosophies. The advantage of this method over retrospective designs is that the relationship between the independent variables such as service users' characteristic adaptations levels and the outcomes treatment initiation, treatment engagement and treatment completion were examined prospectively.

Also, the assessments took place at two stages, baseline and during-process follow up, thus making the data collected more robust without potential bias such as reliance on participants' recall accuracy. Additionally, this study design allowed the

investigation of potential changes, i.e. clinical improvement or deterioration of individual's condition, from the early treatment – baseline assessment to the mid treatment – during process follow up. This allowed for examination of the malleability of characteristic adaptations, as well as inference of associations of dysfunctional characteristic adaptations with critical treatment process variables.

Previous studies in the field have often ignored the potential clinical changes during treatment, and assessed participants only once during treatment. Another advantage of the study is the combination of the assessment tools utilized, as well as the inclusion of both broad and facet level traits and characteristic adaptations in the multivariate analysis. Previous studies in the field have often analysed only specific broad domains of personality without taking into consideration the lower order traits and their significant overlap, resulting in numerous inconsistencies, as explained in the section 2.2.4 of the literature review chapter. It has been supported that the analysis at the facet level provides more accurate and detailed description of individual clinical condition, as well as disentangles the overall among the facet level characteristic adaptations. Clinical research on personality pathology and treatment outcome has been driven mainly by predisposed traits as stable individual characteristics. This has certain drawbacks, since the ability of measures used to capture potential changes in personality has been questioned by numerous prominent authors (e.g. Verheul, 2008; Livesley, 2007; Krueger & Eaton, 2010).

Failure to capture (mal)adaptive personality functioning, as well as the changes occur during the therapeutic process, represents a major obstacle in the clinical research field and hinders the effective monitoring of service users' progress during the treatment process. The inclusion of service users' characteristic adaptations is a strength of the

present study, as to date these have not been considered in SUD treatment studies. This is of importance, as there is evidence that individuals' current condition during the early phases of substance misuse treatment, could alter or mask their personality functioning and symptomatology. Thus, assessment of individuals' characteristic adaptations and re-assessment later on in treatment, validate the current study findings and provide a viable solution for capturing accurately and reliably individuals' personality functioning in SUD treatment.

The thorough examination of the existing literature and identification of the various potential confounders concerning the outcome variables of this study, decreased the risk of the 'logical fallacy when correlation between two factors is prematurely taken as evidence of a cause-and-effect relationship, while ignoring possible confounding effects by other known and unknown factors. Where the evidence was limited in the field of SUD treatment, the general treatment literature was also reviewed. Hence, a wide range of possible confounders was entered in the multivariate analyses.

Another strength is that this study is the first that explored service users' personality functioning by using multiple measures to assess the association with critical treatment process variables. Only a handful of clinical studies have examined both personality traits and characteristic adaptations and none in the context of during substance misuse treatment process. While some studies have focused only on a small range of personality traits or characteristics with treatment outcome or relapse, the current study assessed various segments of treatment engagement including *Counselling Rapport, Treatment Participation, Treatment* and *Satisfaction*, to explore the impact of personality in treatment in more depth. Finally, the multi-site design involving different treatment programmes across Greece makes the sample representative and the results

should be generalizable to other areas. The findings suggest that this approach would also be beneficial in other sectors beyond SUD treatment.

6.4 Limitations

Several limitations of this study should be noted. These limitations may have influenced the results and need to be taken into account when considering reliability and generalisability of the findings. The sample was drawn from an inpatient substance misuse treatment which limits the ability to generalize findings across treatment settings and types of treatment. Various protocol implementation difficulties interfered with the data collection process. The timing of new client notification, space constraints, and inconsistent client attendance at the treatment facilities affected the assessment team's ability to evaluate each new client entering the treatment programme. Service users who dropped out of treatment after only few treatment sessions posed significant challenge to the assessment team as they may not have been available for testing during the time of administration. To address this, in cooperation with the treatment staff the researcher carefully consideredthe logistics of carrying out the investigation, anticipated potential problems, and worked out alternative reasonable solutions. As a result, it was possible to keep the number of individuals who dropped out before initial assessment at very low levels. Despite that, the study sample may have contained an overrepresentation of treatment completers. One strategy to deal with the premature drop outs was to change the protocol according to the treatment setting in order to minimize the risks of not obtaining at least the first administration battery.

This study adopted a dichotomy classification system in both phases for treatment progress, i.e., those who initiated treatment versus those who dropped out at the preparation phase, and treatment completers versus drop out group for the inpatient

phase. This dichotomy was likely too narrow categorization to adequately encapsulate treatment status. An alternative classification scheme could consist of: treatment completion (i.e. service user completed treatment based upon initial or revised treatment plan), dropout (i.e. service user leaves treatment against treatment advice), therapeutic discharge (i.e. treatment is discontinued for reasons such as nonadherence with programme rules), and other (i.e. medical or psychiatric hospitalization) (Mammo & Weinbaum, 1993). Furthermore, it has been suggested that these different drop out subgroups have fundamental differences that should be examined to understand drop out patterns (Rabinowitz & Sergio, 1998). However, as one of the primary aims of this study was to assess personality functioning for both treatment completers and the drop out group, complete profiles of personality functioning, as well as motivational and engagement levels were obtained for drop out group as well.

The decision to use a cross-sectional naturalistic rather than an experimental study design was taken in order to examine the hypothesised relationships in naturalistic treatment settings. The benefit is increased external validity but at the same time, this approach reduces internal validity. That is, a number of factors could not be controlled in the present study, which might have influenced service users' decision to drop out from treatment, as well as their treatment engagement levels.

Factors such as differences in treatment units (e.g. staff, service training, organizational climate), personal circumstances of service users or conflicts with practitioners could not be assessed and thus need to be seen as potential confounders. Additionally, the generalisability of these results is subject to certain limitations including the naturalistic setting, relational design and the fact that clients' pre-treatment variables involve numerous dimensions that are beyond the methodological

sophistication of this study. Moreover, it is suggested that behavioural measures may be more beneficial for capturing personality predispositions than self-reports. However, as the focus of the study is to trace the phenotypic expression of personality traits in relation to engagement indicators, rather than the underlying basic tendencies, it was decided to use self-report measures as they provide resourceful dataset of individuals' own perception regarding their behavioural tendencies (Krueger et al., 2007).

Another important factor that may have influenced the current findings was the unprecedented economic recession in Greece. While current trends for treatment demand demonstrated a sharp increase during the financial downturn, mental health and substance misuse treatment services were being cut back as part of government is radical austerity programmes. This could affect the institutional capacity to correspond to the current demands and presented a fertile ground for expansion of multiple public health related problems. The severe budget cuts and the downgrading socioeconomic conditions, influenced treatment providers ability to respond effectively as they had to respond to massive income of new service users with more severe conditions, while at the same time facing recourse cuts. Likewise, the absence of a positive outlook after treatment and insufficient reintegration strategies may hinder the mobilization of drug users to engage in recovery as well as increase the likelihood of relapse.

Finally, as with the vast majority of the existing research in substance misuse treatment, this study employed quantitative methods to answer the research questions of interest. Quantitative approach has been dominant in substance misuse research. However, there is a growing trend of research projects based on qualitative methods in order to gain deeper understanding of substance misuse and its treatment (Rhodes, 2000). Qualitative research is increasingly used to answer questions related to alcohol

and drug policy (e.g. Stinson et al., 2004), treatment evaluation and understanding of patterns of substance use in various subgroups (e.g. Lalander, 2003). Within the substance use disorder field, "qualitative techniques have played an important role in complementing quantitative research by helping to interpret, illuminate, illustrate, and qualify empirically-determined statistical relationships" (Neale, Allen, & Coombes, 2005, p. 1591).

Researchers have advised that qualitative methods should be employed both independently and in conjunction with quantitative investigations to elucidate factors that facilitate and hinder treatment entry; treatment engagement; lapses and relapses to substance use during and following treatment; planned and unplanned treatment termination; and treatment readmission. In this line, the combination of qualitative and quantitative methods would provide further clarification of statistical data by offering an in-depth understanding of underlying meanings and experiences. The role of the qualitative method in this study would distinguish how the partially context-sensitive characteristic adaptations and clients' subjective interpretation of treatment experience are related or influence each other. Thus, the qualitative approach would facilitate to capture more adequately the nature and complexity of the quantitative associations found in this study. This could uncover more in-depth understanding of the emerging patterns of the relationship between personality and engagement.

6.5 Recommendations for future research

In order to keep the clinical field updated as a whole, and substance abuse treatment field in particular, future research needs to move beyond focusing solely on the service users and examine interactions between personality functioning and treatment engagement with organizational climate, client attributes and programme characteristics. Thus, future studies should also examine characteristic adaptations and treatment responses of different treatment programmes in terms of intensity, frequency and out/inpatient setting, as this could provide additional insight on how different contextual treatment environments facilitate or impede individuals' adaptive capacities.

As an example, a useful supplement to the current study would be a study with a longitudinal multi-site design including different treatment settings (outpatient, inpatient) in order to measure SUDs personality functioning and target those characteristic adaptations that are more dysfunctional or resistant to change, such as *Social concordance* and conduct pre-during and follow up assessment For example, an individual with high dysfunctional levels on *Social Concordance* could adapt more in an environment that is less structural and hierarchical, with less confrontation and pressure i.e. outpatient setting, self-help groups and personal centre approach. In contrast, an individual with dysfunctional levels on *Identity Integration* and *Relational Capacities* could gain more in a therapeutic environment that promotes awareness, insight and interpersonal learning such as interpersonal process oriented group and contemporary psychodynamic treatment, i.e. Dialectic Behavioral Therapy, Schema Therapy etc.

This would also inform us about the stability and change of personality problems among SUD patients, and would develop a new paradigm in the psychotherapeutic context, by developing interventions based on the levels of severity, intensity and malleability of characteristic adaptation. Thus, clinical researches would be able to indicate whether, and which, treatment facilitates service users to pass from the dysfunctional characteristic adaptations towards healthier levels closer to the normative mean. This has both theoretical and clinical implications. Theoretically, it would confirm the malleability of characteristic adaptations in contrast to personality traits that are stable and inflexible. In this way, clinical researchers could disentangle characteristic adaptations from predisposed tendencies and focus on the potential clinical improvements that could be achieved if therapeutic interventions could be tailored according to these individual differences. Form the clinical perspective, clinicians could target their therapeutic interventions on certain individuals' dysfunctional characteristic adaptations that represent obstacles for treatment engagement or for remaining in treatment.

Such a study could also build on the theoretical implication of the current findings and shed light on the aetiology of the co-occurrence between SUDs and PDs. In light of the ongoing effort to align DSM criteria for personality disorders with evidence based research, future research should continue to investigate the links between characteristic adaptations and SUD treatment process variables. This area of investigation aligns with the newly introduced dimensional criteria in Section III of the DSM 5 (APA, 2013).

With regard to personality functioning, this study's findings support the notion that more dysfunctional levels predispose individuals to negative prognostic outcome.

Further studies are needed to take a closer look at the contributing factors of this outcome, e.g. the degree of overlap of general personality traits from the Five-Factor Model of personality and characteristic adaptations. This area of personality functioning research seem particularly promising as the latest versions of the DSM and ICD classification already are moving towards this direction. The model of personality disorder diagnosis, as proposed by the DSM-5 Task Force on Personality and Personality Functioning, allows for a more differentiated approach to clinical diagnosis that takes into account dimensional impairments of personality functioning and adaptive versus maladaptive trait expressions. The current findings support this approach and concur with the proposed diagnostic model of the Section III of the DSM-5.

Moreover, understanding the relationship between personality functioning and clinical symptomatology has important implications for elucidating aetiology and comorbidity, as well as identifying at risk individuals and tailoring treatment. For example, characteristic adaptation that are associated with the emotional experience and expression may regulate the relationship between genetic neurobiological dispositions and clinical symptoms. Identifying the pathways between personality and disorder can help to elucidate more proximal processes involved. As this was beyond the current scope of this study, no such multilevel modelling was applied, therefore this argument is limited to the subjective interpretation of the findings. Future studies could use structural equation modelling to test such transactional effects.

Furthermore, objective measurement based on empirical taxonomy and isolation of certain variables may indicate the influential role of personality in treatment engagement and facilitate the systematic accumulation of findings. Approach strategies discussed above could fit more into a deductive research phase. However, characteristic

adaptations and clients' narratives, that express personality traits, are all context-sensitive. Future studies could adopt qualitative methodology and explore how the partially context-sensitive characteristic adaptations and client subjective interpretation of treatment experience are related or influence each other. A qualitative study could also build on the current findings, as there is a further need to adequately capture the nature and complexity of the quantitative associations found in this study. This may uncover more in-depth understanding of the emerging patterns of the relationship between personality and engagement.

An inductive approach will provide the possibility to comprehend a variety of meanings that individuals attribute to their treatment experience and delineate a broader context in which personality dimensions may expose engagement vulnerabilities. That is, quantification of engagement indicators from this study, left some unanswered questions about why individual scores are different in particular segments. Also, statistical evidence indicated some unexpected correlations between of certain characteristic adaptation and engagement indicators. Future qualitative studies based on an in-depth analysis of individuals' self-narratives and perceived contextual reality, may "reveal the story" behind this relationship

6.6 Conclusions

The present study addressed the lack of personality research in SUD treatment process involving service users from different treatment types and settings. Previous studies in such settings focused on the influence of client characteristics or treatment interventions on treatment engagement and clinical outcomes. Also, whilst there is substantial attention on the association between substance misuse and personality functioning, there has been very little research regarding the influence of personality functioning on treatment process. The current study addressed this deficit and contributed to the evidence base by integrating different personality assessment tools to examine the role of personality functioning within the 'black box of treatment'.

This study, informed by the recent developments of the hybrid model of the DSM-V that assesses dimensionally personality functioning, examine at consecutive steps of the treatment journey the effects of service users' personality functioning on treatment initiation at the early stages of treatment, treatment engagement mid-period in treatment and treatment completion, the final stage. This provides a more comprehensive assessment of pathological personality trait domains and trait facets as well as a "Level of Personality Functioning-Scale" as an overall measure of the severity of personality dysfunction (Bender, Morey, & Skodol, 2016; Schmeck et all., 2013). This innovative diagnostic model has a unique clinical applicability since it provides a detailed description of individuals' personality profile including personality traits and characteristic adaptations. Thus, disentangling traits from disorders based on a continuum of their intensity and severity indicates the clinical utility of dimensional approach, as it may improve individualized assessments, enhance treatment specificity and facilitate appropriate personality matching interventions.

Overall, the present study's findings lend support to the notion that characteristic adaptation help to understand the association between personality functioning with the treatment process variables. The study adds new knowledge to the field of clinical research by showing that certain dysfunctional characteristic adaptations impact diverse segments of treatment engagement and consequently treatment completion. Clearly, higher levels of dysfunctional characteristic adaptations are related to poorer engagement in treatment, including interpersonal component (*Counselling Rapport*), behavioural (*Treatment Participation*) and cognitive component (*Treatment Satisfaction*). Therefore, characteristic adaptations account for additional explained variance in treatment engagement over and above psychological and motivational components. Elevated levels of some adaptations appeared to be more significant predictors in diverse segments of treatment engagement.

Furthermore, the findings clearly indicated the malleability of characteristic adaptations and that remaining in treatment is related with therapeutic gains. In contrast with the drop out group, treatment completers had higher level of change towards more functional characteristic adaptations levels closer to the normative mean and clinical significant improvement. This is an important finding as it provides a hopeful message for the clinicians to develop realistic expectations of the degree of service users' potential change. Taken together, the results of this study highlight the importance of the conceptual distinction between basic tendencies and characteristic adaptations and their role within the treatment process. In clinical practice, this would imply that despite personality traits stability, treatment interventions could moderate the degree of dysfunctional behavioural phenotypes by targeting the partially context-sensitive characteristic adaptations. This could contribute to the identification of individual

attrition vulnerabilities so that they could be adequately addressed early on in order to prevent premature termination and enhance clients' engagement.

The clinical implications of these findings are both compelling and encouraging. The fact that treatment engagement is associated with the malleable characteristic adaptations suggests the potential for clinical and treatment improvement. In regards to clinical improvement therapeutic involvement requires a certain degree of adaptation in the social context. In this process, individuals' adaptations may vary according to their predisposed tendencies, phenotypic expression of adaptive capacities and contextual triggers. That is, variation of behavioural responses may result from characteristic adaptations and the flexibility of the contextual environment to assimilate those who exhibit difficulties in adapting to treatment norms. This would enhance treatment providers' ability to facilitate individuals' adaptation and allow greater flexibility to respond to the diversified clients' needs.

The dimensional approach to personality, represented by the SIPP-118, seems a promising tool to apply in treatment of substance misuse. Given its advantages of disentangling traits from disorders, mapping characteristic adaptations and an individual's strengths and weaknesses, this approach can provide clinicians with valuable information on personality functioning and subsequently facilitate the development of clinical formulations and personalized-oriented interventions. Utilizing treatment decisions and interventions based on the individual's adaptive and maladaptive capacities sets a more tangible and realistic intervention plan. Such knowledge can inform the design of programmatic interventions to enhance engagement, which can potentially improve retention and treatment outcomes. Empirically speaking, this study adds to the existing literature describing characteristic

adaptations of service users who participate in intensive substance abuse treatment programmes and provides additional evidence related to whether or not the diverse dimensional subtypes of individuals have different chances of initiating, engaging and completing treatment programme. Furthermore, study findings clarify the extent to which service users' dysfunctional characteristic adaptation levels are malleable to clinical change towards the normative more adaptive levels during the course of treatment.

Following this sequential scientific exploration, the results of this study come as a confirmation of the previous steps (maladaptive characteristic adaptations negatively affect therapeutic alliance and *Treatment Participation* which in turn influence treatment retention) and builds on the treatment process framework by filling the gaps that were unexplored. This is of major clinical relevance, since it provides a node-link mapping of early warning signs of individuals' maladaptive areas that require clinical attention and may create an incremental approach to personalized clinical strategies. In addition, in some cases drop out was associated with clinical deterioration; unfortunately, the study design did not allow to examine whether this is due to drop out or vice versa. As a result, further research is necessary to examine this relationship following treatment.

Important patterns also emerged when change from baseline to follow-up was explored. Not surprisingly, the greatest treatment response was shown by service users who completed treatment. In particular, completers expressed a significantly higher degree of positive change in *Identity Integration* levels, intimacy and the ability to relate to others. The fact that those who completed treatment also made relatively greater changes in their way of relating to themselves and others suggests that it is important for service users with low levels of *Identity Integration* and *Relational Capacities* to

complete treatment. This may act as a protective factor, improving chances of positive long-term outcome, psychosocial adaptation and reducing the risk of relapse following treatment.

A less hopeful finding from this study highlights the resistance to change in *Social Concordance* in more than half of the participants involved in the study. This is cause of concern, since evidence from this study indicated that *Social Concordance* influences individual treatment experience from the very beginning. *Social Concordance* was a predictor of early treatment drop out, influenced treatment engagement and also predicted treatment completion. It could be attributed to the treatment interventions and the effectiveness of the particular treatment programmes which participated in the study. It could also be that changes in *Social Concordance* are more resistant to alteration and need more time to occur. Several interesting questions remain. One of the most relevant is whether treatment interventions could be developed targeting changes in *Social Concordance* and, if applicable, what would this imply in terms of personality functioning and quality of life, whether it would increase individuals' prognosis in treatment outcome, enabling them to function more adaptively in and out of treatment. How these changes would be maintained following treatment?

The general manner in which treatment interventions are matched to service users' needs could be anchored in the dimensional based framework detected by this study: For example, dysfunctional levels on *Social Concordance,* and especially on *Aggression Regulation, Purposefulness, Cooperation* and *Respect,* are a red flag for lack of treatment initiation and early drop out at the early stages of treatment. Likewise, in the case of individuals with dysfunctional levels on *Self-Control* and *Relational Capacities,* and particularly on the facet levels *Self - reflective functioning, Aggression*

regulation and *Enduring relationships*, treatment providers could expect potential problems in building *Counselling Rapport*. Thus, providers could anticipate that these individuals would require further clinical attention on this issue and employ strategically targeted interventions to foster therapeutic relationship, making sure that individuals' needs have been met. Likewise, in the case of an individual with dysfunctional levels of *Social concordance, Self-Control* and *Relational Capacities*, and particularly on the facet levels of *Emotional regulation, Intimacy, Trustworthiness* and *Respect*, treatment providers could expect potential problems with individuals' behavioural participation in treatment, and thus take appropriate measures to foster behavioural participation (i.e. cognitive behavioural techniques, homework etc.).

The current findings stress the importance of improving and streamlining addiction assessments and practice in line with the recent developments of the DSM-V. Assessment procedures could be improved by using an additional dimensional based screening. The one provided in this study is a good practice-based example in this respect and provided support for using a two-staged assessment procedure in routine clinical practice at the baseline and during process. This would enhance treatment providers' abilities to have a more thorough description of the severity and personality functioning of their clients, as well as changes made during treatment or issues that require further attention.

This study comes to add to the existing clinical evaluation studies and highlights the importance of the systematic evaluation and monitoring as the forefront of the social policy development and formulation of evidence based practices. The conceptual framework developed from this study, integrating contemporary psycho-diagnostic dimensional assessment tools and critical treatment process variables, enables automated

and real time graphical representations of service users' dimensional based representation of key personality functioning and treatment process variables. More specifically, this framework bridges the gap between research and practice, as beyond a valuable research tool, it also offers a unique optical representation of key indicators of service users dimensional profile relevant to their treatment engagement, severity levels, psychosocial characteristics and personality. Finally, this conceptual framework also entails a powerful incentive for clinicians and treatment staff' participation in research, as it clearly indicates clinical applicability of the data for conceptualization, treatment planning and identification of red flags and warning signs of individual attrition vulnerabilities. Its implementation could allow clinicians to identify vulnerable individuals who are less likely to engage in treatment, reformulate treatment planning and enhance treatment specificity. It is anticipated that future clinical investigations will employ similar empirically-driven assessment procedures and conceptual frameworks based on optical representation of dimensional diagnostic indicators that will advance this work one step further.

Training of the frontline workers is an important component in this process. Concerning the content of such courses, it would be valuable to focus on practice-related competencies to enhance practitioners' confidence in dealing with dimensional based conceptualizations and working with clients' dysfunctional characteristic adaptations. This would significantly reduce the risk of premature dropout, as shown in the current study. Moreover, training courses should focus on capacity building for specific interventions tailored to these important areas of dysfunctionality. Hopefully, these results will serve as a catalyst for cross -fertilization of knowledge by bridging the gap between research community and clinical practice and fostering the effective implementations of science based interventions.

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LIST OF APPENDICES

Appendix I: PhD summary

TREATMENT PROCESS EVALUATION: THE ROLE OF PERSONALITY FUCNTIONING

Introduction/background literature One of the core questions that have been put forward in the scientific addiction community refers to the effectiveness of treatment services and service users' social reintegration. Despite substantial evidence on drug treatment effectiveness, questions remain regarding which specific components of treatment hinder or facilitate recovery (Graff et al., 2009). Treatment effectiveness has been related to the time that patients spend in treatment and to the provision of sufficient services that adequately correspond to their needs (Hser, 2004). However, length of stay in treatment is not a direct mediator of sustained abstinence or changed drug use patterns, as retention appears to capture joint effects of many interrelated individual and process variables that may account for the observed variations (Brocato & Wagner, 2008). In line with this notion, Meier & Barrowclough (2009) posited that a priori conclusions that relate longer retention to positive outcome might be arbitrary, as some clients may stay in treatment longer because their presenting problems have not been adequately addressed.

Treatment engagement has been identified as a major factor contributing to clients' retention and key mediator of positive outcome (Simpson & Danserau, 2008). Nevertheless, it remains difficult to draw conclusions regarding specific predictors of clients' engagement. In this context, of particular concern is the complex relationship among clients' long lasting, enduring personality traits and their phenotypic expression within treatment process. A growing body of research provides evidence of the association of personality traits with relapse (i.e. Bottlender & Soyka 2005; Fisher, Elias & Ritz, 1998; Muller et al., 2008). Given these significant associations, it is somewhat surprising that to date only limited efforts have been made to identify their role within treatment process. The above findings point out that the association of personality traits with relapse may represent reliable indicators of major individual vulnerabilities that hinder treatment engagement. This may lead to considerable clinical and methodological benefits, especially in models testing the relationship of personality and treatment.

In this line, research distinguishes predisposed tendencies or personality traits from characteristic adaptations, which refer to specific behavioural patterns influenced by dispositional traits and situational variables. Characteristic adaptations are contextually sensitive psychological structures consisting of values, skills, schemas and relationships, which regulate individuals' responses and behaviours according to situational or contextual requirements (Ardelt, 2000). Even though characteristic adaptations facilitate the expression of traits, they do not appear to influence them (McAdams & Palls, 2006; Skodol et al., 2005). Personality trait profile determines the style of adaptation, while adaptations in turn influence the level of (mal) adjustment to the environment (McCrae & Costa, 1999). Acknowledging individuals' vulnerability on a trait level, it appears that dysfunction results from their phenotypic expression in the social context. Thus, individuals' tendency to shape and form social environments may not depend only on basic dispositions but rather on self-efficacy to develop effective adaptive capacities. The scientific debate on understanding psychopathology and formulating treatment guidelines based on multileveled conceptualization of personality dimensions has lately received increased support. Thus, further investigation of the role of personality traits and characteristic adaptations in treatment is of vital importance to solidify our knowledge in regards to potential clinical improvements that could be achieved if therapeutic interventions were tailored according to individual differences. This would enhance treatment providers' ability to facilitate individuals' adaptation and allow greater flexibility to respond to the diversified clients' needs. Likewise, the underlying assumption of personality-matching interventions (Conrod et al., 2010; Woick et al., 2009) is that individuals with different clusters of personality traits exhibit different treatment responses. Under this prism, it appears there is a need to explore whether and how personality dimensions are associated with or likely to influence individuals' treatment responses.

Methodology

Aims & Conceptualization The purpose of this study is to examine the extent to which a range of client personality dimensions contribute to or hinder treatment progress and individuals' engagement in treatment.

Research questions & hypotheses

The question that this study aims to answer is whether, to what extent, and in which way different personality dimensions contribute to or hinder treatment progress and individuals' engagement in treatment. Specifically:

1. Are there any significant differences in personality traits and characteristic adaptations between individuals who initiated treatment and those who drop-out during the outpatient preparation phase?

2. Do individuals' characteristic adaptations differ significantly among individuals who are more or less engaged? If so, can we explain variation in the engagement indicators according to the levels of clients' characteristic adaptations?

3. Do individuals' characteristic adaptations differ significantly among individuals who complete treatment and those who drop out? If so, can individuals' overall characteristic adaptations profile be used as a prognostic indicator of treatment completion?

4. Are there any significant differences in the characteristic adaptations dysfunctional levels on the basis of pre and during process assessment? And do these differ according to completion or drop out status?

Hypotheses

1 Higher maladaptive levels of personality dimensions will be associated with treatment initiation;

2 More dysfunctional characteristic adaptations will be predictors of treatment engagement; It is also expected that different characteristic adaptations will impact diverse segments of treatment engagement.

3 More dysfunctional characteristic adaptations will be prognostic indicators for treatment completion. It is expected that individuals engaged will have less maladaptive personality characteristics.

4 There will be an improvement of the dysfunctional characteristic adaptations levels from bassline to during process assessment. The clinically significant change will be higher on the treatment completion group

Study Design

The therapy process was examined in a naturalistic setting. The study tested relationships between key variables, examines whether there are baseline differences between clients with different personality characteristics and explores determinants of treatment initiation and engagement using pre- and during process measures. A multi-site, longitudinal follow up design was utilized to explore the relationship between service users' characteristic adaptations and

engagement. The selection of different treatment organizations provides geographical distribution and more representative sample.

The first part of the study examined whether service users' personality traits and characteristic adaptations predict treatment initiation (drop out vs completion) in a preparation outpatient setting. The second part of the study examined whether characteristic adaptations predicts treatment engagement and treatment completion in an inpatient setting. The third part of the study examined whether there are clinically significant changes between pre-and during process treatment, and whether these changes differ between treatment completers and drop out group.

Table 38: Summary of research questions

Research Question 1	**Are there any significant differences in personality traits and characteristic adaptations between individuals who initiated treatment and those who drop-out during the outpatient preparation phase?**
Hypothesis A1	Higher maladaptive levels of personality dimensions will be associated with treatment initiation;
A1: Personality traits and treatment initiation (Broad personality traits) (completion the outpatient preparation phase)	
Univariate analysis	Chi-square analyses were carried out on the categorical variables, and continuous variables were examined using independent samples t-tests. Univariate logistic regressions (since the dependent variable of treatment progress is a dichotomous variable)
Results	- Treatment completers were associated with significantly larger mean on *Conscientiousness* and Openness than the drop-outs and significant lower scores on Neuroticism - Comparison between completers and drop out group (in the outpatient treatment phase) showed no significant differences with regard to the pre-treatment characteristics gender, marital status, drug of choice, legal problems etc. - Results indicate that the treatment initiation group had significantly higher motivation for treatment (recognize their drug use problems; desire for help

	ready to receive treatment) and better psychosocial functioning before treatment than the drop out group. - In regards to psychosocial functioning, treatment dropouts were more likely to present with higher levels on depression and higher levels of anxiety and hostility than treatment completers.
Multivariate analysis	Logistic regressions of personality traits and treatment progress (backward selection)
Results	- Form the predictors included in the multivariate analysis, only Openness remained in the multivariate model after backward selection and did not reach significant levels. The pseudo R-square for the final model was 0.10 suggesting a small degree of improved prediction over having no predictors. Despite the significant differences found between the groups, the capacity of personality traits on predicting treatment initiation is relatively low. - From the covariates treatment readiness was the most influential predictor of treatment completion with 26% increase in treatment completion for each unit increase in readiness for treatment. Desire for help also proven to be significant predictor, for every 1-unit increase in treatment readiness (1 scale point) we can expect a .1.08 increase in odds of completing treatment. - From the psychological wellbeing, depression also remained significant predictor in the final model with odd ration .93, for every unit increase in depression there is 7% decrease likelihood to complete treatment.
A1: Personality traits and treatment initiation (Lower level personality traits) (completion the outpatient preparation phase)	
Univariate analysis	Univariate logistic regressions
Results	From the univariate regressions 3 control variables and 8 lower order dimensions met the inclusion criterion
Multivariate analysis	Logistic regressions of personality traits and treatment initiation (backward selection)
Results	- In the final regression model from the eight lower order dimensions that were significant and included in the backward stepwise selection, only two remained in the final step both significant. - EXP(B) value indicates that the trait depression is raised by one unit the odds ratio is 0.88 That is for one unit increase in *Neuroticism* there was 12% decrease likelihood to initiate treatment. - Action also remained a significant predictor of treatment initiation, with odd ration 1.13, indicating that individuals scoring high in these dimensions were 13% more likely to initiate treatment than those with low score [OR] =1.13, Wald =3.53, p =.058, 95% CI [0.9, 1.3]. The prediction at the lower order

	personality dimension had moderate to low capacity. - From the covariates, significant association between treatment readiness and likelihood of treatment completion. For every 1-unit increase in treatment readiness (1 scale point) we can expect a 1.26 increase in the log odds of completing treatment. In other words, as treatment readiness increases so does the chance of a service user completing treatment by 26%.
A2	**Characteristic adaptations and treatment initiation (completion the outpatient preparation phase)**
Broad characteristic adaptation and treatment initiation	
Univariate analysis	- For the second part of the research question one (A2), similar steps were taken to construct a multivariate logistic regression model for predicting treatment completion from characteristic adaptations. - After examining the frequency distributions and inter-correlations (to assess potential collinearity) among the candidate predictor variables, univariate comparisons between those who became engaged in treatment (n=140) versus those who did not (n=75) using chi-square and t tests was conducted. In the second step, variables that differed at the p 0.10 significance level were then entered into a multivariate logistic regression model
Results	To test the hypothesis that treatment completers and drop-outs were associated with statistically different means on characteristic adaptations, an independent samples t test was conducted for both broad and facet level.
Broad level	- In the Social Concordance domain, (the ability to value someone's identity, withhold aggressive impulses towards others and to work together with others), treatment completers (M=5.49, SD= .89) were significantly more likely to have higher adaptive capacities in this domain than the dropouts (M=5.13, SD=.80, t (2.83), p=.005.). - Identity domain: Dropouts were more likely to lack the ability to see oneself and one's own life as stable, integrated and purposive (M= 3.59, SD= .65, t (2.81), p= .005) than the treatment completers (M=3.88, SD= .73). - *Relational capacities*: treatment completers had significantly higher capacity to genuinely care about others, be able to communicate personal experiences, and to hear and engage with the experiences of others (M=4.27, SD=.80, t (2.38), p= .018 compare) compared to the treatment dropouts (M=4.03, SD= .61)
Facet level	- Treatment completers had higher scores in frustration tolerance (M= 2.47, SD= .52, t (1.96), p=.051) (that is the capacity to cope with disappointments and setbacks) than the drop out group (M= 2.32, SD= .47); and were more able to withhold aggressive impulses towards others (Ag gression regulation), (M= 2.88, SD= .71), t (2.42), p= .016 compared to dropouts (M= 2.62, SD= .79).

	- Drop out group were significantly less likely to experience that others understand what they feel and believe (Feeling recognized), (M= 2.50, SD=. 55), t (2.23), p= .027) than the completers (M= 2.70, SD= .60) and were significantly less capable to value someone's individual needs and personal identity (Respect), (M= 2.86, SD= .49, t (2.61), p= .010.) - Treatment completers were significantly more likely to have the capacity to make life meaningful by creating the means as well as the opportunities for achievement and organizing time in line with one's goals (Purposefulness) (M= 2.77, SD= .57), t (3.09), p= .002) than the treatment dropouts (M=2.51 SD = .56) and had higher levels on the Enjoyment facet (the capacity to enjoy without feeling guilty)(M= 2.45, SD= .62), t(2.69), p= .008) in comparison to treatment drop out group (M= 2.21, SD= .55). - Finally, treatment completers were significantly more likely to have the ability to share sensitive personal experiences with other people (Intimacy) (M=2.77, SD= .58), t (2.08) p= .38 and to internalize the values and norms of social collaboration and to behave in accordance to these (Trustworthiness) (M=2.62, SD= .60), t(2.12), p=.035 compare) compared to treatment dropouts ([(M=2.60, SD= .47) and (M=2.46, SD= 46) respectively.
Multivariate analysis	- Multivariate logistic regression analysis was performed with treatment completion as the dependent variable. Predictor variables with P < .10 in the univariate analyses were entered in a full multivariate model. Subsequently, non-significant variables were removed, one by one, until –2 log likelihood deteriorated significantly. Goodness of fit of the model was determined by the Hosmer-Lemeshow test, and the Nagelkerke R^2 was used for the pseudo proportion of variance.
Results	
Broad Level	- Univariate comparisons between these groups' identified 8 candidate variables that met the inclusion criteria, four broad domains as predictors and three control variables from which two were motivational variables (desire for help and treatment readiness), and one psychological (depression). Gender and age were also entered in the first block of the regression equation (Table). The final regression model resulted in a total of four statistically significant predictors. - The results showed that social concordance remained a strong significant predictor even when adjusted for a set of covariates, and that 85% increase of treatment completion would result for each unit increase in the social concordance score [OR] =1.85, Wald =19.87, p =.012, 95% CI [1.1, 1.3]. - The final treatment progress model indicates that after adjusting for the other predictors, those with more adaptive levels of social concordance were about 85% more likely to complete treatment than those with more maladaptive levels. EXP(B) value indicates that when social concordance is raised by one unit the odds ratio is 1.85 times as large and therefore individuals with more

	adaptive functioning on social concordance were 1.85 more times likely to complete treatment. - The odd ratios further indicated that if depression symptoms increases by one unit the odds for treatment completion decrease 0.93. That is, for every unit increase in depression there is 7% decrease likelihood to complete treatment [OR] =0.93, Wald =5.90, p =.015, 95% CI [0.8, 0.9]. - An increase of treatment readiness score by one of the five-point scale was found to increase the odds by 26% of treatment completion. Participants who were more ready to receive treatment had 26% the odds of completing treatment versus those were less ready for treatment [OR] =1.26, Wald =23.45, p =.012, 95% CI [1.1, 1.3]. - Finally, high desire for help group is 1.12 times more likely to complete treatment than low desire for help group. Likewise, if desire for help increases by one unit the odds of treatment completion increase 1.12-fold.
Facet level	- Similar procedures were used to construct the multivariate logistic regression for the facet level adaptation as predictors of treatment completion. - Form the predictors included in the multivariate analysis, only four remained in the multivariate model after backward selection (Table 3), namely Aggression regulation, Purposefulness, Cooperation and Respect. - A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between treatment completers and dropouts χ^2 (chi square = 73.308, p < .000 with df = 8). Nagelkerke's R^2 of .427 indicated a moderately strong relationship between prediction and grouping. - The Wald criterion demonstrated that purposefulness (p= .023), aggression regulation (p = .034) and respect (p= .035) made a significant contribution to prediction of treatment completion. - An increase on purposefulness score by one of the four-point scale was found to double the odds of treatment completion. EXP(B) value indicates that when purposefulness is raised by one unit the odds ratio is 2.3 times as large. - Higher levels of respect had a 2.95 times greater odd of completing treatment than those with lower levels [OR] = 2.95, Wald = 4.50, p =.034, 95% CI [1.0, 8.4]. - Service users with more maladaptive levels on aggression regulation were 1.88 times more likely to drop out than those with more adaptive levels. This means, those individuals with high maladaptive range of aggression regulation have an increased risk of about 90% to drop-out compared to those without maladaptive functioning on this dimension [OR] = 1.88, Wald = 4.20, p =.040, 95% CI [1.0, 3.4]. - Higher adaptive range in cooperation had a 2.88 times greater odds of

	completing the preparation phase than those with less functional cooperation capacities, although this result fell short of the 0.05 significance level (p=.089).
	- Based on the above finding it can be said that personality traits provide sufficient information to sketch individuals profile and the likelihood for classification to belong to the drop out or completion group. However, the predictive ability to draw conclusions of whether there are some specific traits that directly predicts drop out is low.
Research Question 2	**Do individuals' characteristic adaptations differ significantly among individuals who are more or less engaged? If so, can we explain variation in the engagement indicators according to the levels of clients' characteristic adaptations?**
Hypothesis 2	More dysfunctional characteristic adaptations will be predictors of treatment engagement; It is also expected that different characteristic adaptations will impact diverse segments of treatment engagement.
B1: Broad and facet level characteristic adaptation and counselling rapport	
Univariate analysis	- To narrow the range of predictors in the final model, a series of bivariate regressions were used for testing the association between counselling rapport, broad and facet level of characteristic adaptations and the covariates. Predictors not meeting a conservative selection criterion of $p<0.25$ were excluded from further analyses in order to prevent unstable regression models and loss of power through the inclusion of redundant variables.
Broad level multivariate analysis	- Results showed that 12 variables met the inclusion criterion (see Table 1.3, p. 3). Out of these, all broad domains were significant predictors of counselling rapport, ranging from (β=.34; Responsibility) to (β=.39; Self-control). Service users control variables that were incorporated were age, gender, legal problems, depression, anxiety, desire for help and treatment readiness.
	- At Step 1, the multivariate analysis shown that the demographic and motivational variables explained (control variables) explained 34 % of the variance in counselling rapport. - Treatment readiness (β = .542) and desire for help (β= .188) were strong predictors of counselling rapport, indicating that higher service user's motivation was related to better counselling rapport. - In addition, legal problems (β=.159, p= .003), depression (β= -.238, p > .001) and anxiety (β= -.134, p = .014) were also significant predictors of counselling rapport. - After entry of the five higher-order dimensions at step two, the total variance explained by the model was 41 %, F (5, 224) = 35.778, p= .000. The final

	stepwise regression model comprised five predictors, namely two higher-order dimensions and three control variables (see Table 1.3, p. 3). - **In the final model only Self-Control (β= .195, p=.001) and Relational Capacities (β= 12.1, p=. 034) remained significant predictors of counselling rapport, after statistical adjustment for effects of the other covariates.** - Identity integration, Responsibility and Social concordance were significant predictors of counsellor rapport in the expected direction in the univariate analysis, but failed to reach significance in the multivariate model. -
Facet level multivariate analysis	- The final stepwise regression model comprised six predictors, namely three lower-order dimensions and three control variables (see Table 1.4, p. 4). - **The multivariate regression analysis revealed that after statistical adjustment for effects of the other covariates, three lower-order dimensions Self - reflective functioning, Aggression regulation and Enduring relationships, remained significant predictors of counselling.** - Higher maladaptive range of lower-order dimensions were expected to predict the alliance negatively. In support of this, Self-reflective functioning (β=.163, p = .002) was highly significant predictor of counselling rapport in the expected direction. Likewise, high scored individuals in the ability to withhold aggressive impulses towards others rated higher counselling rapport (Aggression regulation, β= .107, p=.036). Finally, Enduring relationships (β= .105, p=.042) was also significant predictor of good counselling rapport even when adjusting for all other predictors. - Although, higher levels on Emotional Regulation and Intimacy were strong predictors of counselling rapport at the univariate model contrary to expectations, there were not significant in the multivariate model. - From the motivational variables, treatment readiness (β= .398, p > .001) was the strongest predictor of counselling rapport and desire for help (β= .121, p= .011) remained significant predictor in the multivariate model. Finally, depression and legal problems were significant predictors of counselling rapport at the univariate analysis, but only legal problems (β= .143, p = .001) remained significant at the multivariate model.
B2: Broad and facet level characteristic adaptation and treatment participation	
Univariate analysis	- To narrow the range of predictors in the final model, bivariate regressions were used for testing the association between treatment participation, higher and lower order dimensions of characteristic adaptations and the covariates as listed in Table 1.5 (p. 6). Predictors not meeting a conservative selection criterion of p<0.25 were excluded from further analyses in order to prevent unstable regression models and loss of power through the inclusion of

	redundant variables
Broad level multivariate analysis	- At Step 1, the multivariate analysis shown that the demographic and motivational variables explained 23,9 % of the variance in treatment participation F (7, 328) =14,755, p =.000. - At step 2, the control variables and the higher-order dimensions of characteristic adaptations explained 34,2% of the variance in treatment participation F (11, 314) = 14,304, p > .000. The four out of five higher-order dimensions accounted for a significant proportion of variance in treatment participation. - Examination of the individual beta weights of the higher-order dimensions showed that Social concordance (β=. -29, p >.001) was highly significant predictor of treatment participation, indicating service users who have the ability to value someone's identity, withhold aggressive impulses towards others and to work together with others reported higher scores of treatment participation. - Self-control domain (β= .22.1, p >.00) significantly predicted treatment participation. - The domain Relational capacities was also significant predictor of treatment participation (β= 28, p <.001), indicating that higher adaptive scores on the capacity to genuinely care about others, to be able to communicate personal experiences, and to hear and engage with the experiences of others, are predicting better treatment participation. - Finally, Responsibility domain (β= .16, p=.014) predicted treatment participation, indicating that high scoring service users on the capacities to set realistic goals and to achieve these goals in line with the expectations they have generated in others, reported higher treatment participation levels.
Facet level multivariate analysis	- The final stepwise regression model comprised nine predictors, namely four facet level adaptations and five control variables (see Table 1.6, p. 9). **The multivariate regression analysis revealed that four facet levels Emotional regulation, Intimacy, Trustworthiness and Respect accounted for additional variance in treatment participation after statistical adjustment for effects of the other covariates.** - Individuals who scored low on Emotional regulation, the capacity to tolerate and manage the emotions and to control their intensity, course, and expression, had lower levels of treatment participation. - Low levels of Intimacy that is the ability to share sensitive personal experiences with other people, was also expected to predict low treatment participation. That was also confirmed, as low intimacy levels significantly negatively predicted treatment participation (β= .194, p > .000). - Trustworthiness was also significant predictor of treatment participation (β=

	.151, p = .008). - Service users with low scores on the internalized values and norms of social collaboration and ability to behave in accordance to these, were participating less in the treatment process - Respect was also significant predictor of treatment participation (β= .158, p = .005), indicating that the capacity to value someone's individual needs and personal identity is predicting treatment participation. - From the motivational variables, treatment readiness (β= .398, p > .001) and desire for help (β= .121, p= .011) were highly significant predictors of treatment participation in the multivariate model, whereas form psychological wellbeing depression and anxiety were significant at the univariate model, but not at the multivariate model.
B3: Broad and facet level characteristic adaptation and treatment satisfaction	
Univariate analysis	- Similar procedure was followed for the bivariate regressions for testing the association between treatment satisfaction, broad and facet level characteristic adaptations and the covariates. Predictors not meeting a conservative selection criterion of p<0.25 were excluded from further analyses in order to prevent unstable regression models and loss of power through the inclusion of redundant variables
Broad level multivariate analysis	- At Step 1, the multivariate analysis shown that the demographic and motivational variables (control variables) explained 28,5 % of the variance in treatment satisfaction, F (6, 335) =21,866, p <.000. - At step 2, the control variables and the broader level characteristic adaptations explained 31,1% of the variance in treatment satisfaction F (7, 314) = 19,751, p < .000. From the broader level adaptations, only the Relational capacities was significant predictors of treatment satisfaction, accounting for 2,6 % additional proportion of variance with a value for adjusted R^2 change of .026 - The motivational components were significant predictors of treatment satisfaction, with high scoring service users on readiness and desire for treatment, had significantly better satisfaction with services received with (β=.396, p >.001) and (β=.148, p =.005) respectively.
Facet level multivariate analysis	- The final stepwise regression model comprised six predictors, namely two lower-order dimensions and four control variables (see Table 1.8, p. 11). **The multivariate regression analysis revealed that two facet levels Intimacy (β= .118, p = .038) and Cooperation (β= .134, p = .019) accounted for additional variance in treatment satisfaction**. after statistical adjustment for effects of the other covariates
Research Question 3	**Do individuals' characteristic adaptations differ significantly among individuals who complete treatment and those who drop out? If so, can individuals' overall characteristic adaptations profile be used as a prognostic**

	indicator of treatment completion?
Hypothesis 3	More dysfunctional characteristic adaptations will be prognostic indicators for treatment completion. It is expected that individuals engaged will have less maladaptive personality characteristics.
Univariate analysis	Independent samples t-tests to examine the continuous variables. Univariate logistic regressions (since the dependent variable of treatment progress is a dichotomous variable)
C1: Results Broad domains Characteristic adaptations	- As sample t-tests are reported there were significant group differences in all five broad characteristic adaptation between treatment completers and dropouts. - In the social concordance domain (the ability to value someone's identity, withhold aggressive impulses towards others and work together with others) treatment completers (M=4.87, SD= .69) were associated with statistical significant larger mean social concordance than dropouts M=4.87, SD=.89, t (-9.13), $p < .001$. - The two groups were also significantly different in the Identity domain. Dropouts were associated with lower mean on the ability to see oneself and one's own life as stable, integrated and purposive M= 3.67, SD= .56, t (-7.81), $p < .001$) than treatment completers (M=3.88, SD= .73). - In the *Relational capacities*, treatment completers had significantly higher capacity to genuinely care about others, be able to communicate personal experiences, and to hear and engage with the experiences of others (M=4.45, SD=.64) compared to the treatment dropouts M= 3.93, SD= .59 t (-7.56), $p < .001$. - Treatment completers were associated with significant larger mean on Self-control (M= 4.75, SD= .78) and Responsibility (M= 4.37, SD=.73) than the dropouts M=3.88, SD= .73, t (-10.15), $p < .000$ and M= 3.80, SD= .65, t (-7.17), $p < .001$ respectively.
C2: Results Facet level Characteristic adaptation	- Treatment completers had significant differences on the facets of Self-control from drop out group, on emotional regulation [M= 2.66, (SD= .47) vs M= 2.15, (SD= .38) t = (-8.54) $p < .001$] and effortful control [M=2.47, (SD= .55) vs M= 1.97, (SD= .48) t = (-8.97) $p < .001$]. - Dropouts had significantly lower means on the Identity facets than treatment completers with Self-Respect [M= 2.66 (SD= .59) vs M= 3.01, (SD= .56) t = (-5.37) $p < .001$]; Stable self-image [M= 2.38, (SD= .56) vs M= 2.83, (SD= .54) t= (-7.24) $p < .001$]; Self - reflective functioning [M= 2.30, (SD= .49) vs M= 2.68, (SD= .57) t= (-6.24) $p < .001$]; Enjoyment [M= 2.37, (SD= .48) vs M= 2.74 (SD= .53) t= (-6.52) $p < .001$]; and Purposefulness [M= 2.68, (SD= .48) vs M= 2.97 (SD= .46) t= (-5.43) $p < .001$]. - In regards to Relational capacities, dropouts had more maladaptive lower

	scores than the treatment completers on Intimacy [M= 2.58, (SD= .46) vs. M= 2.92, (SD= .51) t (-6.20) p < .001]; Enduring relationships [M= 2.55, (SD= .50) vs. M= 2.88, (SD= .51) t (-5.80) p < .001]; and Feeling recognized [M= 2.54, (SD= .52) vs. M= 2.92, (SD= .48) t (-6.80) p < .001]. - Furthermore, the two groups differ significantly on the Responsibility domain, with dropout group scoring significantly lower than treatment completers on the Responsible industry [M= 2.40, (SD= .50) vs. M= 2.83, (SD= .57) t (-7.08) p < .001] and Trustworthiness [M= 2.60, (SD= .47) vs. M= 2.91, (SD= .52) t (-5.54) p < .001]. - For Social concordance the two groups differed on Aggression regulation [M= 2.53, (SD= .71) vs. M= 3.17, (SD= .57) t (-8.70) p < .001], Frustration tolerance [M= 2.21, (SD= .38) vs. M= 2.59, (SD= .47) t (-7.89) p = .028], Cooperation [M= 2.69, (SD= .48) vs. M= 3.05, (SD= .49) t (-6.62) p < .001] and Respect [M= 2.70, (SD= .44) vs. M= 3.00, (SD=.43) t (-6.14) p < .001]
C1: Multivariate analysis – Broad Characteristic Adaptations	Hierarchical multiple logistic regressions of characteristic adaptations and treatment progress - The third set of analyses looked at the degree to which variables that significantly differed between treatment completers and dropouts predicted treatment drop-out. For these analyses, a hierarchical logistic regression analysis was utilized, with treatment progress as the dependent variable, motivational and treatment engagement variables were entered into the first block and the predictors of interest characteristic adaptations into the second block. Variables significant in the initial (univariate) regression analyses were simultaneously entered into the final logistic regression model (enter method), designed to determine whether these predictors were independently associated with treatment drop-out above and beyond the engagement and motivational variables.
Results	- **Form the predictors included in the multivariate analysis, only self-control and social concordance remained significant in the multivariate model**. - Prediction success overall was 85.7% (87.7% for treatment completers and 83.1% for drop out group. - A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between treatment completers and drop-outs ($\chi 2$ =20.90, df =5; p <0.01). - Nagelkerke's R^2 of 67.1 indicated that the three predictors explained about 67% of the total variance in treatment drop-out. The Wald criterion demonstrated that only the two broad characteristic adaptations self-control and social concordance made a significant (independent) contribution to prediction (p = 0.05). - The final treatment progress model indicates that after adjusting for the other

	predictors, those with higher maladaptive range of self-control are twice as likely to drop-out compared to those without [OR] =2.62, Wald =5.60, p =.018, 95% CI [1.1, 5.8]. - EXP(B) value indicates that when social concordance is raised by one unit the odds ratio is 2.21 times as large and therefore individuals with more adaptive functioning on social concordance were 2.21 more times likely to complete treatment. - From the first block of predictor treatment engagement and specifically treatment participation [OR] =1.21, Wald =13.68, p < .001, 95% CI [1.1, 1.2] and counselling rapport [OR] =1.15, Wald =9.21, p =.002, 95% CI [1.1, 1.2] were the most influential predictors of treatment completion. - From the motivational variables treatment needs and treatment readiness accounted for a significant amount of variance. - From the psychological wellbeing, anxiety and depression were not significant predictors in the final model with odd ration.
C2: Multivariate analysis - Lower order characteristic adaptations	- Univariate comparisons identified six predictors for the multivariate model: Emotion Regulation, Enjoyment, Purposefulness, Intimacy, Feeling recognized, Aggression regulation, Frustration tolerance, Cooperation, Respect. - As covariates, beyond gender and age, motivational variables (desire for help, treatment readiness, treatment needs and pressure for treatment), treatment engagement variables (counselling rapport, treatment participation and treatment satisfaction) and psychological variables (depression and anxiety) were included into the model with the ENTER mode at block one. - Variables significant in the initial (univariate) regression analyses were simultaneously entered into the final logistic regression model (enter method), designed to determine whether these predictors were independently associated with treatment drop-out above and beyond the engagement and motivational variables
Results	- **Form the predictors included in the multivariate analysis, only three remained in the multivariate model after forward selection, namely Effortful control Aggression regulation and Stable self-image.** - A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between treatment completers and dropouts χ^2 (chi square = 36.942, p < .001 with df = 3). - Nagelkerke's R^2 of .704 indicated a strong relationship between prediction and grouping. In block 0, the probability of a correct prediction is 56.8 %. - In the final model the overall predictive accuracy was 87.0% (89.9% for treatment completers and 83.5% for drop out group).

	- The Wald criterion demonstrated that effortful control (p= .004), aggression regulation (p > .001) and stable self-image (p= .012) made a significant contribution to prediction of treatment completion. - Results indicated that an increase on effortful control score by one of the four-point scale was found to double the odds of treatment completion. .
Research Question 4	**Are there any significant differences in the characteristic adaptations dysfunctional levels on the basis of pre-and during process assessment? And do these differ according to completion or drop out status?**
Hypothesis 4	There will be an improvement of the dysfunctional characteristic adaptations levels from bassline to during process assessment. The clinically significant change will be higher on the treatment completion group
Univariate analysis	Paired –t test (N = 70) Comparisons within groups were performed in order to estimate treatment response, i.e. whether significant changes on the characteristic adaptations had occurred from baseline to follow-up
D1: Results-Broad characteristic adaptations	- **Results show that all four out of five broad characteristic adaptations increased significantly, except social concordance that remained unchanged at the second inpatient time point**. - More specifically, there was a significant difference in Self-control between baseline assessment (M= 4.04, SD= 0.73) and during process assessment (M = 4.83, SD = 0.74), t (69) = 3.95, p < .001. - Similarly, significant differences were traced in Identity domain between pre-treatment (M = 3.74, SD = 0.56) and during treatment assessment (M = 4.03, SD = 0.58), t (69) = - 4.50, p < .001. - *Relational capacities* was also significantly improved between the two-time points (M = 4.06, SD = 0.70) with (M = 4.21, SD = 0.61), t (70) = - 2.16, p = 0.05. - Significant differences were traced also for Responsibility domain between pretreatment (M= 3.73, SD = 0.74) and during treatment (M= 4.16, SD = 0.75), t (69) = - 5.54, p < .001. - No significant differences were traced in social concordance between baseline assessment (M = 5.29, SD = 0.80) and during process assessment (M = 5.28, SD = 0.67), t (69), p = .140. - These findings suggest an improvement of maladaptive personality functioning during the time period spend in treatment for all broad characteristic adaptations except social concordance.

D2: Results-Facet level characteristic adaptations	- The analysis at the facet level confirmed the associations found at the broad domains between baselines and during process follow up. - The results showed that all facet level characteristic adaptations increased significantly at the second inpatient assessment point, except frustration tolerance, cooperation and respect all underlying facets of social concordance.
Within-group comparisons Repeated measures	- A series of mixed between-within subject analyses of variance were conducted to compare scores on the characteristic adaptations between drop out group and completers across two time periods (outpatient preparation - Time 1; and inpatient during process follow up - Time 2.
Results	- The analyses between treatment completers and drop-outs indicated significant advantages to the completers over drop out group. - The between treatment progress (completers or dropouts) and time (baseline intake to during process follow up) was significant and in the expected direction in all broad characteristic adaptations except the social concordance domain, consistent with the separate t tests. - More specifically, the three out of five broad domains there had a significant main effect for time (i.e. the change between intake and during process follow up), with Self-control Wilks' Lambda = .86, F (1, 67) = 10.60, p = .002, partial eta squared = .14; , Identity Wilks' Lambda = .82, F (1, 67) = 14.24, p < .000, partial eta squared = .18;, and responsibility Wilks' Lambda = .73, F (1, 67) = 24.69, p < .001, partial eta squared = .27. - No significant main effect for time was traced on Social concordance Wilks' Lambda = .99, F (1, 67) = 0.11, p = .732, partial eta squared = .002, and on *Relational capacities* Wilks' Lambda = .97, F (1, 68) = 2.17, p = .150, partial eta squared = .03, indicating that the degree of change between intake baseline and during process follow up was not significant. These results suggesting that remaining in treatment is related to significant improvement of the in self-control, identity and responsibility but not for social concordance and *Relational capacitie*s. - In regards to the main effect of treatment progress, comparing the two groups, the results indicated that treatment completers had significantly more functional characteristic adaptations in all five broad domains then the drop out group. - The main effect of the between group comparison in self-control domain was significant F (1, 67) = 37.16, p < .001, partial eta squared = .35, suggesting highly significant difference in self-control scores between drop-outs and treatment completers. - For social concordance, comparing the two groups the main effect was significant, F (1, 67) = 16.34, p < .001, partial eta squared = .20. These findings suggests a significant difference in social concordance levels between the two groups, with treatment completers showing higher scores

	thus less pathological. - Likewise, the between group comparison indicated highly significant effect for the identity domain F (1, 67) = 24.09, p < .001, partial eta squared = .24 and responsibility domain F (1, 67) = 14.09, p < .001, partial eta squared = .17, with treatment completers exhibiting significantly higher adaptations levels over the drop out group. The comparison between treatment completers and drop out group for the *Relational capacities*, the analyses revealed significant main effect F (1, 67) = 14.09, p < .001, partial eta squared = .17. - These findings suggest that there is significant difference on the degree of change of dysfunctional characteristic adaptations between treatment completers and drop out group. - They also suggest that time spend in treatment provide therapeutic gains in terms of change of the dysfunctional characteristic adaptations. And that service users who complete treatment have more functional characteristic adaptations at the baseline then drop out group and improve their dysfunctional levels more than service users who drop out of treatment.
Reliable and clinically significant change	- In order to investigate clinically significant change for the different facets of the five broad domains, calculation of the percentage was conducted for service users who achieved reliable change, the percentage of service users who passed the cut-off point and moved from a dysfunctional range to a normative range, and the percentage who had both reliable change and moved into a normative range as measured by the SIPP-118 (Jacobson & Truax, 1991). - Reliable change was calculated using the formula: RC = 1.96 × √ 2(SE)2, with SE = SDclinical × √ 1 – α. - A cut-off point for movement into a normative range was computed using the following formula: (SDnormal × Mclinical + SDclinical × Mnormal)/(SDnormal + SDclinical). - Means, standard deviations, and alpha scores for the different facets were used from Feenstra, Hutsebaut, et al. (2011). - Clinical deterioration was also computed
Results	- All broad and facet levels, the lowest (and thus more pathological) scores were reported by the drop out group. - Differences between the completers and the drop out group were significant (p < .001) for both domain and facet scores - For Self-control: - A far higher proportion of completers (17/46; 37% of subgroup) than non-completers (1/24; 4.2% of subgroup) pass the cut-off point on emotional regulation, as well as met the criteria for reliable change, with completers

	(9/46; 16.9%) for drop out group (2/24; 8.3%). - Likewise, greater percentage of treatment completers (9/46; 19.6%) and drop out group (0/24; 0%) pass the cut-off point and the criteria for reliable change (10/46; 21.7%) and (2/24; 8.3%) on effortful control respectively. - Finally, treatment completers had higher proportion of clinical significant change on both emotional regulation (6/46; 13%) and effortful control (3/46; 6.5%), than the drop out (1/24; 4.2%) and (0/24; 0%) respectively. - For Identity Integration: - The completers group had higher percentage of passing the cut-off point on all facets (Self-respect: 26/46; 56.5%), (Stable self-image: 24/46; 52.2%), (Self-reflexive functioning: 12/46 26.1%) , (Enjoyment: 25/46; 54.3%) and (Purposefulness: 22/46; 47.8%) than the drop-outs with (SR: 7/24; 28%), (SSI: 1/24; 4.2%), (SRF: 0; 0%), (EN: 2; 8.0%) and (PU: 4; 16.7%), respectively. - The overall clinical significance for each facet of Identity integration indicated significant advantage of the treatment completion group. - For the Self-Respect facet 8/72; 11.1% of the overall sample had clinical significant change, from those 4/46; 8.7% were from treatment completers group and 4/24; 16% from the drop out group. - For Stable self-image 9/69 (13.0%) pass the clinical significance from the overall sample, with 1/24; (4.2%) from the drop out group and 8/46; (17.4%) from treatment completers. - For the Responsibility: - The vast majority who pass the cut of point (the vertical red line) is from the treatment completer group for both RI 19/47; (40.4%) and TR (17/47; (36.2%), while only 4/25; (16.0%) for RI and 1/25; (4.0%) for TR from the drop out group. - While in the reliable change index the drop out group had higher percentage of change RI: 4/25; (16.0%) and TR: 4/25; (16.0%), then the completer group with RI: 7/47; (14.9%) and TR: 6/47; (12.8%). - The overall clinical significance 6 are from treatment completers and 2 from drop out; while for TR the overall was 4 (5.6%) all from the treatment completer group - For the Relational domain: - A much greater percentage of completers pass the cut-off point on IN: (25/47; 53.2%); ER: (14/47; 29.8%) and FR: (21/47; 45.7%) than the drop out group with IN: (3/25; 12%); ER: (3/25; 12%); and FR: (3/25; 12%), as well as met the criteria for reliable change, with completers for IN: (10/47; 21.3%), ER: (6/47; 12.8%) and FR: (7/47; 15.2%) while drop out group IN: (2/25; 8.0%),

	ER: (3/25; 12%) and FR: 1/25; 4.0%) - Consequently, treatment completers had also greater percentage of clinical significant change IN :(9/46; 19.6%), ER: and FR:, then the drop out group (0/24; 0%). - For the Social concordance domain: - Treatment completers group were predominantly higher on both pass the normative cut of point (above the vertical red line) and had greater percentage of reliable change (above the dotted-up line), thus had greater proportion of clinical significant change. - More specifically, the proportion of treatment completers that pass the normative cut of point was much greater AR: 18/46; (39.1%), FT: 19/47; (41.3%), CO: 19/46; (41.3%) and RE 19/46; (40.4%) then the drop out group only one individuals pass (above the vertical red line) the AR: 1/24; (4.2%); two individuals 2/25 ; (8.0%); and five for both CO: 5/24 ; (20.8%) and RE: 5/25 ; (20%). - Likewise, major differences were traced on the reliable change index between the two groups. Treatment completers had higher proportion on all social concordance facets AR: 10/46; (21.7%) vs 3/24; (12.5%), FT 5/47; (10.6%) vs 1/ 25; (4.0%), CO: 5/46; (10.9%) vs 2/ 24; (8.3%) and RE: 4/47; (8.5%) vs 2/25; (8.0%). Therefore, while the treatment completers group had a relatively moderate clinical significant change with AR: 7/46; (15.2%), FT: 4/47; (8.5%), CO: 4/46; (8.7%) and 3/46; (6.4%), the drop out group had only one individual CO: 1/24; (4.2%) on cooperation and one on the respect 1 (4.0%).

Appendix II: Main predictors of treatment initiation, engagement and completion

Table 39. Broad characteristic adaptations predictors of treatment initiation, treatment engagement and treatment completion (Adjusted model)

	RQ1	RQ2			RQ3
		Treatment Engagement			
Characteristic adaptations broad domains (IV)	Treatment initiation	Counselling rapport	Treatment participation	Treatment satisfaction	Treatment completion
Self-Control	O	X+	X+	O	X+
Identity Integration	O	O	O	O	O
Responsibility	O	O	X+	O	O
Relational capacities	O	X+	X+	X+	O
Social concordance	X+	O	X+	O	X+

Table 40. Facet level characteristic adaptations predictors of treatment initiation, treatment engagement and treatment completion (Adjusted model)

	RQ1	RQ2			RQ3
		Treatment Engagement			
Characteristic adaptations facet level (IV)	Treatment initiation	Counselling rapport	Treatment participation	Treatment satisfaction	Treatment completion
Self-Control					
Emotion Regulation	O	O	X+	O	O
Effortful Control	O	O	O	O	X+
Identity Integration					
Self-Respect	O	O	O	O	O
Stable self-image	O	O	O	O	X+
Self - reflective functioning	O	X+	O	O	O
Enjoyment		O	O	O	O
Purposefulness	X+	O	O	O	O
Responsibility					
Responsible industry	O	O	O	O	O
Trustworthiness	O	O	X+	O	O
Relational capacities					

Intimacy	O	O	X+	X+	O
Enduring relationships	O	X+	O	O	O
Feeling recognized	O	O	O	O	O
Social concordance					
Aggression regulation	X+	X+	O	O	X+
Frustration tolerance	O	O	O	O	O
Cooperation	O	O	O	X+	O
Respect	X+	O	X+	O	O

Appendix III: Broad and facet level characteristic adaptations

Characteristic adaptations	
Broad domains	**Facet level**
Self-control The capacity to tolerate, use and control one's own emotions and impulses	Emotional Regulation - The capacity to tolerate and manage the emotions you have and to control their intensity, course, and expression
	Effortful control: The ability to focus concentration and direct impulses through conscientious effort
Identity integration Coherence of identity; the ability to see oneself and one's own life as stable, integrated and purposive	Self-respect - The capacity to feel that you are worthy, and to know that others or yourself have no right to harm you physically or emotionally
	Stable self-image - To experience an inner sense of continuity/sameness of self across time and situations
	Self-reflexive functioning - The capacity to understand the possible meanings of and causal connections between internal and external experiences, as well as the ability to identify reasons for things happening within yourself rather than constantly trying to find answers in the world outside
	Enjoyment - The capacity to enjoy without feeling guilty
	Purposefulness - The capacity to make life meaningful by creating the means as well as the opportunities for achievement and organising time in line with one's goals

Responsibility The capacity to set realistic goals and to achieve these goals in line with the expectations you have generated in others	Responsible industry - The capacity to set realistic goals, and to achieve these through effective and responsible constructive actions
	Trustworthiness - That one has internalized the values and norms of social collaboration and is normally able to behave in accordance to these
Relational capacities The capacity to genuinely care about others as well as feeling cared about them, to be able to communicate personal experiences, and to hear and engage with the experiences of others often but not necessarily in the context of a long-term, intimate relationship	Intimacy - The ability to share sensitive personal experiences with other people
	Enduring relationships - The capacity to love and feel loved in order to form and maintain long-term, intimate relationships; also referred to as the capacity for "healthy attachment"
	Feeling recognized - The experience that others understand what you feel and believe
Social concordance The ability to value someone's identity, withhold aggressive impulses towards others and to work together with others	Aggression regulation - The ability to withhold aggressive impulses towards others
	Frustration tolerance - The capacity to cope with disappointments and setbacks
	Cooperation - The ability to work constructively with others, to be aware of needs and ideas and others, and to establish mutual goals
	Respect - The capacity to value someone's individual needs and personal identity

Appendix IV: Materials used in the study

[Note: The layout of materials and instruments used in both the preliminary and the main study has been modified (e.g. smaller font, reduced spacing) in order to fit the format of this thesis.]

IV 1: Institutional Review Board - Research Protocol

Researching institutions: School of Health and Related Research (ScHARR), Department of Public Health, The University of Sheffield, UK, South East European Research Centre(SEERC), Greece
*Researcher: **Fivos E. Papamalis***
*Supervisors: **Dr. Efrosini Kalyva, Prof. Petra Meier, Dr Teare Dawn***
Research title: **TREATMENT PROCESS EVALUATION: THE ROLE OF PERSONALITY FUNCTIONING**

Aims & Scope of the Study

This study aims to examine treatment engagement in substance misuse treatment. In an effort to objectively define treatment process, this study aims to bridge the gap in the literature by investigating the relationship among personality characteristics and treatment engagement indicators. In this way, the study will explore the importance of certain aspects of the treatment process, emphasizing certain service users' characteristics that could be used as prognostic indicators of treatment engagement. The purpose of this study is to add to prior research by quantitatively examining the direct and indirect effects, of particular personality dimensions, on the set of defined treatment engagement indicators. Specifically, the study investigates broad and facet level traits as well as (mal) adaptive personality functioning, as potential moderators of treatment engagement.

The importance of the Study

Although empirical evidence indicates the sequential relationship of motivation for treatment with active participation in treatment and the development of therapeutic alliance, few studies have examined these variables simultaneously and not in the context of their association with personality. As these concepts indicate clients' engagement in treatment and represent prognostic indicators of favourable outcome, an overall understanding of the relationship between these process variables and clients' personality dimensions has yet to be formulated. Therefore, one of the main concerns of this study is to fill the gap in the research by integrating previous work regarding personality dimensions and treatment engagement. This integration has important clinical and theoretical implications.

Theoretically, correlation among characteristic adaptations, personality traits and specific engagement indicators would imply a broader conceptual framework in which engagement modifications are viewed in the context of this interaction.
From the clinical perspective, delineating the role of personality traits and (mal) adaptive personality functioning within treatment process could contribute to the identification of individual attrition vulnerabilities and enhance treatment engagement. Practically, this may allow clinicians to identify vulnerable individuals who are less likely to engage in treatment and reformulate treatment planning according to their needs. Findings of the study might add to the development of personality-matching interventions that could be utilised to modify clients' (mal) adaptive personality functioning. The results of this may improve individualized

interventions, identify and modify potential obstacles and enhance treatment response specificity. From the service users' perspective, the study will include their opinion and perception regarding their treatment, which may contribute to the strengthening of active engagement, empowering in this way the individual service user to be an effective agent in the road to recovery.

Engagement will be assessed based on four indicators: i) clients' desirable behavioral contribution to treatment ii) clients' motivational cognitive stages regarding problem recognition, desire for help and treatment readiness, iii) development of trusting relationship between clients and counselors and iv) clients' perception regarding treatment experience.

Study Objectives

- to examine quantitatively the impact of personality characteristics on treatment engagement in the different treatment settings
- to detect and measure possible prognostic indicators that influence treatment engagement and develop a conceptual framework that links and analyses interpretative variables related to treatment process
- to investigate the potential changes of individuals personality dimensions and engagement indicators on the basis of pre-and during treatment measures
- to disseminate the above findings in terms of policy making and clinical field in order to enhance best practice, continuous quality assurance and treatment response specificity
-

Research Questions

According to the above research aims the specific questions that this study attempts to answer are:

1. Are there any significant differences in personality traits and characteristic adaptations between individuals who initiated treatment and those who drop-out during the outpatient preparation phase?
2. Do individuals' characteristic adaptations differ significantly among individuals who are more or less engaged? If so, can we explain variation in the engagement indicators according to the levels of clients' characteristic adaptations?
3. Do individuals' characteristic adaptations differ significantly among individuals who complete treatment and those who drop out? If so, can individuals' overall characteristic adaptations profile be used as a prognostic indicator of treatment completion?
4. Are there any significant changes in the levels of dysfunctional characteristic adaptations between pre- and during-treatment assessment? If so, do these differ according to completion or drop out status?

Participants' selection procedure - Eligibility criteria

The researcher ensures that all the participants will be protected from any uncaused dangers and that their decision to participate in the study is voluntary. The sample will be individuals who enter preparation phase for the intensive inpatient substance misuse treatment (psychosocial rehabilitation and community-based treatment) from the period of Spring 2011-Autumn 2012. Sample size will include approximately160 to 200 participants from both treatment types. The eligibility criteria for the study will be as follows: 1) at least 18 years old, 2) have used illicit drugs during the past 90 days, 3) able to read and speak Greek fluently, 4) no current or previous experience of psychotic symptoms and 5) no severe developmental disabilities or cognitive disturbances. These conditions will be verified on the basis of pre-screen data and information supplied by the treatment providers.

Individuals' previous treatment experiences or additional diagnosis will not be a reason for exclusion. All individuals who are in the preparation phase and fulfil the inclusion criteria will be considered eligible participants of the study. The clinical staff sample will be consisted of counsellors-therapists from all treatment units who work with the service users that have agreed to participate in the study.

Selection of the participants

All service users who are engaged in the preparation phase and fit the inclusion criteria will be invited to participate in the study in both written and verbal manner. All potential participants will be approached individually or in small groups by the researcher in the treatment facilities. Those individuals who agree to discuss the research will receive the related documents including the *Study Information Sheet* and *Informed Consent Form*. Only those individuals who read and sign the *Consent Form* will participate in the study.

Treatment Staff Participation

Treatment staff will be approached in groups or individually by the researcher in the treatment facilities. They will be invited to participate in the study in both verbal and written manner. All treatment staff will receive the Study Information Sheet. Following this written invitation, they will have the opportunity to express any query regarding the research, procedure or their participation. Staff Consent Form will be given to those individuals who express interest to participate.

The Study Information Sheet and the *Consent Form* will contain necessary information regarding the purpose and aims of the study, the expected time of participation in the study and brief description of study procedures. In addition, expected benefits for the individual or treatment, as well as the possibility of certain degree of discomfort will be mentioned. Regarding personal data protection, emphasis will be given to ensure privacy, anonymity and confidentiality. Potential participants will be informed that their participation in the study is voluntary, and that declining to participate or withdraw from the study, will not influence in any way the individual nor the quality of the treatment services they receive. Finally, contact information of the researcher will be provided in case individuals require further information. Moreover, recordswillbesafelykeptina locked cabinet ensuring personal data protection of both participants and organizations. For this reason, all identifying data will be de-identified and coded, removing any personal information that might be used to recognize the participants during the analysis or the publication of the study findings. Moreover, only authorized individuals who are directly involved in data analysis will have access to the records.

Procedure

Baseline data collection from all the participants will adequately describe treatment populations and provide data on clients' overall problem severity. Due to the sensitivity of the initial period in substance misuse treatment, pre-screen data for the potential participants will be gathered from treatment services, including medical data, psychiatrists' notes and the scores on the Treatment Demand Indicator (TDI; EMCDDA, 2000). Intake assessment will be conducted from the first –second week of the preparation phase and will include the administration of the Trait Personality Questionnaire (TPQue; Tsaousis, 2002), the Severity Indices of Personality Problems (SIPP-118; Verheul et al., 2008), and the Client Evaluation of Self and Treatment (CEST; Simpson, 2001; 2005). TPQue administration requires approximately 30 minutes and will be conducted by the researcher and trained volunteers. Upon TPQue completion, self-reports SIPP-118 and CEST will be given to the participants which will last approximately 50 minutes. Even though these forms are self-administered, the assessment team will be present to provide necessary instructions and ensure the appropriate procedure. The administration will be conducted in the treatment facilities after the arrangement with the staff members.

Second assessment battery will be performed between 2nd and 4th week of inpatient treatment, including the same instruments administered in the first phase. The assessment team will conduct TPQue administration in a pre-arranged private location in the treatment facilities. Following TPQue completion, the forms SIPP-118 and CEST will be administered. Moreover, the participants will complete their responses in private after the assessor has left the room, in

order to ensure confidentiality, and avoid desirable responses related to assessor's presence. All the above assessments will be administered in the same order for each participant.

The third phase of administration process will involve staff members, who will be invited to complete both TPQue and specific scales of the Organizational Readiness for Change (ORC; Lehman et al., 2002)[5]. The administration of both questionnaires will take place in a private cabinet in the treatment facilities on a specific day arranged according to staff convenience. On average, completion time for both questionnaires is approximately 50-70 minutes. The researcher will administer TPQue questionnaire during the face-to-face interview with close-ended questions and afterwards staff members will have their privacy to fulfil ORC. In order to ensure confidentiality and avoid desirable responses, staff members will be reassured that their responses will remain strictly confidential and will not be exposed under any circumstances. Στρατολόγηση τ bf-res utf8

The utilization of research results

The study is a part of a PhD thesis by Fivos E. Papamalis at the University of Sheffield, School of Health and Related Research, Department of Public health. Moreover, the results may be presented at scientific conferences and presentations, maintaining the anonymity and confidentiality of all the participants. Any information obtained from the treatment databases will be used only for the purpose and aims of the particular study and in no other case. All data collection processes (interviews, questionnaires) will be performed inside the treatment units. The final results will be provided to the involved treatment organizations and their reference will be made in any publication or statement related to the present study.

Contact for Further Information

In case you need any further clarification or additional information related to the study, or you are interested in discussing the research, you may contact the researcher,

Fivos E. Papamalis
PhD candidate of the University of Sheffield - South East European Research Centre (SEERC),
Proxeniou Koromila 24, 54622, Thessaloniki,
Contact address: Agion Saranda 35, Papagos 15669, Athens Greece
Mobile phone: 6970257820
Study phone: 210 6542513
Email: fpapamalis@seerc.org

In case you decide to participate in the study, please complete the Access Approval Letter that is attached.

Thank you.

[5] The assessment of treatment staff and organizational functioning is not included in this Thesis.

IV 2: Study Info Sheet

[Note: The layout of materials and instruments used in both the preliminary and the main study has been modified (e.g. smaller font, reduced spacing) in order to fit the format of this thesis.]

Researching institutions: School of Health and Related Research (ScHARR), Department of Public Helath, The University of Sheffield, UK, South East European Research Centre (SEERC), Greece
Researcher: ***Fivos E. Papamalis***
Supervisors: ***Dr. Efrosini Kalyva, Prof. Petra Meier, Dr. Dawn Teare***
Research title: **An integrative approach to drug treatment evaluation: Client level factors as indicators of treatment engagement**

Introductory note for the participants

Dear Participant,

Thank you for accepting to read the supplied materials. This material is provided to you as a written invitation to take part in this study related to your therapeutic experience. In order to consider your participation, it is important that you understand the purpose of the study and the procedure that will take place. Please read carefully the following information, and feel free to ask for further clarifications or additional information.

Research background

The aim of this study is to develop understanding of how certain individual characteristics may be related to treatment engagement in substance misuse treatment. More specifically, this study will examine to role of certain personality dimensions in regards to motivation, therapeutic alliance, participation and satisfaction. The study is expected to last for approximately 15 months including around 160 to 200 participants from all treatment facilities.

Your role in the study

After consenting to participate by signing the consent form, you will be given three questionnaires in two phases. Please consider that there are no right or wrong answers, and that your knowledge and experience in the field is of great value for the study. Initially, you will be asked by the researcher to complete these questionnaires that will provide baseline data. They will include personal information regarding your physical and mental health history, alcohol and other drug use history, your perception regarding your personality characteristics and treatment process experience. This process will last approximately 1 to 1, 5 hours. The second administration phase will be performed during your inpatient treatment in a private setting of the treatment facility where you will be asked to repeat the completion of these questionnaires.

Why have you been selected?

You are invited to participate in the study as a service user in public substance misuse treatment facility. All the individuals enrolled in the selected treatment facilities will be invited to consider their participation in this study.

Taking part in the Study

Reading through the *Study Info Sheet* does not in any way oblige you to participate in the study. Your participation in this study is voluntary and you are free to take part or withdraw from the study at any time. If you do decide to participate, you will be asked to sign a *Consent Form* provided to you. It is important to understand that your decision to participate in the study or not will not in any way influence the quantity or quality of the treatment services, the relationship with your counsellor or treatment staff, nor your treatment progress.

Some counsellors are also invited to participate in this study, possibly including your own counsellor. However, your counsellor will not be provided with any information about your responses under any circumstances. Likewise, you will not be informed about any of your counsellor's responses. In order for the researcher to match your responses in conjunction with the responses of your counsellor, it will be necessary to know which counsellor you are seeing. This information will be obtained from treatment staff in charge of your clinical records, and will not be shared with anyone except the researcher.

Risks & Benefits

There is no risk associated with your participation in this study. However, certain degree of discomfort might arise, as some of the questions are very personal in nature, and may require you to provide honest feedback about yourself and your perception and feelings regarding your counsellor, group and treatment services. As a participant in this study, you may benefit from the opportunity to think about your treatment experience and consider how you understand and perceive yourself. This process may also help you to think about your interpersonal relationships and behavioral responses in a given context.

What if something goes wrong?

In case you have a complaint regarding your treatment by any member of the research team, you may contact the research supervisors or your counsellor. If you believe that your complaint has not been adequately addressed, you can contact the University's 'Register and Secretary' and express your concerns.

Confidentiality & Privacy

If you decide to participate in the study, it is important to know that all the information that you reveal during the study will be kept in secure database in a private cabinet with restricted access and with strict confidentiality. Any information that will be used in the study will be anonymous, meaning that all your identifying data and other personal information will be coded. Any report generated from the study will not include any reference to individual participants. That is, your name or any other identifying data will not be publicly disclosed at any time, access to these records will be available only to the researcher and the records will be kept in accordance to current legal requirements.

Nevertheless, confidentiality and privacy may be breached in several legally stipulated cases: a) with your written authorization, b) based on a valid court order, c) in case you reveal some information that might pose an imminent threat to others or your own health, and d) in case of child abuse, or abuse of an elder person. However, study protocol implies that any attempt shall be made in order to resist demands to release identifiable data. All the study related data and any information obtained from the study will be kept for 3 years following the research and will be subsequently destroyed. Finally, non-identifiable scientific data resulting from the study may be published and presented in the scientific community, so that the information can be useful to others.

The utilization of research results

The results of this study will be primarily utilized as a part of a PhD research that will be submitted to the University by the researcher named above. Following the research completion and thesis publication, you will be welcome to read and access research findings.

Who has ethically reviewed the project?

This research has been approved by the Ethics Committee of the City College, affiliated institution of the University of Sheffield, and by the Institutional Review Board of the treatment organizations.

Contact for Further Information

In case you need any further clarification or additional information related to the study, or you are interested in discussing the research, you may contact the researcher,

Fivos E. Papamalis
PhD candidate of the University of Sheffield
South East European Research Centre (SEERC),
Proxeniou Koromila 24, 54622, Thessaloniki,
Contact address: Agion Saranda 35, Papagos 15669, Athens Greece
Mobile phone: 6983386927
Study phone: 210 6542513
Email: fpapamalis@seerc.org

In case you decide to participate in the study, you will be given a copy of the Study Info Sheet and a signed Consent Form.
Thank you.

IV 3: Participant's Consent Form

[Note: The layout of materials and instruments used in both the preliminary and the main study has been modified (e.g. smaller font, reduced spacing) in order to fit the format of this thesis.]

Researching institutions: School of Health and Related Research (ScHARR), Department of Public Health, The University of Sheffield, UK, South East European Research Centre (SEERC), Greece
Researcher: ***Fivos E. Papamalis***
Supervisors: ***Dr. Efrosini Kalyva, Prof. Petra Meier, Dr Dawn Teare***
Research title: An integrative approach to drug treatment evaluation: Client level factors as indicators of treatment engagement

Dear Participant,
Once you have read the Study Information Sheet, you are kindly asked to carefully read and sign this consent form in case you agree to participate. Please return a signed copy to the researcher and keep the same copy for your own records.
By consenting to participate in this study, I understand and confirm that:
1. I voluntarily agree to take part in this study.
2. I have read and understood Study Info Sheet provided to me, which is attached
3. All information given to the above named researcher will be treated as confidential and will not be shared with my counsellors or any other person at the programme. They will be shared only with the project supervisors.
4. I authorise the researcher to disclose the results of my participation in the study but not my name or other personal information about me.
5. I will not be identified in any published material or reports based on this study as all identifiable data will be coded and made anonymous.
6. I also understand that my participation in the study does not promise any therapeutic benefit.
7. If I decline to participate in the study or withdraw later, this will not affect in any way the treatment services that I receive.

Name and surname of participant: _____
Treatment programme: _____
Signature: _____ **Date: _____**

I confirm that I have provided the Study Info Sheet along with verbal explanation of the purpose and study procedures to: (name)_____

Researcher Signature: **Name**: Fivos E. Papamalis

IV 4: Counsellor's Consent Form

Researching institutions: School of Health and Related Research (ScHARR), Department of Public Health, The University of Sheffield, UK, South East European Research Centre (SEERC), Greece

Researcher: ***Fivos E. Papamalis***

Supervisors: ***Dr. Efrosini Kalyva, Dr. Petra Meier***

Research title: An integrative approach to drug treatment evaluation: Client level factors as indicators of treatment engagement

Dear Participant,
Once you have read the Study Information Sheet, you are kindly asked to carefully read and sign this consent form in case you agree to participate. Please return a signed copy to the researcher and keep the same copy for your own records.
By consenting to participate in this study, I understand and confirm that:
1. I voluntarily agree to take part in this study.
2. I have read and understood the Study Info Sheet provided to me, which is attached
3. All information given to the above named researcher will be treated as confidential and will not be shared with my clients or any other person at the programme. They will be shared only with the project supervisors.
4. I authorise the researcher to disclose the results of my participation in the study but not my name or other personal information about me.
5. I will not be identified in any published material or reports based on this study as all identifiable data will be coded and made anonymous.
6. I also understand that my participation in the study is not an evaluation of my job performance.
7. If I decline to participate in the study or withdraw later, this will not affect in any way my work in this organisation or the services that I provide.

Name and surname of counsellor: _____
Treatment programme: _____
Contact number/e-mail: **_____**
Signature: _____ **Date: _____**

I confirm that I have provided the Study Info Sheet along with verbal explanation of the purpose and study procedures to: (name)_____

Researcher's Signature **Name**: Fivos E. Papamalis

Appendix V: Assessment tools used in the Study

(see overleaf for data collection forms)