The Chicken or the Egg:

Exploring Prediction Models for Dysfunctional Schemas, Mental Distress and Wellbeing by Backward Elimination

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Master Thesis Psychology

December 2016, Enschede (Netherlands)

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Abstract

Objective: Regarding the expensive and complex treatment of personality disorders, this study aims to explore various models in predicting dysfunctional schema domains, mental distress, and wellbeing. In today's' health care system, assumptions are often made throughout a clinical recovery approach, which assess one's level of symptoms first to predict one's post-treatment level of wellbeing. Another approach is the personal recovery approach, which makes its predictions the other way around. Determining a precise prediction model for these variables might indicate that revision could optimize the recovery approach used by today's' health care system. **Methods**: It is explored which of the possible predictor variables forge the most promising prediction model. The current study is a within-subjects design including a quantitative naturalistic pre-post study with two measurements taken approximately 12 months apart. Questionnaires were filled in both times by men and women (aged 18-44) who are currently or were recently voluntarily subjected to clinical schema-focused group psychotherapy. The criteria (i.e. dysfunctional schema domains, mental distress, and wellbeing (emotional, social, and psychological)) as well as the predictor variables (i.e. age, sex, comorbidity, disconnection and rejection, impaired autonomy and performance, impaired limits, other-directedness, over-vigilance, dysfunctional schema domains total, mental distress, and wellbeing (emotional, social, psychological, and overall)) are selected by correlational analyses. Next, these variables were entered into backward elimination models, leading to two models linked to the different recovery approaches (clinical and personal). **Results**: Analyses determined two significant prediction models. On the one hand, the model regarding the clinical recovery approach explained up to 8% of variance in the level of wellbeing, with other-directedness (35%, $\beta = .59$, $p < .05$) as significant predictor and dysfunctional schema domains (19%, $\beta = -.43$, $p > .05$), and impaired limits (5%, $\beta = .23$, $p > .05$) as trending predictors. On the other hand, the model regarding the personal recovery approach explained up to 15% of the variance in the level of symptoms, with social wellbeing (27%, $\beta = .52$, $p < .01$) as significant predictor and comorbidity (2%, $\beta = .13$, $p > .05$) and wellbeing total (3%, $\beta = -.18$, $p > .05$) as trending predictors. Furthermore, common factors in both approaches are predictor variables regarding social aspects, explaining between 14% (social wellbeing) and 35% (other-directedness) of the variation in treatment outcomes. **Discussion**: In conclusion, it is suggested that the prediction model regarding predicting the level of symptoms by the level of wellbeing - linked to the personal recovery approach - to be the better approach in today's' health care system, because this models predicting value is twice as high compared to the clinical recovery prediction model. Also, due to the mutual impact of variables with a social background in both models, it is recommended to examine social aspects as predictor variables in further research.

Keywords: recovery approach, wellbeing, mental distress, mental health, schema-focused therapy, dysfunctional schema domain, backward elimination, prediction model, personality disorder

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Samenvatting

Doelstelling: Het doel van dit onderzoek is om verschillende modellen te verkennen die disfunctionele schemadomeinen, mentale stress en welbevinden kunnen voorspellen binnen de dure en complexe behandeling van persoonlijkheidsstoornissen. In het huidige zorgsysteem worden vaak aannames gedaan op basis van een klinische herstel benadering, die eerst de mate meet waarin bepaalde klachten bij een cliënt voorkomen zodat het welbevinden na de behandeling kan worden voorspeld. Een andere benadering is de persoonlijke herstel benadering, die voorspellingen andersom maakt. Het bepalen van een nauwkeurig voorspellersmodel zou kunnen impliceren dat een optimalisering binnen het zorgsysteem mogelijk is. **Methode**: De mogelijke predictoren zijn onderzocht om het meest voorspellende model te vormen. Dit onderzoek is uitgevoerd in een within-subjects design als kwantitatief naturalistisch pre-post onderzoek met twee meetmomenten met ongeveer 12 maanden tussentijd. Beide keren hebben mannen en vrouwen (leeftijd 18-44) de vragenlijsten ingevuld. Zij nemen of namen recent vrijwillig deel aan klinische schemagerichte groepspsychotherapie. Zowel de criteria (*dysfunctional schema domains, mental distress, and wellbeing (emotional, social, and psychological)*) als de predictoren (*age, sex, comorbidity, disconnection and rejection, impaired autonomy and performance, impaired limits, other-directedness, over-vigilance, dysfunctional schema domains total, mental distress, and wellbeing (emotional, social, psychological, and overall)*) zijn geselecteerd door correlationele analysen. Vervolgens zijn deze variabelen ingevoerd in "backward elimination" modellen, waardoor twee modellen tot stand zijn gekomen die gelinkt kunnen worden aan de verschillende herstel bernaderingen (klinisch en persoonlijk). **Resultaten**: De analyses hebben twee significante voorspellersmodellen tot stand gebracht. Het model met betrekking tot de klinische herstelbenadering verklaart 8% van de variatie in welbevinden. Hierbij is de variabele *other-directedness* (35%, ß = 0,59, p <0,05) de significante voorspeller, en zijn *dysfunctional schema domains* (19%, ß = -.43, p> 0,05) en *impaired limits* (5%, ß = 0,23, p> 0,05) de voorspellende trends. Daarnaast verklaart het model met betrekking tot de persoonlijke herstelbenadering 15% van de variatie in de mate waarin bepaalde klachten bij een cliënt voorkomen. Hierbij is de variabele *social wellbeing* (27%, ß = 0,52, p <0,01) de significante voorspeller, en zijn *comorbidity* (2% , ß = 0,13, p> 0,05) en *wellbeing total* (3%, ß = -.18, p> 0,05) de voorspellende trends. De modellen bevatten gemeenschappelijke factoren die tussen de 14% (*social wellbeing*) en 35% (*other-directedness*) verklaren van de variatie in behandelresultaten. **Discussie**: Men kan concluderen dat het model omtrent het voorspellen van het niveau van klachten door iemands welbevinden de betere aanpak is. Dit model is gelinkt aan de persoonlijke herstelbenadering en bevat ongeveer twee maal zo veel voorspellende waarde als het model voor de klinische benadering. Verder blijkt dat variabelen met een sociale context in beide modellen een grote impact hebben op de voorspelling. Daarom is het raadzaam om sociale aspecten als mogelijke predictoren verder te gaan onderzoeken.

Preface

Before you lies the thesis "The Chicken or the Egg: Exploring Prediction Models for Dysfunctional Schemas, Mental Distress and Wellbeing by Backward Elimination", the result of an investigation of two models which predict one's status of mental health after attending clinical schema-focused group psychotherapy, by using the current status of mental health as a predictor variable. This thesis has been written to fulfill the graduation requirements of the Master's program Positive Psychology and Technologie at the University of Twente (UT) in the Netherlands. Between February and December 2016, I was engaged in researching and writing this thesis. The research was done at a mental health care facility for personality disorders, where I undertook an internship.

Acknowledgements

I would like to thank all involved people for their cooperation during my thesis project. This thesis would not have been possible without their kind support and critical thinking.

First of all, I would like to express my sincere gratitude to all clients of 'De Wieke' (Mediant, Centrum Voor Persoonlijkheidsstoornissen). Without their participation, I would not have been able to conduct this research. Let me also express my gratitude to my (former) colleagues of this facility for the opportunity of my internship and the herewith linked thesis project. Thank you for your time and effort which helped me out with this research project.

I am grateful to my supervisors for their involvement, and constructive feedback. Throughout my research process, their personal guidance inspired me to always think one step further.

Last but not least, I want to express my heartfelt thanks to my friends and family, who are a major support during my study and beyond. I also benefitted and enjoyed from debating the projects issues with them. If I ever lost interest during difficult times, they all kept me motivated. My partner deserves a particular note of thanks: your wise counsel and kind words have, as always, served me well.

I hope you enjoy your reading.

Julie Catherine Sentis

Nijmegen, December 2016

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Introduction

Our health care system utilized nowadays, has over the years, undergone several methodological and practical improvements to become the working system it is today. The key element of any improvement is a process of change, in which several factors play a crucial role: examining different quality improving approaches, integration of evidence-based medicine and techniques, and simplifying the methodology (Massoud, Askov, Reinke, Franco, Bornstein, Knebel & MacAlay, 2001). In this paper, two different recovery approaches are examined in order to improve the health care systems quality eventually by innovation in its use and application.

In the 1980's a series of studies have been introducing the term recovery into the health care system. Since then, the concept of recovery-oriented health care services has grown. As Jacobson (2003) stated, the course of mental illness is not always one of inevitable aggravation and clients diagnosed with (several) mental illnesses could recover to a certain degree, if treated effectively. Recent research indicated that many forms of therapy which is used nowadays is effective in treating symptoms of several clinical problems and disorders (Henggeler, 1999). Further, the dodo-bird verdict is a common phenomenon which states that it is not of importance which therapy is used to treat a client because the different therapies will approximately have the same outcome (Luborsky et al., 2002). Hence, it might be concluded that there is nothing wrong with the content of therapy the health care system provides for different mental health problems. If the therapy itself isn't the problem, one might further look at how treatment plans are organized and executed within the recovery-oriented health care system.

Moreover, the dodo-bird verdict does usually not consider or imply the order in which treatment must be provided. To further investigate this problem, two different recovery approaches are described and discussed throughout this paper. Todays' health care system operates through a recovery approach that is seen as the traditional approach: the clinical recovery approach. In this approach, clients are primarily provided with symptom reducing interventions. If ones' symptoms are significantly reduced, the client is secondarily given interventions that focus on promoting ones' wellbeing (Slade, 2010). This recovery approach might be linked to the more classic psychology with effective therapies such as cognitive-behavioral therapy (Butler, Chapman, Forman & Beck, 2006).

Over the years, different approaches have been developed alongside the clinical recovery approach, for example, a more modern recovery approach: the personal recovery

approach. In this approach, clients are primarily provided with wellbeing promoting interventions. Secondarily, clients are provided with symptom reducing interventions (Slade, 2009). This recovery approach might be linked to a more modern perspective of the positive psychology. Also, the personal recovery approach might be associated with effective treatments such as the compassion-focused therapy (Lucre, & Corten, 2012).

Because of the dodo-bird verdict, it seems that recent literature about this subject cannot give an unambiguous indication about which approach should be applied in today's' health care system to provide clients with most treatment benefits possible. This question remains because it is yet unclear which subject one should attend to first in therapy: a clients' symptoms or wellbeing. Therefore, it might be implicated that therapy could be more effective due to the organizational character of the therapy approach used. To further explore this subject, several prediction models will be discussed in this paper. These prediction models aim to give more information about whether the level of wellbeing can be better predicted by ones' level of symptoms or whether the level of ones' symptoms can be predicted better by the level of ones' wellbeing. In the first case, the clinical recovery approach would seem more suitable, because decreased symptoms could lead to increased wellbeing. In the second case, the personal recovery approach would seem more fitting, because an increase in wellbeing could result in a decrease in the level of one's symptoms. By assessing the prediction model with the greatest predictive value, this paper aims to explore which recovery approach (clinical or personal) has the best fit for clients diagnosed with a personality disorder (PD) and might give an indication about which recovery approach should be applied in today's' health care system.

There is a major concern regarding people with personality disorders and problems they have in several life domains as a result of their mental disorder. More specifically, people with personality disorders experience a high level of psychological distress in general as well as a low quality of life (Cramer, Torgersen & Kringlen, 2006), which makes them less productive in daily life situations (Soeteman, Hakkaart-van Roijen, Verhuel & Van Busschbach, 2008). Furthermore, treating clients with personality disorders is complex and results in high economic costs for the healthcare sector, because long-term treatment often is needed for these patients (Houston, Mainous & Schilling, 1996; Soeteman et al., 2008). In line with findings by Schaap, Chakhsssi & Westerhof (2016), effective treatment for adults with personality disorders can significantly decrease symptoms of psychological distress and increase the level of wellbeing. In addition, the healthcare consumption per client reduces, which in turn leads to fewer economic costs.

One form of effective treatment for clients with personality disorders is the schema-focused therapy (SFT), which uses behavioral, cognitive and experiential interventions (Young, Klosko & Weishaar, 2003). Prior to this study, several other studies have investigated the effectiveness of SFT for clients diagnosed with personality disorders (Diagnostic and Statistical Manual of Mental Disorders [DSM], 2000). This form of treatment is mostly researched in out-patient and individual treatment settings (Van Asselt, Dirksen, Arntz, Giesen-Bloo & Seversens, 2009). Due to the complexity of the clients' problems, which emerge in different life domains, there is a great number of clients who could benefit more from intensified forms of treatment, such as clinical individual and group psychotherapy (Muste, 2012). Therefore, more research about this clinical therapy setting seems needed.

This study aims to give more insights about this particular target group by investigating which dysfunctional schema domains clients are subject to and how treatment outcomes on these active dysfunctional schema domains, experienced mental distress, and level of emotional, social and psychological wellbeing might be predicted by various potential predictors, such as comorbidity and wellbeing. Thus, assessing the prediction model with the greatest predictive value explores which recovery approach (clinical or personal) has the greatest fit for clients diagnosed with a PD and might give an indication about which recovery approach should be applied in today's' health care system.

Two distinct approaches: clinical recovery versus personal recovery

In the following paragraph, two recovery approaches are discussed further.

Clinical recovery approach

Looking at the subject of recovery, based on the traditional view of psychology, the clinical recovery approach comes to mind. Within this approach, abovementioned SFT is a common form of therapy to treat clients with PDs in different healthcare settings (Bamelis et al., 2014). Also, as suggested by Lunding and Hoffart (2016), dysfunctional schema and schema domain scores at pre-treatment can be used as an outcome to predict post-treatment scores. Results of their study show that the schema domain scores at the beginning of the treatment predicted outcomes on the changes in personality at the end of the treatment. Also, in the study by Lunding and Hoffart (2016), every schema domain predicted different aspects of personality traits. Hence, it seems necessary for today's study to explore the five schema domains.

Another form of an outcome measure is the Brief System Inventory, which measures psychological symptoms of distress (BSI; Piersma, Reaume & Boes, 1994). Jacobson et al. (1984) and Piersma and colleagues (1994) suggested using the total score of the BSI as an instrument for retrospective analyses by linking it with demographics and treatment variables as an attempt to determine predictors of treatment success or failure. Also, its predictive validity was established for a wide variety of in- and out-patient groups (Holden, Starzyk, McLeod & Edwards, 2000). For example, a study by Sümer and Sümer (2007) used the BSI at pre-measure to predict mental health at post-measurement in the military context, where personality traits are widely researched. In clients with PDs, the focus of the clinical recovery approach lies on the high level of psychological distress, which results in low quality of life and in turn leads to more distress. This downward spiral makes clients less productive in daily life situations (Cramer, Torgersen & Kringlen, 2006).

In the healthcare sector, therapy focused on the clinical recovery approach is seen as the traditional approach in treating problems regarding a person's health. This approach focuses on the importance of symptomatology, risk management and relapse prevention (Slade, 2010). In line with findings of Bamelis and colleagues (2014) about raising overall functioning in clients with PDs by SFT and in line with findings of Cramer and colleagues (2006) about the effect psychological distress has on wellbeing, it is hypothesized that schemas domains and symptoms of mental distress at baseline predict the level of emotional, psychological and social wellbeing clients report after the treatment.

Personal recovery approach

Looking at theee subject of recovery, based on the positive psychology, the personal recovery approach comes to mind. This approach aims at increasing one's emotional, social and psychological wellbeing. Emotional wellbeing consists of several dimensions such as satisfaction in life and the frequency of positive affect. Social wellbeing consists of dimensions such as acceptance of others and a sense of social contribution. Psychological wellbeing consists of dimensions such as self-acceptance and positive relations with others (Keyes, 1998). Since it is known that a higher state of wellbeing can affect psychological distress and personality (Ruini, Ottolini, Rafanelli, Tossani & Fava, 2003), the subject of wellbeing is of importance to this study.

The personal recovery approach can be used as an intervention that focuses on stimulating one's wellbeing in a multidimensional model which helps clients to prevent relapses and to overcome mood- and anxiety disorders by learning more about personal

recovery (Fava, 1999). An often-used instrument to measure wellbeing is the Mental Health Continuum-Short Form (MHC-SF). It also can be used to predict treatment outcomes in terms of mental health and mental illness (Capone, Caso & Keyes, 2015). For example, a study by Ruini (2014) shows that focusing on promoting one's wellbeing, by increasing daily functioning, can in return reduce sources of mental distress, such as effects of post-traumatic stress disorders.

In the healthcare sector, therapy focused on the personal recovery approach is seen as the modern approach to treat problems regarding a person's health. This approach focuses on the importance of one's wellbeing and recovery from health problems by promoting one's status of mental health (Slade, 2010). In line with findings of Ruini (2003) about the effect, wellbeing has on psychological distress and personality; it is hypothesized that the level of emotional, social and psychological wellbeing at baseline predict the number of dysfunctional schemas and symptoms of mental distress a client reports after the treatment.

The two continua model

Today, schema-focused psychotherapy is a common form of treatment for clients with personality disorders. Within this concept, dysfunctional schemas are in the therapist's center of attention and are, as earlier mentioned, suggested to be the key to a reduction of a client's symptoms. Not only the presence of mental distress, or dysfunctional schemas, but also the absence of wellbeing could be an important factor in treating personality disorders, as suggested by Slade (2010). That is why the ongoing discussion about the two continua model plays an important role in today's academic research and development of interventions.

According to Westerhof and Keyes (2009), the two continua model states that mental illness and mental health are two distinct dimensions. Furthermore, they state that these two dimensions are at the same time related to one another. A study by Westerhof and his colleague (2009) about the two continua model revealed that some factors are related to mental health (e.g. sex) and other factors are linked to mental illness (e.g. having physical problems). This raises the question how these two dimensions are taken into account in today's' health care system.

The purpose of this study is to explore which recovery approach (clinical or personal) is more suitable in today's' health care setting, more specifically on the example of clients with personality disorders treated in a clinical group psychotherapy setting. In addition, it will be explored which other predictive factors have the greatest predictive value and should be further examined to assess its influence on the choice of recovery approach. Thus, this study

attempts to provide an indication of the effective use of clinical schema-focused group psychotherapy, when taking these client characteristics into account. This question by itself can be considered ambiguous because the answer is depending on many factors, which will be further explained below. Therefore, exploring various prediction models in the setting of long-term group SFT in a naturalistic clinical group psychotherapy setting seems needed throughout both perspectives: clinical recovery and personal recovery approaches.

Personality disorders (PD)

Past research indicates that approximately 12% of the Dutch population is diagnosed with a PD (Zimmerman, Rotschild & Chelminski, 2005). In the diagnostic and statistical manual of mental disorders (DSM-IV-TR), it is assumed that impairments in self- and interpersonal functioning, as well as the presence of pathological personality traits, are crucial aspects of PDs (DSM, 2000). Furthermore, PDs are referring to a rigid and pervasive pattern of personality aspects that differ from prevailing cultural norms in terms of pathologic dysfunction, which are relatively persistent over time (First, Gibbon, Williams & Benjamin, 1997). In society, they are seen as dysfunctional patterns of behavior (Van Velzen, & Emmelkamp, 1996). Within areas of affect, behavior, cognition, inner experience, interpersonal functioning and impulse control, patterns of PDs result in significant personal and functional limitations in different life domains, such as work and interpersonal relationships (Berrios, 1993). The DSM assumes that these maladaptive and enduring patterns are developed due to a combination of genetic factors and environmental influences such as traumatic life events (Millon, & Roger, 1996).

Typically, PDs are distinguished between eleven different types. The DSM-IV-TR (2000) divides these types into the following three clusters. First, cluster A: the strange, eccentric cluster. This cluster contains the paranoid, schizoid and schizotypal PDs. Second, cluster B: the dramatic, emotional, impulsive cluster. The PDs of this cluster are theatrical, borderline, narcissistic and antisocial. Third, cluster C: the anxious cluster. Within this cluster, it is differentiated between the avoidant, dependent and obsessive-compulsive PDs. Furthermore, there are PDs which do not comply with any of the classified clusters above. These PDs form a fourth cluster, namely the personality disorder not otherwise specified (PD-NOS; APA, 2000). Because cluster A is not treated within the same health care facility where this study was conducted, merely cluster B, C, and PD-NOS are relevant for this study; thus, cluster A is not further discussed in today's paper.

Impact of personality disorders

People with a PD suffer from many physical and mental limitations due to their mental disorder. The negative consequences of suffering from a PD occur in forms of limitations in psychological, social and work-related functioning (Chen, Cohen, Kasen & Johnson, 2005). For example, a study by Van Asselt et al. (2009) shows that people diagnosed with a borderline PD tend to harm themselves more often and experience more depressive feelings as well as more episodes of anxiety and anger. Besides depression and anxiety, there are many more problems which can occur when suffering from a PD, for instance, interaction problems with other people and comorbidity (Millon, Millon, Meagher, Grossman & Ramnath, 2000). Comorbidity is defined as the coexistence of multiple (chronic) diseases (Rice, & LaPlante, 1992).

In PDs, comorbidity with other mental disorders is a common phenomenon (Miller, Campbel & Pilkonis, 2007). Furthermore, Miller et al. (2007) showed that people with a cluster C personality disorder experience high comorbidity with anxiety disorders. These results are in accordance with results of other studies about PDs and its comorbidity (e.g., Friorg, Martinussen, Kaiser, Øvergård, & Rosenvinge, 2012; Lenyenweger, Lane, Loranger & Kessler, 2007). In general, people diagnosed with multiple comorbid disorders tend to experience more psychological distress and a lower quality of life due to their symptoms. This phenomenon also occurs in individuals with PDs of every cluster (Nakao, Gunderson, Phillips, Tanaka, Yorifuji, Takaishi & Nishimura, 1992). These and other disorder induced problems are likely to result in higher consumptions of healthcare services, a smaller chance of (full) recovery and also increased costs for the health care sector (e.g., Oldham, & Skodol, 1995; Soeteman, Hakkaart-van Roijen, Verheul & Van Busschbach, 2008). Because of the great impact, a PD has on an individual, utilization of the best-fitted recovery approach determined by proper predictions of treatment outcomes is needed in order to provide clients with effective treatment eventually.

Schema-focused therapy (SFT)

One form of an effective therapy that is being used in the treatment for PDs is SFT (Schaap, Chakhssi & Westerhof, 2016). This was initially developed in 1990 by Jeffrey Young as an individual therapy for treating PDs, chronic depression and other severe individual and couples' problems in patients within a policlinic setting (Young, 1990). According to Young, dysfunctional schemas are the underlying problem of personality pathology (Kellogg, & Young, 2008). Schemas are defined as "broad, pervasive themes

regarding oneself and one's relationship with others" (Young et al., 2005). They are developed during childhood and elaborated throughout one's lifetime, in which the combination of a child's temperament and the ongoing experiences with their parents, siblings, and peers have the formation of functional and dysfunctional schemas as an inevitable result (Young, 1990).

Within this study, functional schemas are not further examined, because dysfunctional schemas are considered a core element of personality disorders (Lobbestael, van Vreeswijk & Arntz, 2008). A schema is called dysfunctional when the activation of a certain schema has, due to certain thoughts, beliefs and reaction patterns, negative or undesirable effects on a particular situation and the general functioning of a person (Young et al., 2005). Schemas, in general, are activated by daily life situations and interactions with others, in which they are observable in the form of core patterns of behavior that a person tends to use throughout his or her life repeatedly. These dysfunctional patterns are a reflection of one's unfulfilled basic emotional needs and result in undesirable effects on the situation of one's self-perception (Young et al., 2005). Until today, five Schema Domains with a total of eighteen different dysfunctional schemas have been identified and listed in Table 1, an overview of Schema Domains and dysfunctional schemas (Young et al., 2003).

Table 1. *Overview of Schema Domains, dysfunctional schemas*

Schema Domain	Dysfunctional schema
Disconnection and Rejection Expectation that basic emotional needs will not be met	01. Abandonment/ instability 02. Emotional deprivation 03. Defectiveness/ shame 04. Mistrust/ abuse 05. Social Isolation/ alienation
Impaired Autonomy and Performance Problems with independence and self-confidence	06. Dependence/ incompetence 07. Enmeshment/ undeveloped self 08. Failure 09. Vulnerability to harm or illness
Impaired Limits Desire for superiority, lack of impulse control	10. Entitlement/ grandiosity 11. Insufficient self-control/ discipline
Other-Directedness Focus on the needs of others at the cost of one's own wellbeing	12. Approval Seeking 13. Self-Sacrifice 14. Subjugation
Over-vigilance and Inhibition Suppression of emotions, rigid rules, focus on negative experiences	15. Emotional Inhibition 16. Negativity/ Pessimism 17. Punitiveness 18. Unrelenting standards/ hypercritical

Notes: Adapted from: Eurelings-Bontekoe, Luyten, Ijssennagger, Van Vreeswijk & Koelen, 2010.

Impact of schema-focused therapy

Prior to this study, several other studies listed below have evaluated the effectiveness of SFT in policlinic and clinical settings regarding clients with PDs. Schema-focused therapy, as developed by Young, is being used among other forms of therapy to treat clients with PDs in policlinic and clinic settings with an individual and group therapy approach (Muste, & Claassen, 2009; Schaap et al., 2016). Research shows that SFT has positive effects on different aspects of PDs (Sempertegui, Karreman, Arntz & Bekker, 2013; Van Vreeswijk, Nadort & Broersen, 2008). In a study by Bamelis, Evers, Spinhoven and Arntz (2014), SFT significantly outperformed other forms of psychotherapy, e.g. treatment as usual and clarification-oriented psychotherapy. Further, social, occupational, and overall functioning as well as wellbeing did increase in the SFT group and maintained at three years' follow-up.

Over time, a different form of SFT has been developed from this individual psychotherapy approach, namely the group psychotherapy for treating PDs in a clinical setting (Thunnissen, & Muste, 2005). Abovementioned studies mainly investigated the effects of SFT in ambulant settings and individual therapy. However, part of the clients with PDs would benefit more by being treated in a clinical setting rather than a polyclinic or daycare setting, because for the complexity of their problems more intense treatment is needed (Vreeswijk et al., 2008). In these psychotherapy SFT group sessions, clients are able to identify themselves with the scenarios of other clients (Muste, 2012), which in turn can lead to more insights about one's dysfunctional schemas, behavioral intentions and emotional needs (Schaap et al., 2016).

Common client characteristics and other influencing factors

Besides the presence of dysfunctional schemas and symptoms of psychological distress, other factors like common client characteristics might influence the effectivity of schema-focused therapy in a clinical group psychotherapy setting. A person's demographics are usually seen as stable socioeconomic factors, for example, ones' sex and age. When comparing groups with different demographic factors with each other, Perrewé, Halbesleben and Rose (2014) found that demographics seem to influence one's level of distress and ones' level of wellbeing.

Not only demographics can be used in predicting treatment outcomes to a certain degree. Also, as pointed out earlier in this study, it is common for clients with PDs to be diagnosed with at least one comorbid disorder on Axis I or Axis II, which in turn can lead to an increased level of mental distress and a decreased status of wellbeing (e.g. Nakao et al., 1992; Friorg et al., 2012). In this study, the primary personality disorder diagnosis and the secondary comorbid diagnoses are seen as other possible influencing client characteristic, which could impact the prediction of outcomes of wellbeing (emotional, psychological, social), Schema Domains and symptoms of mental distress clients report after the treatment.

Impact of common client characteristics and other influencing factors

People personally affected by mental illness often experience limitations in different life domains and report lower levels of wellbeing. Often clients are diagnosed with more than one mental disorder. A study by Arntz (2001) describes that comorbidity in clients diagnosed with PD is no rarity. These clients often begin with treatments focused on mood- and anxiety disorders. Bender et al. (2001) supports these findings and adds that these clients are characterized by a diverse history of prior therapy. Not only might these factors have an

impact on the effectiveness of clinical schema-focused group psychotherapy, but also other client characteristics can play an important role. Gender differences are for example stated as one of the main factors that influence the prevalence of dysfunctional schemas (Rijkeboer, & Van den Bergh, 2006).

When making predictions about outcomes of wellbeing (Emotional, social, and psychological), dysfunctional schema domains and symptoms of mental distress clients report after the treatment, taking common client characteristics into account is of importance for this study. It is hypothesized that there is a link between, on the one hand, mental distress, dysfunctional schema domains, wellbeing, and common client characteristics such as comorbidity, and on the contrary a high number of dysfunctional schemas, high level of psychological distress and a low level of emotional, social and psychological wellbeing, which allows one to make prediction about treatment outcomes.

Research Question

The explorative research question of this paper is as follows:

"When using prediction models to explore different predictor variables, such as comorbidity, mental distress and wellbeing, which prediction model is more suitable for clients with personality disorders in a clinical group psychotherapy setting: a clinical recovery approach that predicts emotional, social and psychological wellbeing from mental distress or dysfunctional schema domains versus a personal recovery approach which makes its predictions vice versa?"

Or in other words:

"What comes first: The chicken or the egg?"

To answer this question the following two sub-questions will be answered, in which the word "clients" refers to clients as described in the abovementioned main question of this study:

- I) To which extent do dysfunctional schema domains and symptoms of mental distress at baseline (T1) predict the level of emotional, social and psychological wellbeing clients report after completing the treatment (T3)?

- II) To which extent does the level of emotional. Social and psychological wellbeing at baseline (T1) predict dysfunctional schema domains and symptoms of mental distress clients report after completing the treatment (T3)?

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Method

Research design

The current study was a within-subjects design including a quantitative naturalistic pre-post study with four measurements, each taken six months apart. In this study, the following terms were used to describe the measurement that was taken: pre-treatment (T1), mid-treatment (T2), end-treatment (T3) and post-treatment (T4). For this study's research question, measurement T2 and T4 are not of importance, because this study examines predictions of T3 made by information gathered at T1. More specific, the data of today's' study was collected in order to establish different prediction models by exploring the predictors' data at pre-treatment (T1) and by exploring the criteria data after completing the treatment (T3) within the following set of criterion variables: reported (a) dysfunctional schema domains at T3, (b) symptoms of mental distress at T3 and (c) client's wellbeing after completing the therapy (T3; respectively emotional, social and psychological). Further, the impact of overall client characteristics (respectively age, sex and comorbidity) and other possible predictors (T1; respectively dysfunctional schema domains, mental distress, emotional, social and psychological wellbeing), were taken into account when predicting abovementioned parameters.

The data was collected from clients diagnosed with a PD cluster B, C or personality disorder not otherwise specified (PD-NOS; APA, 2000), who voluntarily stayed in clinical schema-focused group psychotherapy treatment setting between the years 2011 – 2016 for a maximum of 12 consecutive months. Due to the circumstances of the naturalistic clinical research setting, the design does not include a control group. Further, this study's design, sampling method, chosen materials, and other parameters are predetermined, since today's study was a part of a bigger study by Schaap and colleagues (2016). Todays' study used and further complemented data of that prior designed study by Schaap et al. (2016), who measured the effectiveness of SFT in clients with a PD. In line with the study by Schaap et al. (2016), therapy was given, and data was collected on the basis of the clinical recovery approach.

Participant characteristics

This study's participants are clients of a center for personality disorders ('Centrum voor Persoonlijkheidsstoornissen' (CvP), Mediant GGZ), a regional mental health care center in Hengelo, the Netherlands. This healthcare center consists of three departments: policlinic

(for outpatients), daycare ('De Bremmele') and clinical care ('De Wieke'). Within this center, 'De Wieke' is specialized in working with group SFT and provides clients with clinical therapy for up to 12 months (+- 3 months). All data for this study is collected within this institution and client setting. 'De Wieke' is based on promoting a stagnated development of one's personality within a group psychotherapeutic setting. The goal of this schema-focused approach is to improve the functioning of clients within problematic life domains.

This study's participants are a total of 155 clients of 'De Wieke' ($n = 36$ men and $n = 119$ women, aged 18-44 years) which received clinical group schema-focused psychotherapy, between 2011 and 2016, as a treatment for PD cluster B, C, and PD-NOS. Every participant filled in and submitted the informed consent form so that their data could be used anonymously for the purpose of the research conducted by Mediant CvP, including this study and aforementioned research was done by Schaap (2016). Participants were free to decide which measurement they wanted to attend to, therefore not every participant filled in every survey. Consequently, the number of participants differs between questionnaires and the two points of time (T1, T3) due to missing data and drop-out. For detailed information about the number of participants see the figure below (Figure 1. Flowchart). In this study, drop-outs are seen as clients who stopped to attend therapy at least three months early and are consequently excluded as participants for this study. Further, missing data is considered an incomplete questionnaire, which also did exclude clients from further participation in this study.

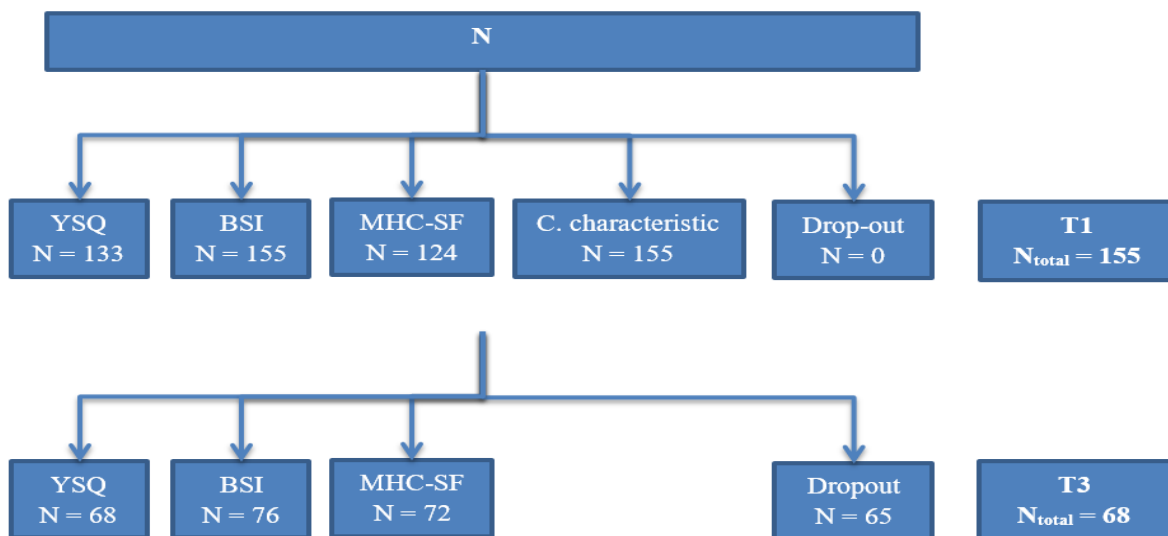*Figure 1*: Flowchart. Illustrating the number of clients which participated in the study at a given point of time. A total number of $N = 68$ qualified for the statistical analyses of this paper by attending therapy and completely filling in all questionnaires.
Note: The discrepancy between the listed N of a given variable and $N_{drop-out}$ is explained by missing data due to non-responsive clients or incomplete questionnaires.

Inclusion criteria

Every participant in this study met the following four inclusion criteria: a minimum age of approximately 18 years, being diagnosed with a DSM-IV-TR Axis II PD cluster B, C or PD-NOS, is able to speak and read the Dutch language and has signed the informed consent form. Further, clients must have attended approximately 12 months of SFT within the 'De Wieke', more specifically a minimum of 9 months and a maximum of 15 months.

Exclusion criteria

Participants who met at least one of the following criteria are excluded from this study: younger than approximately 18 years of age, not signed the informed consent form, a diagnosis of a DSM-IV-TR Axis II PD cluster A or no diagnosis of a PD at all. Further, dropping out of the therapy early leads to exclusion as a participant of this study.

Sampling procedure

This study consisted of pre-treatment (T1), mid-treatment (T2), end-treatment (T3) and follow-up (T4). Each measurement is taken six months apart. First, participants receive an information brochure (Appendix A) about the study. During the first intake, orientation meeting, clients are approached and asked to participate in this study. Then, participants sign the informed consent (Appendix B) form and make an appointment for the baseline measurement T1 survey, which serves the purpose of data collection for this study. Second, six months after beginning the treatment participants are asked to fill in the intermediate survey at T2. Third, twelve months after beginning the treatment participants fill in the final survey at T3. This is also the moment in which participants completed the treatment at the health care clinic (approximately +- 3month). Finally, six months after a participant's discharge from the clinic, participants are asked to fill in the follow-up survey at T4. Every measurement is supervised by an approved psychologist, approved psychotherapist or a psychologist in training.

Measures and covariates

Young Schema Questionnaire (YSQ)*:* Clients functional and dysfunctional schemas are identified by the Young Schema Questionnaire (YSQ; Young, 1994; Dutch version: Sterk, & Rijkeboer, 1997). As earlier mentioned, only dysfunctional schemas are of importance to this study. This is a self-report questionnaire with 232 items often used in

clinical settings. Answers on each item are possible on a 6-point scale from "completely untrue of me" (1) to "describes me perfectly" (6). The total score of every Schema Domain is calculated by adding up the item scores per schema to finally add together the schema scores to a total domain score. A client's score on the questionnaire is ranked "low", "medium", "high" or "very high". At a given classification of high or very high on a schema, a client's schema is seen as dysfunctional, hence, indicates the presence of problems in the associated Schema Domain. The psychometric properties of the YSQ are seen as reliable and valid (Rijkeboer, Van den Bergh, & Van den Bout, 2005). Furthermore, the construct validity of the YSQ is assessed as good (Rijkeboer, Van den Bergh, & Van den Bout, 2011).

Brief Symptom Inventory (BSI): The Brief System Inventory (BSI; Derogatis, & Melisaratos, 1983) is a self-report questionnaire which measures the degree of psychopathological mental distress a client experienced in the past week by various symptoms. This clinical recovery based survey with its 53 questions examines the following nine subscales of mental distress with a 5-point scale (from "none at all" to "very much"): somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism (Derogatis, & Melisaratos, 1983). Furthermore, the BSI provides three indicators that give information about one's psychological wellbeing, the number of symptoms present and the severity of present symptoms. Because this study is held in a Dutch healthcare setting, the Dutch version of the BSI (De Beurs, 2011) is used in this study, wherein the total score of the BSI indicates the overall score for mental distress. With its sufficient reliability and validity, the psychometric properties of the BSI are seen as good (Beurs, 2011; COTAN, 2012).

Mental Health Continuum-Short Form (MHC-SF): The Mental Health Continuum-Short Form (SF-MHC; Keyes, 2002) is a self-report questionnaire that measures positive mental health by 14 items on a 6-point scale ranging from "never" (0) to "every day" (5) (Lamers, Westerhof, Bohlmeijer, Ten Klooster, & Keyes, 2011). Positive mental health consists out of three major components: emotional, psychological and social wellbeing. Emotional wellbeing refers to feelings of happiness, pleasure, and interest in life. psychological wellbeing, on the other hand, refers to the optimal functioning of an individual. Social wellbeing refers to the optimal functioning of a person in society (Lamers et al., 2011).

Covariates: Based on the electronic clinical data (ECD; Faden, Kass, Whicher, Stewart & Tunis, 2013) information about 45 common client characteristics is collected. This includes information about clients' demographics (i.e. gender and age), diagnosis (DSM Axis I comorbidity), treatment history (i.e. none, policlinic, daycare, clinical care and crisis), stagnation in different life domains (i.e. work, close relationships, emotions, social contacts, self-perception, stress and rage, view of others and social conformity) and diagnosis (i.e. substance disorders, schizophrenia, mood disorders, anxiety disorders, dissociative disorders, paraphilia, eating disorders, impulse control, adjustment disorders, pervasive disorders, attention disorders, cognitive disorders, learning disorders, intellectually challenged, paranoid PD, schizoid PD, schizotypal PD, antisocial PD, borderline PD, histrionic PD, narcissistic PD, avoidant PD, dependent PD, obsessive PD, PD NOS, mental retardation, and dissociative identity disorder). Only the variables gender, age and comorbidity are further explored in this study.

Measures collected but not included in this report: In addition to the above-mentioned questionnaires (i.e. YSQ, BSI and MHC-SF), the House-Tree-Person Test (HTP; Buck, & Warren, 1992), Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Butcher, Dahlstrom, Graham, Tellegen & Kreammer, 1989), Young Compensation Inventory (YCI; Young, 1994), Young Parenting Inventory (YPI; Young, 1994) and Young-Rygh Avoidance Inventory (YRAI; Young, 1994) were also part of the test battery of the research conducted in this setting. The HTP, MMPI-2, YCI, YPI, and YRAI are not of importance for this study, therefore discarded from further discussion within this article.

Statistical analysis

All data was analyzed by using IBM SPSS Statistics version 22^{TM}. Before the data was analyzed, normal distribution of the data was established, and no significant violation of the assumptions was detected. Also, various variables were computed from the given dataset. The preparation of the dataset included the computation of various additional variables which are further described below. As it was mentioned in the introduction, the YSL focuses on 18 different dysfunctional schemas, which are computed into the five common Schema Domains (respectively Disconnection and Rejection, Impaired Autonomy and Performance, Impaired Limits, Other-Directedness and Over-vigilance and Inhibition) described by Young (1994). Further, with the data on mental wellbeing (measured by MHC-SF), three variables regarding the subtypes of wellbeing (respectively emotional, social and psychological) were computed. Also, a total score of mental distress (measured by BSI), as well as the count of comorbid

DSM axis I disorders, were computed.

To assess which of the possible predictor variables forge the most promising prediction model, the predictors in this study were selected by two alternate ways. As suggested by Guyon and Elisseeff (2003), who compared several methods to improve predictor performance, a variable ranking method (correlation coefficient) and a subset selection method (backward elimination) are used. This preliminary correlational analysis revealed several possible predictors, while it excluded other potential predictors explained further below. Next, these selected variables were entered into an initial regression model and further backward elimination prediction models, resulting in two promising models. After completing the data preparation, further statistical steps were carried out to provide an answer to the research question.

To explore the link between dysfunctional schema domains, symptoms of mental distress, wellbeing (respectively emotional, social and psychological) and clients' characteristics (respectively age, sex, and comorbidity), descriptive statistics were carried out, and correlations were calculated by Pearson's correlation coefficient. Because of the difficulties in establishing proper prediction models with a correlation coefficient selection method, the r value was lowered from a medium $r \geq .30$ to a minimum of a small $r \geq .10$ (e.g. Cohen, 1988; Aron, & Aron, 1994). Since this study is of explorative nature, this adaption enables predictive models with more than one predictor, which makes it possible to observe also smaller predictive trends. After determining the common client characteristics, multiple regression analyses are carried out with the correlating factors. In these analyses, dysfunctional schema domains, symptoms of mental distress and the status of wellbeing (respectively emotional, social and psychological) forge two models, with a total of five sub-prediction models.

In the first model, wellbeing (respectively emotional, social and psychological), is examined in an explorative manner. Along these lines, the following statistical steps are carried out for each subscale of mental wellbeing. Thus, analyses are performed three times in a row with the same set of possible predictors at T1 (respectively Disconnection and Rejection, Impaired Autonomy and Performance, Impaired Limits, Other-Directedness, Over-Vigilance, dysfunctional schema domains total and mental distress total) and overall (respectively Comorbidity, Age, and Sex). First, an initial prediction model is formed by placing all promising predictor variables, determined by correlational analysis, in one regression model. This linear regression is carried out with dysfunctional schema domains and symptoms of mental distress at T1 (pre-treatment) in order to predict the status of

emotional, social and psychological wellbeing at T3 (end-treatment). Second, to detect whether there are other promising prediction models, further linear regressions are carried out. In this case, backward elimination is carried out to determine the most promising prediction model in predicting the three subtypes of wellbeing mentioned above. All corresponding statistical measures are listed below to give more detailed information about only the initial regression model and the most promising backward elimination regression model. All other models are seen as interim statistical steps, therefore have no further importance to this paper. These statistical steps result in one prediction model, which operates throughout the clinical recovery approach and eventually predicts ones' level of wellbeing (respectively emotional, social and psychological) by the level of mental distress or dysfunctional schema domains.

The statistical analyses for the second model resemble the statistical steps from the regression analyses stated above. To answer the second sub-question, this paragraph focuses on exploring Schema Domains and mental distress at T3 in an explorative manner. The following statistical steps are carried out twice with the same predictors at T1 (respectively wellbeing total, emotional wellbeing, social wellbeing and psychological wellbeing) and overall (respectively Comorbidity, Age and Sex): descriptive statistics, bivariate correlation analysis to determine promising predictor variables, linear regression is carried out to determine the initial regression model and backwards elimination is carried out to determine the most promising prediction model. Here too, regression models which function as interim steps are not further mentioned. Also, statistical measures of all individual predictors of the initial regression and backward elimination model are explained further below. These statistical steps result in one prediction model, which operates throughout the personal recovery approach and eventually predicts ones' level of mental distress or Dysfunctional Schema Domains by the level of ones' wellbeing (respectively emotional, social and psychological).

Results

Exploring wellbeing

To examine possible predictors of Emotional, Social, and Psychological Wellbeing, various potential predictors are explored by several regression analyses. Table 2.1 provides an overview of the descriptive statistics regarding the three potential outcomes at T3 (respectively Emotional, Social and Psychological Wellbeing) and the ten possible predictors at T1 and overall (respectively Age, Sex, and Comorbidity).

Table 2.1. *Summary Statistics for Multivariate Regression Variables*

Variable	Mean	Sd	Minimum	Maximum	N
Emotional Wellbeing T3	1.81	.75	1	3	
Social Wellbeing T3	1.46	.56	1	3	
Psychological Wellbeing T3	1.90	.69	1	3	
Disconnection Rejection T1	.59	.14	1	3	
Impaired Autonomy and Performance T1	.53	.13	1	3	
Impaired Limits T1	.45	.12	1	3	
Other-Directedness T1	.65	.15	1	3	
Over-Vigilance T1	.60	.11	1	3	
Dysfunctional Schema Domains Total T1	.45	.13	.22	.75	
Mental Distress Total T1	.57	.50	1	3	
Count Comorbidity Axis I	1.38	.85	0	3	
Age	27.39	6.40	17.67	43.92	
Sex **male**					18 (26%)
female					50 (74%)

Emotional Wellbeing. First, correlation analysis was conducted to explore the abovementioned potential predictors. Table 2.2 displays an overview of the bivariate correlation matrices for all variables. Inspection of the correlation matrix in this table identifies four elevated correlation coefficients, which correlate mediocre or high with the criterion Emotional Wellbeing. Only the correlation coefficient Other-Directedness (.24) is high, whereas Impaired Autonomy and Performance (.12), Impaired Limits (.17) and Schema Total (.13) are mediocre, and therefore only these four predictors forge the initial regression model.

Table 2.2. *Excerpt: Bivariate Correlation Matrix of All Predictor Variables and the Criterion Emotional Wellbeing*

Variable	Emotional Wellbeing T3
1. Emotional Wellbeing T3	-
2. Disconnection Rejection T1	.04
3. Impaired Autonomy and Performance T1	**.12**
4. Impaired Limits T1	**.17**
5. Other-Directedness T1	**.24***
6. Over-Vigilance T1	.06
7. Dysfunctional Schema Domains Total T1	**.13**
8. Mental Distress Total T1	.04
9. Count Comorbidity Axis I	.01
10. Age	-.07
11. Sex	.08

* Correlation is significant at the .05 level (2-tailed).

Notes: Bold printed variables are being taken into account in the initial regression model (see Table 2.3, Model 1A). For a complete overview of the Bivariate Correlation Matrix of all variables, see Appendix C, Table 2.2.

Second, multiple regression analyses are carried out to examine the relationship between the criterion Emotional Wellbeing and the four potential predictors as stated above. Differentiating between the initial regression (Model 1A), with its four predictors, and the most promising backward elimination regression (Model 1B), Table 2.3 summarizes the results of the multivariate regression analyses and the variance inflation factor (VIF). The multiple regression models of the initial regression with four predictors (Impaired Autonomy and Performance T1, Dysfunctional Schema Domains Total T1, Impaired Limits T1 and Other-Directedness T1) produced $R^2 = .12$, $F(4.63) = 2.13$, $p = .087$. The backward elimination formed multiple regression models with three predictors (Dysfunctional Schema Domains Total T1, Impaired Limits T1, and Other-Directedness T1), which produced $R^2 = .12$, $F(4.63) = 2,89$, $p = .042$. Besides, as seen in Table 2.3, none of the variance inflation factors are exceeding the value 10 (*VIF minimum* = 1.33 and *VIF maximum* = 7.99), which suggests that there is no serious multicollinearity which requires correction.

Third, when comparing the explained variance of Model 1A (*Adj R^2* = .06) with Model 1B (*Adj R^2* = .08), it shows that Model 1B (Dysfunctional Schema Domains Total T1, Impaired Limits T1, and Other-Directedness T1) is the better model for predicting Emotional Wellbeing, because it explains approximately 8% of its variance significantly. When looking at the three different predictors more closely, two certain non-significant trends can be described as follows: Impaired Limits T1 explains 5% ($ß = .23$, $p > .05$) and Dysfunctional

Schema Domains Total T1 explains 19% (β = -.43, p > .05) of the variation in Emotional Wellbeing, when controlling for all other predictor variables. In conclusion, when controlling for the other predictor variables in the model, only Other-Directedness T1 explains 35% (β = .59, p < .05) of the degree of Emotional Wellbeing in a significant manner.

Table 2.3. *Multivariate Regression Analysis with Emotional Wellbeing as criterion*

Independent Variables	Model 1A Initial Regression					Model 1B Backward Elimination				
	P	R²	B	ß	VIF	p	R²	B	ß	VIF
Intercept	.06		1.04			.052		1.04		
Disconnection Rejection T1	-	-	-	-	-	-	-	-	-	-
Impaired Autonomy and Performance T1	.971	.00	.05	.01	4.07	-	-	-	-	-
Impaired Limits T1	.091	.05	1.49	.12	1.33	.088	.05	1.49	.23	1.33
Other-Directedness T1	.012*	.35	2.90	.59	3.74	.011*	.35	2.89	.59	3.67
Over-Vigilance T1	-	-	-	-	-	-	-	-	-	-
Dysfunctional Schema Domains Total T1	.189	.19	-3.08	-.44	7.90	.074	.19	-3.08	-.43	4.11
Mental Distress Total T1	-	-	-	-	-	-	-	-	-	-
Count Comorbidity Axis I	-	-	-	-	-	-	-	-	-	-
Age	-	-	-	-	-	-	-	-	-	-
Sex	-	-	-	-	-	-	-	-	-	-
					R2 = .12 *Adjusted R2 = .06* *R = .35*					*R2 = .12* *Adjusted R2 = .08* *R = .35*

* p < .05 (2-tailed).

Notes: Model 1A includes four potentially causal independent variables chosen by correlation. Model 1B includes only three independent variables, which are the ones with the lowest p-value due to backward elimination. The dependent variable in both models is Emotional Wellbeing. The *p*-values are based on a two-tailed test that the true coefficient is zero.

Social Wellbeing. First, correlation analysis was conducted to explore the abovementioned potential predictors. Table 2.4 displays an overview of the bivariate correlation matrices for all variables. Inspection of the correlation matrix in this Table identifies four elevated correlation coefficients, which correlate mediocre or high with the criterion Social Wellbeing. Only the correlation coefficients of Other-Directedness (.16), Over-Vigilance (.16), Schema Total (.10) and Comorbidity (.14) are mediocre, and therefore only these four predictors forge the initial regression model.

Table 2.4. *Excerpt: Bivariate Correlation Matrix of All Predictor Variables and the Criterion Social Wellbeing*

Variable	Social Wellbeing T3
1. Social Wellbeing T3	-
2. Disconnection Rejection T1	.06
3. Impaired Autonomy and Performance T1	-.05
4. Impaired Limits T1	.02
5. Other-Directedness T1	**.16**
6. Over-Vigilance T1	**.16**
7. Dysfunctional Schema Domains Total T1	**.10**
8. Mental Distress Total T1	-.05
9. Count Comorbidity Axis I	**.14**
10. Age	-.06
11. Sex	.09

Notes: Bold printed variables are being taken into account in the initial regression model (see Table 2.5, Model 2A). For a complete overview of the Bivariate Correlation Matrix for all variables, see Appendix C, Table 2.4.

Second, multiple regression analyses are carried out to examine the relationship between the criterion Social Wellbeing and the four potential predictors as stated above. Differentiating between the initial regression (Model 1A), with its four predictors, and the most promising backward elimination regression (Model 1B), Table 2.5 summarizes the results of the multivariate regression analyses and the variance inflation factor (VIF). The multiple regression models of the initial regression with four predictors (Other-Directedness T1, Over-Vigilance T1, Dysfunctional Schema Domains Total T1 and Comorbidity) produced $R^2 = .10$, $F(4.63) = 1.79$, $p = .143$. The backward elimination formed a multiple regression model with one predictor (Over-Vigilance T1), which produced $R^2 = .04$, $F(1.65) = 2.58$, $p = .113$. Besides, as seen in Table 2.5, none of the variance inflation factors are exceeding the value 10 (*VIF minimum* = 1.00 and *VIF maximum* = 6.05), which suggests that

there is no serious multicollinearity which requires correction.

Third, when comparing the explained variance of Model 2A (*Adj R²* = .05) with
Model 2B (*Adj R²* = .02), it shows that Model 2A (Other-Directedness T1, Over-Vigilance
T1, Dysfunctional Schema Domains Total T1 and Comorbidity) would be the better model
for predicting Social Wellbeing. However, this model does not explain the variance in Social
Wellbeing in a significant manner. In other words, at this point, there is no promising
prediction model for predicting Social Wellbeing at T3 by the chosen predictor variables
(Other-Directedness T1, Over-Vigilance T1, Dysfunctional Schema Domains Total T1 and
Comorbidity) at T1.

Table 2.5. *Multivariate Regression Analysis with Social Wellbeing as criterion*

Independent Variables	Model 2A Initial Regression					Model 2B Backward Elimination				
	p	R^2	B	ß	VIF	p	R^2	B	ß	VIF
Intercept	.008		1.05			.022		.87		
Disconnection Rejection T1	-	-	-	-	-	-	-	-	-	-
Impaired Autonomy and Performance T1	-	-	-	-	-	-	-	-	-	-
Impaired Limits T1	-	-	-	-	-	-	-	-	-	-
Other-Directedness T1	.123	.11	1.20	.39	3.15	-	-	-	-	-
Over-Vigilance T1	.078	.15	1.97	.39	3.37	.082	.04	.97	.19	1.00
Dysfunctional Schema Domains Total T1	.062	.31	-2.92	-.56	6.05	-	-	-	-	-
Mental Distress Total T1	-	-	-	-	-	-	-	-	-	-
Count Comorbidity Axis I	.273	.02	.09	.14	1.18	-	-	-	-	-
Age	-	-	-	-	-	-	-	-	-	-
Sex	-	-	-	-	-	-	-	-	-	-
				R2 = .10 Adjusted R2 = .05 R = .32					*R2 = .04* Adjusted R2 = .02 R = .19	

Notes: Model 2A includes four potentially causal independent variables chosen by correlation. Model 2B includes only one independent variable, which are the ones with the lowest p-value due to backward elimination. The dependent variable in both models is Social Wellbeing. The *p*-values are based on a two-tailed test that the true coefficient is zero.

Psychological Wellbeing. First, correlation analysis was conducted to explore the abovementioned potential predictors. Table 2.6 displays an overview of the bivariate correlation matrices for all variables. Inspection of the correlation matrix in this Table identifies four elevated correlation coefficients, which correlate mediocre or high with the criterion Psychological Wellbeing. Only the correlation coefficients of Other-Directedness (.24) and Over-Vigilance (.22) are high, whereas only Disconnection and Rejection (.10), Impaired Autonomy and Performance (.12), Impaired Limits (.12) and Comorbidity (.18) are mediocre, and therefore only these five predictors forge the initial regression model.

Table 2.6. *Excerpt: Bivariate Correlation Matrix of All Predictor Variables and the Criterion Psychological Wellbeing*

Variable	Psychological Wellbeing T3
1. Psychological Wellbeing T3	-
2. Disconnection Rejection T1	**.10**
3. Impaired Autonomy and Performance T1	**.12**
4. Impaired Limits T1	**.12**
5. Other-Directedness T1	**.24***
6. Over-Vigilance T1	**.22**
7. Dysfunctional Schema Domains Total T1	**.21**
8. Mental Distress Total T1	.01
9. Count Comorbidity Axis I	**.18**
10. Age	-.03
11. Sex	-.01

* Correlation is significant at the .05 level (2-tailed).
Notes: Bold printed variables are being taken into account in the initial regression model (see Table 2.7, Model 3A). For a complete overview of the Bivariate Correlation Matrix for all variables, see Appendix C, Table 2.6.

Second, multiple regression analyses are carried out to examine the relationship between the criterion Psychological Wellbeing and the four potential predictors as stated above. Differentiating between the initial regression (Model 3A), with its six predictors, and the most promising backward elimination regression (Model 3B), Table 2.7 with one predictor summarizes the results of the multivariate regression analyses and the variance inflation factor (VIF). The multiple regression models of the initial regression with all six predictors (Disconnection and Rejection T1, Impaired Autonomy and Performance T1, Impaired Limits T1, Other-Directedness T1, Over-Vigilance T1 and Comorbidity) produced $R^2 = .12$, $F(6.61) = 1.36$, $p = .247$. The backward elimination formed a multiple regression model with one predictor (Other-Directedness T1), which produced $R^2 = .07$, $F(1.65) = 4.83$,

p = .032. Besides, as seen in Table 2.7, none of the variance inflation factors are exceeding the value 10 (*VIF minimum* = 1.00 and *VIF maximum* = 2.50), which suggests that there is no serious multicollinearity which requires correction.

Third, when comparing the explained variance of Model 3A (*Adj R²* = .03) with Model 3B (*Adj R²* = .05), it shows that Model 3B (Other-Directedness T1) is the better model for predicting Psychological Wellbeing because it explains approximately 5% of the variation. Since only Model 3B significantly can predict Psychological Wellbeing at T3 by the predictor variables at T1, this is the better prediction model. Which means that the degree of Other-Directedness at T1 predicts approximately 7% (*ß* = .26, *p* < .05) of the level of Psychological Wellbeing.

Table 2.7. *Multivariate Regression Analysis with Psychological Wellbeing as criterion*

Independent Variables	Model 3A Initial Regression					Model 3B Backward Elimination				
	p	R^2	B	ß	VIF	p	R^2	B	ß	VIF
Intercept	.148		.78			.002		1.14		
Disconnection Rejection T1	.271	.04	-.99	-.20	2.30	-	-	-	-	-
Impaired Autonomy and Performance T1	.508	.02	-.66	-.13	2.50	-	-	-	-	-
Impaired Limits T1	.296	.01	.80	.14	1.18	-	-	-	-	-
Other-Directedness T1	.088	.10	1.45	.32	2.39	.032*	.07	1.18	.26	1.00
Over-Vigilance T1	.382	.03	1.01	.16	2.34	-	-	-	-	-
Dysfunctional Schema Domains Total T1	-	-	-	-	-	-	-	-	-	-
Mental Distress Total T1	-	-	-	-	-	-	-	-	-	-
Count Comorbidity Axis I	.835	.02	.11	.13	1.20	-	-	-	-	-
Age	-	-	-	-	-	-	-	-	-	-
Sex	-	-	-	-	-	-	-	-	-	-

R2 = .12	*R2 = .07*
Adjusted R2 = .03	*Adjusted R2 = .05*
R = .34	*R = .26*

* p < .05 (2-tailed).

Notes: Model 3A includes four potentially causal independent variables chosen by correlation. Model 3B includes only one independent variable, which are the ones with the lowest p-value due to backward elimination. The dependent variable in both models is Psychological Wellbeing. The *p*-values are based on a two-tailed test that the true coefficient is zero.

Exploring Schema Domains and Mental Distress

To examine possible predictors of Dysfunctional Schema Domains and the level of Mental Distress, various potential predictors are explored by several regression analyses. Table 3.1 provides an overview of the descriptive statistics regarding the two criteria at T3 (respectively Dysfunctional Schema Domains and Mental Distress) and the seven possible predictors at T1 and overall (Age, Sex, and Comorbidity).

Table 3.1. *Summary Statistics for Multivariate Regression Variables*

Variable		Mean	Sd	Minimum	Maximum	N
Dysfunctional Schema Domains Total T3		.45	.13	.22	.75	
Mental Distress Total T3		.59	.50	0	1	
Wellbeing Total T1		1.43	.56	1	3	
Emotional Wellbeing T1		1.60	.76	1	3	
Social Wellbeing T1		1.42	.50	1	3	
Psychological Wellbeing T1		1.56	.64	1	3	
Count Comorbidity Axis I		1.26	.85	0	3	
Age		27.43	6.83	17.67	43.92	
Sex	**male**					18 (26%)
	female					50 (74%)

Dysfunctional Schema Domains. First, correlation analysis was conducted to explore the abovementioned potential predictors. Table 3.2 displays an overview of the bivariate correlation matrices for all variables. Inspection of the correlation matrix in this Table identifies four elevated correlation coefficients, which correlate mediocre or high with the criterion Dysfunctional Schema Domains. Only the correlation coefficients of Wellbeing Total (-.38), Emotional Wellbeing (-.30), Social Wellbeing (-.36) and Psychological Wellbeing (-.34) and Comorbidity (.22) are high, whereas no other variables are mediocre, and therefore only these five predictors forge the initial regression model.

Table 3.2. *Excerpt: Bivariate Correlation Matrix of All Predictor Variables and the Criterion Dysfunctional Schema Domains*

Variable	Dysfunctional Schema Domains Total T3
1. Dysfunctional Schema Domains Total T3	-
2. Wellbeing Total T1	**-.38****
3. Emotional Wellbeing T1	**-.30***
4. Social Wellbeing T1	**-.36***
5. Psychological Wellbeing T1	**-.34***
6. Count Comorbidity Axis I	**.22**
7.Age	.03
8. Sex	.00

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).

Notes: Bold printed variables are being taken into account in the initial regression model (see Table 3.3, Model 4A). For a complete overview of the Bivariate Correlation Matrix for all variables, see Appendix C, Table 3.2.

Second, multiple regression analyses are carried out to examine the relationship between the criterion Dysfunctional Schema Domains and the five potential predictors as stated above. Differentiating between the initial regression (Model 4A), with its five predictors, and the most promising backward elimination regression (Model 4B), Table 3.3 summarizes the results of the multivariate regression analyses and the variance inflation factor (VIF). The multiple regression models of the initial regression with all five predictors produced (Wellbeing Total T1, Emotional Wellbeing T1, Social Wellbeing T1, Psychological Wellbeing T1, and Comorbidity) $R^2 = .23$, $F(7.42) = 1.76$, $p = .121$. The backward elimination formed a multiple regression model with one predictor (Wellbeing Total T1), which produced $R^2 = .15$, $F(1.47) = 8.20$, $p = .006$. Besides, as seen in Table 3.3, none of the variance inflation factors are exceeding the value 10 (*VIF minimum* = 1.00 and *VIF maximum* = 7.24), which suggests that there is no serious multicollinearity which requires correction.

Third, when comparing the explained variance of Model 4A (*Adj R²* = .12) with Model 4B (*Adj R²* = .13), it shows that Model 4B (Wellbeing Total T1) is the better model for predicting Emotional Wellbeing because it explains approximately 13% of the variance. Since only Model 4B significantly can predict Dysfunctional Schema Domains at T3 by the predictor variable Wellbeing Total T1, this is the better prediction model. Which means that the degree of Other-Directedness at T1 predicts 15% ($ß = -.38$, $p < .01$) of the level of Dysfunctional Schema Domains.

Table 3.3. *Multivariate Regression Analysis with Dysfunctional Schema Domains as criterion*

Independent Variables	Model 4A Initial Regression					Model 4B Backward Elimination				
	p	R²	B	ß	VIF	p	R²	B	ß	VIF
Intercept	.000		.57			.000		.57		
Wellbeing Total T1	.789	.01	-.02	-.10	7.24	.006**	.15	-.08	-.38	1.00
Emotional Wellbeing T1	.620	.01	-.02	-.11	25	-	-	-	-	-
Social Wellbeing T1	.230	.05	-.06	-.23	1.99	-	-	-	-	-
Psychological Wellbeing T1	.848	.00	-.01	-.06	4.55	-	-	-	-	-
Count Comorbidity Axis I	.134	.04	.03	.21	1.01	-	-	-	-	-
Age	-	-	-	-	-	-	-	-	-	-
Sex	-	-	-	-	-	-	-	-	-	-

	R2 = .21		*R2 = .15*
	Adjusted R2 = .12		*Adjusted R2 = .13*
	R = .46		*R = .38*

* p < .05   ** p < .01 (2-tailed).

Notes: Model 4A includes four potentially causal independent variables chosen by correlation. Model 4B includes only one independent variable, which are the ones with the lowest p-value due to backward elimination. The dependent variable in both models is Dysfunctional Schema Domains. The *p*-values are based on a two-tailed test that the true coefficient is zero.

Mental Distress. First, correlation analysis was conducted to explore the abovementioned potential predictors. Table 3.4 displays an overview of the bivariate correlation matrices for all variables. Inspection of the correlation matrix in this Table identifies four elevated correlation coefficients, which correlate mediocre or high with the criterion Mental Distress. Only the correlation coefficient of Social Wellbeing (.40) is high, whereas only Wellbeing Total (.18) and Comorbidity (.13) are mediocre, and therefore only these three predictors forge the initial regression model.

Table 3.4. *Excerpt: Bivariate Correlation Matrix of All Predictor Variables and the Criterion Mental Distress*

Variable	Mental Distress Total T3
1. Mental Distress Total T3	-
2. Wellbeing Total T1	**.18**
3. Emotional Wellbeing T1	.01
4. Social Wellbeing T1	**.40***
5. Psychological Wellbeing T1	.09
6. Count Comorbidity Axis I	**.13**
7.Age	-.01
8. Sex	-.00

* Correlation is significant at the .01 level (2-tailed).
Notes: Bold printed variables are being taken into account in the initial regression model (see Table 3.5, Model 5A). For a complete overview of the Bivariate Correlation Matrix for all variables, see Appendix C, Table 3.4.

Second, multiple regression analyses are carried out to examine the relationship between the criterion Mental Distress and the three potential predictors as stated above. Differentiating between the initial regression (Model 5A), with its three predictors, and the most promising backward elimination regression (Model 5B), Table 3.5 summarizes the results of the multivariate regression analyses and the variance inflation factor (VIF). The multiple regression models of the initial regression with all three predictors (Wellbeing Total T1, Social Wellbeing T1 and Comorbidity) produced $R^2 = .19$, $F(3.45) = 4.27$, $p = .009$. The backward elimination formed a multiple regression model with one predictor (Social Wellbeing), which produced $R^2 = .16$, $F(1.55) = 10.34$, $p = .002$. Besides, as seen in Table 3.5, none of the variance inflation factors are exceeding the value 10 (*VIF minimum* = 1.00 and *VIF maximum* = 1.95), which suggests that there is no serious multicollinearity which requires correction.

Third, when comparing the explained variance of Model 5A (*Adj R²* = .15) with Model 4B (*Adj R²* = .14), it shows that Model 5A (Social Wellbeing, Wellbeing Total, and Comorbidity) is the better model for predicting Mental Distress because it explains approximately 15% of the variation. Since only Model 5A significantly can predict Mental Distress at T3 by the predictor variables at T1, this is the better prediction model. When looking at the three different predictors more closely, two certain non-significant trends can be described as follows: Wellbeing Total T1 explains 3% ($ß$ = -.18, p > .05) and Count Comorbidity Axis I T1 explains 2% ($ß$ = .13, p > .05) of the variation in Mental Distress, when controlling for all other predictor variables. In conclusion, when controlling for the other predictor variables in the model, only Social Wellbeing T1 explains 27% ($ß$ = .52, p < .01) of the degree of Mental Distress in a significant manner.

Table 3.5. *Multivariate Regression Analysis with Mental Distress as criterion*

Independent Variables	Model 5A Initial Regression					Model 5B Backward Elimination				
	p	R²	B	ß	VIF	p	R²	B	ß	VIF
Intercept	.832		-.05			.866		.03		
Wellbeing Total T1	.306	.03	-.14	-.18	1.95	-	-	-	-	-
Emotional Wellbeing T1	-	-	-	-	-	-	-	-	-	-
Social Wellbeing T1	.003**	.27	.53	.52	1.94	.002*	.16	.40	.40	1.00
Psychological Wellbeing T1	-	-	-	-	-	-	-	-	-	-
Count Comorbidity Axis I	.283	.02	.08	.13	1.00	-	-	-	-	-
Age	-	-	-	-	-	-	-	-	-	-
Sex	-	-	-	-	-	-	-	-	-	-
					R2 = .19					*R2 = .16*
					Adjusted R2 = .15					*Adjusted R2 = .14*
					R = .44					*R = .40*

* p < .05   ** p < .01 (2-tailed).

Notes: Model 1 includes four potentially causal independent variables chosen by correlation. Model 2 includes only one independent variable, which are the ones with the lowest p-value due to backward elimination. The dependent variable in both models is Mental Distress. The *p*-values are based on a two-tailed test that the true coefficient is zero.

Discussion and Conclusions

As discussed earlier, the presence of distress or dysfunctional schemas and the absence of wellbeing can be important variables in assessing a persons' mental health status, especially when diagnosed with a personality disorder (PD). When treating PDs, there are different forms of therapy that have been proven effective by research, for example the schema-focused therapy (SFT); e.g. Schaap et al., 2016; Thunnissen, & Muste, 2005). Nowadays different forms of treatment are often carried out through a more classical view of psychology: the clinical recovery approach, which focuses on a clients' level of symptoms first. A more modern approach is the personal recovery approach, which focuses on a clients' level of wellbeing first. However, when attempting to provide clients with therapy that has the most promising therapy outcomes, it is yet unclear which subject one should attend to first when starting therapy: a clients' symptoms or wellbeing. Once the direction of the prediction becomes known, it could be suggested that the health care system should operate from only the most predictive model, provide clients with a more suitable recovery approach, thus provide them with better care eventually.

The first model to discuss uses a clients' current status of symptoms to predict ones' level of wellbeing. This model consists of three prediction models described as follows. Model 1B (see above Table 2.3) explains approximately 8% of the variance in Emotional Wellbeing by its three predictors before beginning the treatment (respectively impaired limits, other-directedness and schema total). When all three predictor variables are considered together, they significantly predict whether a client has a low or high level of emotional wellbeing at the end of the treatment. Further, this prediction model indicates that clients with higher scores on other-directedness before beginning the treatment are expected to have higher scores on emotional wellbeing at the end of the treatment, after controlling for the other variables in the prediction model. Another link between emotional wellbeing and other-directedness is described by Worthington, Van Oyen Witvliet, Pietrini and Miller (2007) in a study about measuring the impact of different kinds of forgiveness on ones' status of mental health. They found that emotional forgiveness replaces negative unforgiving emotions with positive other-oriented emotions. Further, Worthington and colleagues (2007) found that this action leads to psychological changes which have positive consequences on ones' status of mental health and wellbeing. The commonality in todays' study findings and the results of Worthington and colleagues (2007) is that a person has the intention of creating a more positive interpersonal connection between the individuals which leads to a higher state of

wellbeing. Therefore, it seems possible that other-directedness is a key variable in predicting emotional wellbeing.

Further, Model 2A (see above Table 2.5) explains approximately 5% of the variance in Social Wellbeing by its four predictors before beginning the treatment (respectively other-directedness, over-vigilance, schema total, and comorbidity). When all four predictor variables are considered together, it seems that there is a trend in predicting whether a client has a low or high level of social wellbeing at the end of the treatment. However, this prediction model indicates that no prediction variable did contribute to the model in a significant manner. Therefore, no causal relationships between variables may be deduced at this point. Contrary to findings of Cramer and colleagues (2006) about the effect psychological distress has on wellbeing, these findings do not support earlier stated expectations regarding the prediction of social wellbeing.

Last, Model 3B (see above Table 2.7) explains approximately 5% of the variance in Psychological Wellbeing by its only predictor (other-directedness). When the predictor variable is considered, the model significantly predicts whether a client has a low or high level of psychological wellbeing. Further, this prediction model indicates that clients with higher scores on other-directedness before beginning the treatment are expected to have higher scores on psychological wellbeing at the end of the treatment, after controlling for the other variables in the model. Also, these results are in line with earlier discussed findings of Bamelis and colleagues (2014) regarding the effectiveness of SFT and the increased level of wellbeing as well as social and overall functioning in clients diagnosed with a PD. These findings support earlier stated expectations relating to the prediction of psychological wellbeing. Not discussed variables did not contribute to the prediction of this model in a significant matter.

Comparing these three prediction models, the level of the dysfunctional schema other-directedness is a common factor in predicting the level of ones' wellbeing. As a result, other-directedness is seen as a possible key variable, when making predictions of ones' level of wellbeing on all three dimensions. All other predictor variables entered into abovementioned prediction models seem more changeable regarding the different dimensions of wellbeing. According to Maslow's theory about the hierarchy of needs (1943), there is a foundation of basic needs that must be met and satisfied before higher levels of the hierarchy can be fulfilled. Starting at the bottom, the order in which most human beings fulfill their basic human needs, as suggested by Maslow (1943), is as follows: physiological needs (e.g. breathing, sleep), safety needs (e.g. job security, medical security), emotional needs (e.g.

belonging, give and receive love), esteem (e.g. self-respect, reputation) and self-actualization (e.g. wisdom, morality). The schema domain other-directedness consists of different dysfunctional schemas which all focus on others desires, feelings, and needs. This happens at the expense of ones' own needs to attain attention, approval, and love by others (Gök, 2012). One might conclude that the schema domain other-directedness is linked with Maslow's basic emotional needs humans desire to satisfy.

By building up on Maslow's theory, this link could explain why other-directedness appears to be a key variable in predicting overall wellbeing. For example, if a client was diagnosed with a PD and he or she then successfully fulfilled his or her emotional needs by attaining emotional warmth of others throughout strategies the client learned during therapy, he or she can focus on the next steps of Maslow's' hierarchy, namely esteem and self-actualization. The clients' new focus could, in turn, provide a further increase in wellbeing. With this knowledge in mind, today's' focal point in schema-focused therapy (SFT) for clients with a PD could be adjusted by focusing more on the schema domain other-directedness and focusing less on subordinate schema domains (e.g. over-vigilance), because the dysfunctional schema other-directedness had a greater predicting value on all three forms of wellbeing that has been studied in this research. This small change could make SFT more effective eventually because it could provide clients with a better understanding of their basic human needs, which in turn could lead to more positive therapy outcomes. Hence, apart from various potential predictors, other-directedness and social wellbeing could be key variables in predicting overall wellbeing, which is advised to explore further in future research.

Although the first model, which predicts wellbeing, does make significant predictions when using a clients' symptoms as predictor variables, one should also examine the second prediction model before reaching a conclusion about the utilization of the first prediction model. Similar to the exploration of wellbeing, various possible prediction variables for dysfunctional schema domains and mental distress are also explored by correlational analysis and backward elimination. This resulted in the second prediction model as seen below.

The second model to discuss uses a clients' current status of wellbeing to predict ones' level of symptoms. This model consists of two prediction models described as follows. Model 4B regarding the prediction of Dysfunctional Schema Domains (see above Table 3.3) explains approximately 13% of the variance by its only predictor (wellbeing total). When the predictor variable is considered, it significantly predicts whether a client has a low or high level of dysfunctional schema domains. Further, this prediction model indicates that clients with higher scores on wellbeing total before beginning the treatment are expected to have

lower scores on dysfunctional schema domains at the end of the treatment. Because wellbeing total is the only predictor in this model, there is no need for controlling for other variables.

Next, Model 5B regarding the prediction of <u>Mental Distress</u> (see above Table 3.5) explains approximately 15% of the variance by its only predictor (social wellbeing). When the predictor variable social wellbeing is considered, it significantly predicts whether a client has a low or high level of mental distress. Further, this prediction model indicates that clients with higher scores on wellbeing total before beginning the treatment are expected to have higher scores on mental distress at the end of the treatment. Because social wellbeing is the only predictor in this model, there is no need for controlling for other variables.

Various studies on social wellbeing have shown that social support is positively related to one's' status of physical and mental health. Perceived social support, for example, is among others linked with lower degrees of hopelessness (Pehlivan, Ovayolu, Ovayolu, Sevinç, & Camcı, 2012), which can help clients to retain health for a longer period of time. Sustaining therapy effects for a longer period of time could reduce health care cost by fewer relapses into old habits and dysfunctional schemas. Further, a study by Flynn, Kecmanovic, and Alloy (2010) indicates that a higher level of social wellbeing can be linked to a lower score of mental distress. For these reasons, it is suggested to focus more on social wellbeing during therapy to provide clients with the possibility of more positive and more sustainable treatment outcomes. This knowledge could help further understand the importance of the factor social wellbeing as a key component in predicting mental distress in clients diagnosed with a PD.

The current study's' provides promising indications to peruse prediction models that use the clients' current status of mental health to predict his or her status of mental health after attending therapy. For various reasons, it is important to investigate these models further. Economic costs for the health care sector could be reduced by providing clients with more personalized treatment. However, more important is the possibility that better care could be provided to clients diagnosed with a complex DSM axis II disorder, like a personality disorder. Also, the amount of therapy needed and the duration of therapy could be reduced eventually. With more accurate prediction models revealed and applied, the intake procedure could be improved by assigning clients to the therapy approach that, according to the prediction model, suits the client best. This in turn might lead to better treatment outcomes for clients seeking treatment for interaction problems due to a personality disorder. Utilizing the right prediction model into the health care setting might even reduce the chances of relapse, providing clients with a more suitable recovery approach since the intake

procedure started. Further, not less important, working with these prediction models can lead to an increase in clients' quality of life eventually.

It is advised to consider the study's outcomes within the context of its limitations. It appears that the total sample size used in the current study is too small to be able to detect strong effects in the different statistical prediction models. Only clients of a particular department of a mental health care facility were accepted as participants in this study. By expanding the selection criteria, more information could be gathered about the validity of the developed models. One example of such an expansion could be to allow all clients, who did attend treatment for a PD being, to be part of future research, which in turn might lead to a bigger sample size. Also, by working together with several healthcare facilities, which provide a comparable form of treatment for PD's, broadening the sample could lead to the discovery of other influencing variables, which will be discussed further below. It is suggested that future studies should test larger samples to be able to reveal whether predictions, which explain a high percentage of variation, can be made appropriately.

Further, incomplete questionnaires by non-responding clients and dropout resulted in an even more decreased number of participants for today's study. Due to ethical reasons, clients were free to decide whether or not they wanted to fill in the questionnaires at the different points of time (respectively T1, T2, T3 and T4), which may have resulted in a high non-responding rate, because of the earlier mentioned stress clients reported after filling in these questionnaires. Also, a client's decision to stop the treatment early automatically resulted in a drop-out as a participant of this study from the day the client left the healthcare facility. However, data was retrieved up until that point has still been utilized in order to obtain a sufficient sample size. Since it is not ethical to deprive clients of therapy or to use other repercussions in case of not responding, future research should be aware of a high non-response rate and drop-out. In general, a drop-out rate between 5% and 35% is accumulated for in social studies (Hogan, Roy & Korkontzelou, 2004). When working in a clinical setting with clients who are diagnosed with a PD, researchers should anticipate for a rather high drop-out rate of approximately 35% or higher.

There are several possible options to deal with this enormous amount of data loss. For instance, using data of drop-outs and anticipating in a high drop-out rate in future research and gather approximately 20% to 40% more participants than needed to limit missing data. Another option is not to use accumulated data of drop-outs but to impute missing data. On the one hand, this would enhance the total number of participants, because fewer clients have to be excluded from future test administration. On the contrary, a high rate of imputed data

makes the generalizability of the study's' outcome questionable. On these grounds, it is chosen not to impute any missing data in today's' study but to include data of drop-outs.

Another limitation of the current study, which should be adjusted for in future research, is the size of the test battery. As mentioned earlier, today's study was part of a bigger study by Schaap and colleagues (2016) about the effectiveness of schema-focused therapy. With no less than eight different questionnaires in this test battery, clients needed approximately 150 minutes to complete the questionnaires. Often clients brought to the researcher's attention afterward that these long sessions have led to tiredness and discomfort by confrontation with one's own mental health problems. Although the original study (Schaap et al., 2016) are approved by the ethics committee, further minimizing the number of questionnaires in the test battery might decrease the stress clients experience during and shortly after filling in the questionnaires. Prior to reducing the test battery to a minimum quantity, it is suggested to carefully research the possible impact of the tests and variables to be eliminated.

Further investigations may also indicate whether the results of today's study are reliable, valid and therefore generalizable. For this reason, it is suggested that future research also assesses the test-retest reliability among other forms of reliability. Also, the high non-response rate might have an impact on the study's validity, which needs to be further assessed in the future. Because the study's reliability and validity are not specifically addressed in this paper, there might be other dependent and explanatory variables than the ones explored here.

Combining the new insights about the clinical recovery approach regarding the first model with its three prediction models, it can be assumed that the level of mental distress and active dysfunctional schema domains can predict wellbeing to a certain degree. The primary focus of current treatment is to decrease mental health care problems first, which can make room for therapy approaches that focus on increasing wellbeing afterward. As seen in many clients and many published articles, this clinical recovery approach has worked effectively for the last decennia. One form of an effective proven therapy is the Schema-Focused Therapy (SFT) used to treat clients diagnosed with a personality disorder. These findings are supported by different published articles, including a recently published article by Schaap et al. (2016) about the effective treatment of adults with personality disorders, which is able to significantly decrease symptoms of psychological distress and increase the level of wellbeing. Considering recent study outcomes, it can be assumed that the health care system should keep the clinical recovery approach in use. Therefore, mental health institutions should initially provide clients with therapy that reduces mental health care problems, and after that provide

clients with therapy that increases wellbeing, which leads to the overall conclusion that the current recovery approach seems to offer solid treatment. However, results of todays' study have shown that the prediction model linked to the clinical recovery approach has an overall predictive value of only 8%.

Combining the new insights about the personal recovery approach regarding the two established prediction models in predicting mental health problems (respectively dysfunctional schema domains and mental distress) by ones' level of wellbeing seems an important predictor variable in future research. Focusing first on improving a clients' wellbeing by fulfilling their basic needs (Maslow, 1943), then reducing mental health problems could result in better treatment outcomes by more motivated and healthy clients. It is assumed that increasing ones' level of emotional, social, psychological and overall wellbeing would function as a buffer, which seems to be needed in order to be able to reduce ones' mental health problems. Recent research confirms this assumption. In various studies, this buffer is mentioned as necessary for long-lasting changes regarding the health care status of a client (e.g. Diener, & Chan, 2011; Frederickson, 2001). This buffer can be traced back to the broaden and build theory, described by Frederickson (2001). According to this theory, having a certain level of positive emotions at ones' disposal makes it possible to build enduring personal resources within mental and physical areas (Frederickson, 2001). After building up these basic resources, humans are able to forge on this structure and broaden their abilities by either antagonizing mental health problems or by flourishing on life domains that already reached a stable level. Based on these findings, it could also be assumed that the health care system can be further optimized by changing the order of therapy provided to a more personalized recovery approach. Therefore, clients should be provided with therapy that focuses on increasing ones' wellbeing primarily to construct a certain buffer, from which the client wins the resources to engage in therapy that decreases mental health care problems. The results of todays' study have shown that the prediction model linked to the personal recovery approach has an overall predictive value of 15%. Since this predictive value in predicting ones' level of symptoms is almost twice as high as the predictive value of the first model in predicting wellbeing, the second prediction model is considered the better one. In other words, applying these prediction models for choosing appropriate therapeutic measures can provide a more client-oriented treatment approach. Therefore, the model regarding the personal recovery approach, which uses wellbeing to predict one's status of mental health, is suggested to be utilized in todays' health care system.

The current study investigates several prediction models for predicting wellbeing,

dysfunctional schema domains, and mental distress by exploring various potential predictors. Today's research provides a step in the right direction to an answer in an ongoing discussion about being able to predict dysfunctional schema domains, mental distress and wellbeing (respectively emotional, social and psychological). Summarizing the results, today's study indicates that two promising prediction models are found, which significantly explain up to 15% of the variance in the criterion. However, when trying to answer the main question of this paper regarding "What comes first: The chicken or the egg?" this study provides a clear answer: Wellbeing. In other words, therapy should focus first on assessing a client's level of wellbeing before the beginning of the treatment to predict ones' level of symptoms after the treatment. In this paper, this prediction model is linked to the personal recovery approach which is more relatable to the field of positive psychology rather than the classic psychology which focuses on a clients' level of symptoms first. This study is an interesting step, which has given more insight into prediction models regarding the status of mental health. Future research could build on this step, and new discoveries can be made on this topic.

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Appendix

The following appendixes are displayed in two different languages. More specific, Appendix A (information about the study) and Appendix B (informed consent) are displayed in Dutch, as originally used in this study, whereas Appendix C (complete overview of the bivariate correlation matrixes) is provided in the language of this paper, thus in English.

Appendix A: Information about the study

INFORMATIEFOLDER

wetenschappelijk onderzoek

Evaluatieonderzoek bij schemagerichte klinische groepsbehandeling

Achtergrond van het onderzoek

Mediant is een middelgrote GGZ instelling in Twente, waar zich ongeveer 6000 cliënten per jaar melden met uiteenlopende psychische klachten. Een van de specialistische onderdelen van Mediant is het centrum voor klinische psychotherapie "De Wieke". Bij de Wieke volgen (jong)volwassen cliënten een behandeltraject van 3 tot 12 maanden, welke zich richt op het verminderen van psychische klachten en het verbeteren van het sociaal functioneren. Er wordt gewerkt met schemagerichte therapie. De behandeling is intramuraal en heeft tot doel de gestagneerde persoonlijkheidsontwikkeling weer op gang te brengen, in een veilige omgeving. Er worden maximaal 27 cliënten in de leefgroep behandeld. Daarnaast participeert de cliënt in een therapiegroep, die uit maximaal 9 cliënten bestaat. Naast de groepsgerichte activiteiten is het ook mogelijk een individueel behandeltraject samen te stellen.
De behandelduur varieert van 3 tot 12 maanden, waarbij de meeste cliënten de volledige 12 maanden opgenomen worden. Er kan aansluitend een nazorgtraject plaatsvinden.

Onduidelijk is in hoeverre deze klinische groepsbehandeling effect heeft op een verandering van onderliggende schemas. De hypothese is dat klinische behandeling leidt tot afname van de door cliënten gerapporteerde schemas/klachten. Dit onderzoek betreft een exploratief onderzoek naar effecten van dit klinische groepsbehandeltraject.

Wat is het doel van het onderzoek?

We willen met dit onderzoek inzicht krijgen in het effect van de klinische groepsbehandeling op schemas. En de uitkomsten willen we gebruiken om de behandeling te verbeteren.

Wat betekent mijn deelname voor mij?

Bij de intake krijgt iedereen een psychologisch onderzoek met zelfrapportagevragenlijsten. Hierin worden onder andere psychische klachten en schemas gemeten. Dat noemen we de beginmeting; zo kom je binnen bij de Wieke. Deelname aan dit onderzoek betekent dat je aan het eind van je behandeling deze vragenlijsten nogmaals invult. Dat noemen we de eindmeting; zo verlaat je de Wieke. Ook zal je een half jaar na beëindiging van behandeling worden benaderd (schriftelijk of per e-mail) om dezelfde vragenlijsten nogmaals in te vullen. Dat noemen we de follow up; we willen weten of de veranderingen in schemas na een half jaar gelijk zijn gebleven.

Wat gebeurt er met mijn gegevens?

De gegevens van het onderzoek worden anoniem verwerkt en zullen op geen enkele manier tot jouw te herleiden zijn. Je scores worden zonder je naam ingevoerd in een statistiek programma waarna we gaan kijken of we op groepsniveau effecten zien. Mocht je zelf graag de uitslagen van de vragenlijsten willen, dan kan je dat aangeven. We zullen er voor zorgen dat je dan persoonlijk binnen vier weken bericht krijgt met de uitkomsten.

Wat als ik niet mee wil doen?

Deelname aan dit onderzoek is geheel vrijwillig. Als je niet mee wilt doen heeft dit geen enkele invloed op de behandeling die je krijgt aangeboden. Ook kan je altijd tussentijds besluiten dat je niet meer mee wilt doen, waarbij dat geen consequenties heeft voor je behandeltraject.

Ik heb nog andere vragen

Als je nog vragen hebt kun je altijd contact opnemen met de coördinator van het onderzoek: T███████████████@mediant.nl, 053 – ██████.

Ook als je wilt meedoen aan het onderzoek, kan je met de onderzoekscoördinator contact op nemen. Je wordt dan uitgenodigd om een toestemmingsverklaring te tekenen en zal daarna vanzelf voor de verschillende metingen worden opgeroepen.

Appendix B: Informed consent

TOESTEMMINGSVERKLARING

Deelname wetenschappelijk onderzoek:

Evaluatieonderzoek bij schemagerichte klinische groepsbehandeling

Hierbij verklaar ik dat ik bereid ben deel te nemen aan het onderzoek 'Evaluatieonderzoek bij schemagerichte klinische groepsbehandeling'.

Ik heb van de onderzoeker schriftelijke en mondelinge informatie gekregen over de inhoud, methode en doel van het onderzoek. Ik heb mijn vragen kunnen stellen en die zijn naar tevredenheid beantwoord. Ik begrijp waarover het onderzoek gaat.

Ik stem vrijwillig in met deelname aan dit onderzoek. Ik heb voldoende tijd gehad om te beslissen of ik mee wil doen. Ik begrijp dat als ik niet meer mee wil doen, ik het onderzoek op ieder moment stop kan zetten.

Ik begrijp dat ik mijn vragen altijd kan stellen aan de onderzoekscoördinator:
T█████████████@mediant.nl, 053 – █████.

Naam   :
Geboortedatum   :

Datum   :

Handtekening   :

Ondergetekende, verantwoordelijke onderzoeker, verklaart dat de hierboven genoemde persoon zowel schriftelijk als mondeling over het bovenvermelde onderzoek is geïnformeerd. Hij/zij verklaart tevens dat een voortijdige beëindiging van de deelname door bovengenoemde persoon, van geen enkele invloed zal zijn op de zorg die hem of haar toekomt.

Naam   :
Functie   :

Datum   :

Handtekening :

Appendix C: Complete overview of the bivariate correlation matrixes

Table 2.2. *Bivariate Correlation Matrix of All Predictor Variables and the Criterion Emotional Wellbeing*

Variable	1	2	3	4	5	6	7	8	9	10
1. Emotional Wellbeing T3	-	-	-	-	-	-	-	-	-	-
2. Disconnection Rejection T1	.04	-	-	-	-	-	-	-	-	-
3. Impaired Autonomy and Performance T1	.12	.62**	-	-	-	-	-	-	-	-
4. Impaired Limits T1	.17	.34**	.38**	-	-	-	-	-	-	-
5. Other-Directedness T1	.24*	.61**	.65**	.19*	-	-	-	-	-	-
6. Over-Vigilance T1	.06	.67**	.63**	.42**	.63**	-	-	-	-	-
7. Dysfunctional Schema Domains Total T1	.13	.87**	.85**	.48**	.79**	.86**	-	-	-	-
8. Mental Distress Total T1	.04	.14	.12	.09	.16	.05	.14	-	-	-
9. Count Comorbidity Axis I	.01	.20*	.22**	.09	.19*	.26**	.26**	.13	-	-
10. Age	-.07	.25**	.06	.15	.09	.11	.19*	.04	-.01	-
11. Sex	.08	-.15	-.14	.09	-.17*	-.09	-.15	-.09	-.05	.24**

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).

Table 2.4. *Bivariate Correlation Matrix of All Predictor Variables and the Criterion Social Wellbeing*

Variable	1	2	3	4	5	6	7	8	9	10
1. Social Wellbeing T3	-	-	-	-	-	-	-	-	-	-
2. Disconnection Rejection T1	.06									
3. Impaired Autonomy and Performance T1	-.05	.62**								
4. Impaired Limits T1	.02	.34**	.38**							
5. Other-Directedness T1	.16	.62**	.65**	.19*						
6. Over-Vigilance T1	.16	.67**	.63**	.42**	.63**					
7. Dysfunctional Schema Domains Total T1	.10	.87**	.85**	.48**	.79**	.86**				
8. Mental Distress Total T1	-.05	.14	.12	.09	.16	.05	.14			
9. Count Comorbidity Axis I	.14	.20*	.22**	.09	.19*	.26**	.26**	.13		
10. Age	-.06	.25**	.06	.15	.09	.11	.19*	.04	-.01	
11. Sex	.09	-.15	-.14	.09	-.17*	-.09	-.15	-.09	-.05	.24*

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).

Table 2.6. *Bivariate Correlation Matrix of All Predictor Variables and the Criterion Psychological Wellbeing*

Variable	1	2	3	4	5	6	7	8	9	10
1. Psychological Wellbeing T3	-	-	-	-	-	-	-	-	-	-
2. Disconnection Rejection T1	.10	-	-	-	-	-	-	-	-	-
3. Impaired Autonomy and Performance T1	.12	.62**	-	-	-	-	-	-	-	-
4. Impaired Limits T1	.12	.34**	.38**	-	-	-	-	-	-	-
5. Other-Directedness T1	.24*	.62**	.65**	.19*	-	-	-	-	-	-
6. Over-Vigilance T1	.22	.67**	.63**	.42**	.63**	-	-	-	-	-
7. Dysfunctional Schema Domains Total T1	.21	.87**	.85**	.48**	.79**	.86**	-	-	-	-
8. Mental Distress Total T1	.01	.14	.12	.09	.16	.05	.14	-	-	-
9. Count Comorbidity Axis I	.18	.20*	.22**	.09	.19*	.26**	.26**	.13	-	-
10. Age	-.03	.25**	.06	.15	.09	.11	.19*	.04	-.01	-
11. Sex	-.01	-.15	-.14	.09	-.17*	-.09	-.15	-.09	-.05	.24**

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).

Table 3.2. *Bivariate Correlation Matrix of All Predictor Variables and the Criterion Dysfunctional Schema Domains*

Variable	1	2	3	4	5	6	7
1. Dysfunctional Schema Domains Total T3	-	-	-	-	-	-	-
2. Wellbeing Total T1	-.38**	-	-	-	-	-	-
3. Emotional Wellbeing T1	-.30*	.69**	-	-	-	-	-
4. Social Wellbeing T1	-.36*	.61**	.41**	-	-	-	-
5. Psychological Wellbeing T1	-.34*	.82**	.60**	.56**	-	-	-
6. Count Comorbidity Axis I	.22	-.05	-.09	-.07	-.05	-	-
7.Age	.03	-.22*	-.03	-.16	-.17	-.01	-
8. Sex	.00	-.16	-.02	-.10	-.17	-.05	.24*

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).

Table 3.4. *Bivariate Correlation Matrix of All Predictor Variables and the Criterion Mental Distress*

Variable	1	2	3	4	5	6	7
1. Mental Distress	-	-	-	-	-	-	-
2. Wellbeing Total T1	.18	-	-	-	-	-	-
3. Emotional Wellbeing T1	.01	.69**	-	-	-	-	-
4. Social Wellbeing T1	.40**	.61**	.41**	-	-	-	-
5. Psychological Wellbeing T1	.09	.82**	.60**	.56**	-	-	-
6. Count Comorbidity Axis I	.13	-.05	-.09	-.07	-.05	-	-
7.Age	-.01	-.22*	-.03	-.16	-.17	-.01	-
8. Sex	-.00	-.16	-.02	-.10	-.17	-.05	.24**

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).