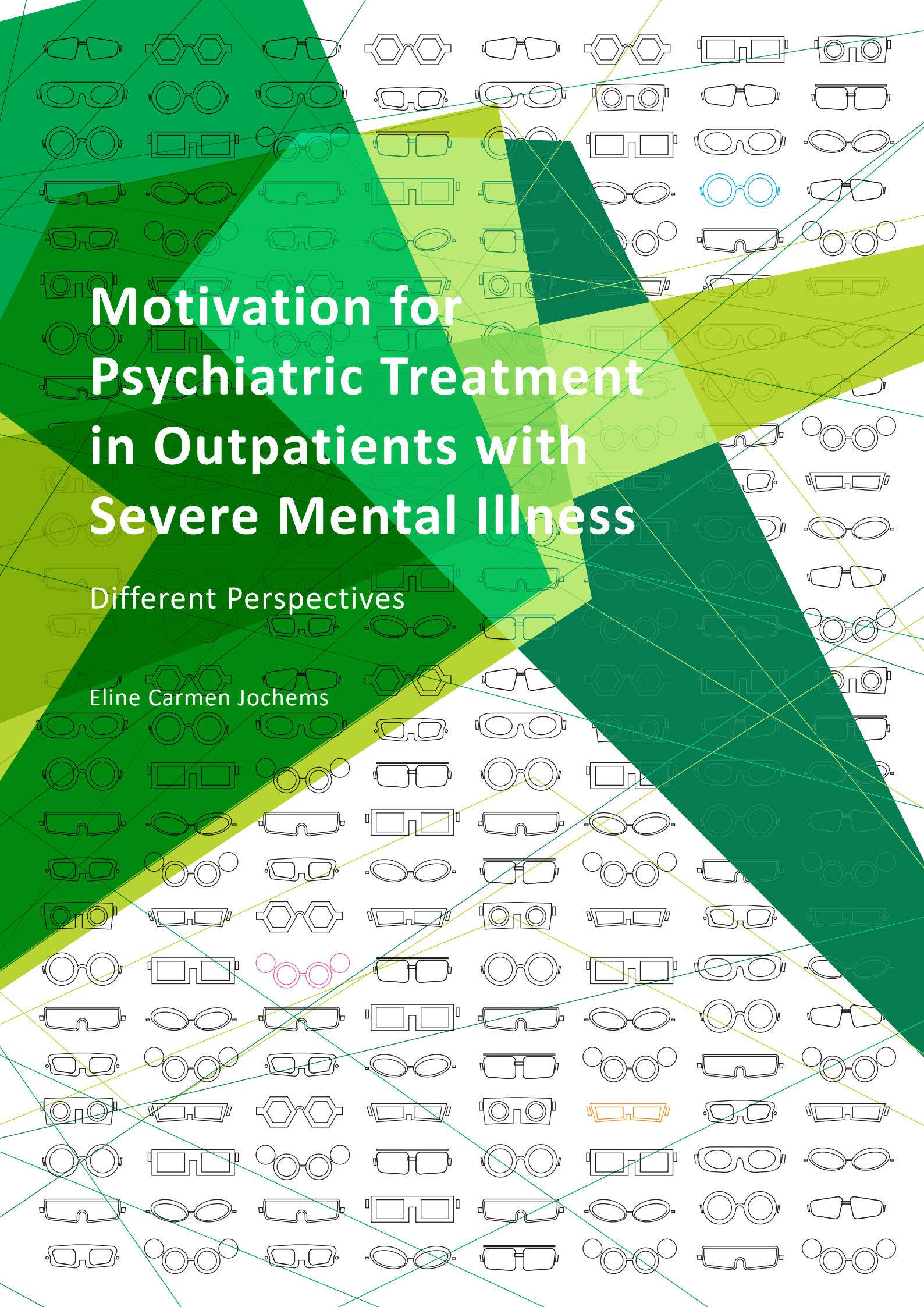

Motivation for Psychiatric Treatment in Outpatients with Severe Mental Illness

Different Perspectives

Eline Carmen Jochems

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Motivation for Psychiatric Treatment in Outpatients with Severe Mental Illness

Different Perspectives

Motivatie voor psychiatrische behandeling van ambulante patiënten met ernstige psychiatrische aandoeningen: verschillende perspectieven

Proefschrift
ter verkrijging van de graad van doctor
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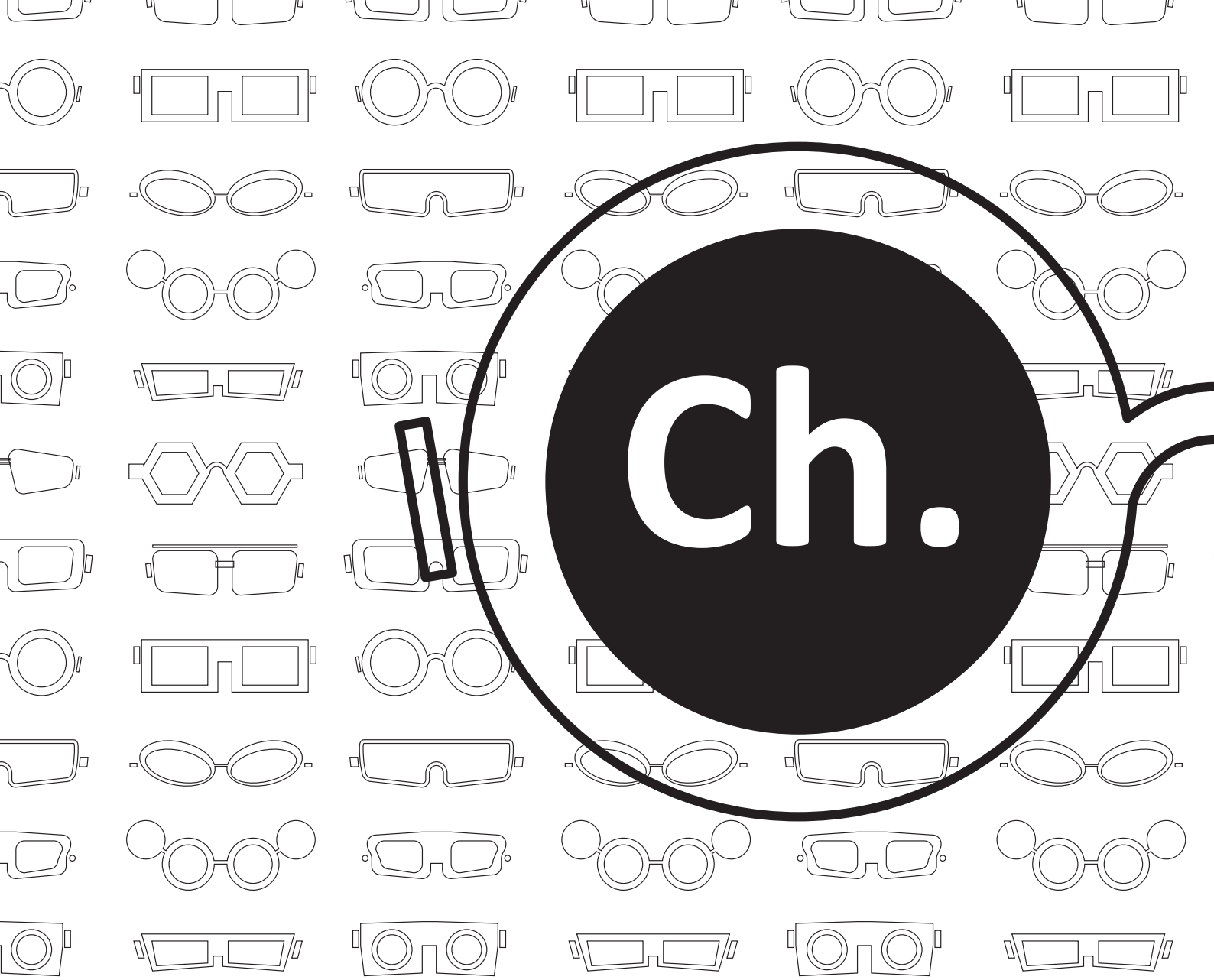
Erasmus University Rotterdam

Voor mijn ouders

Contents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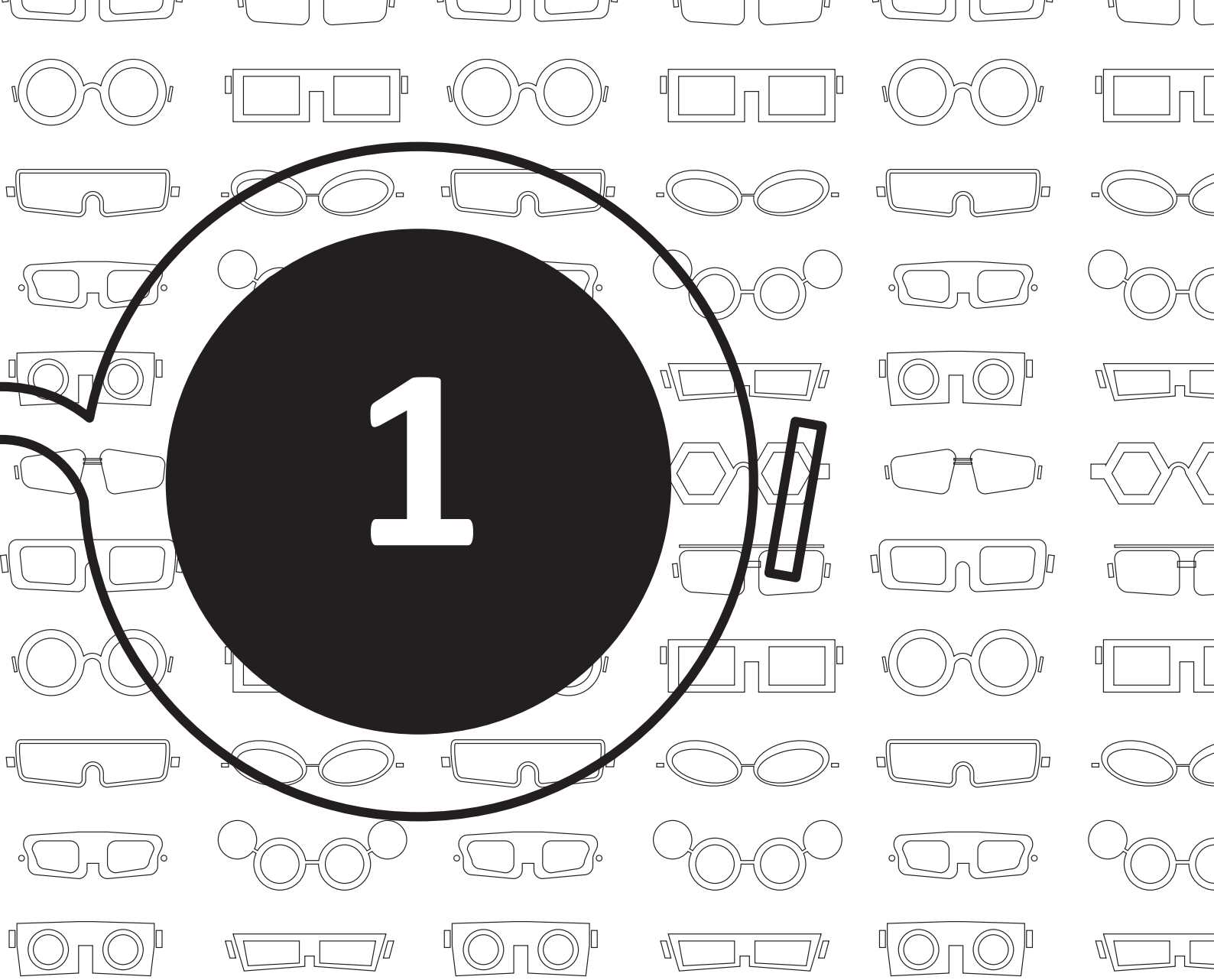
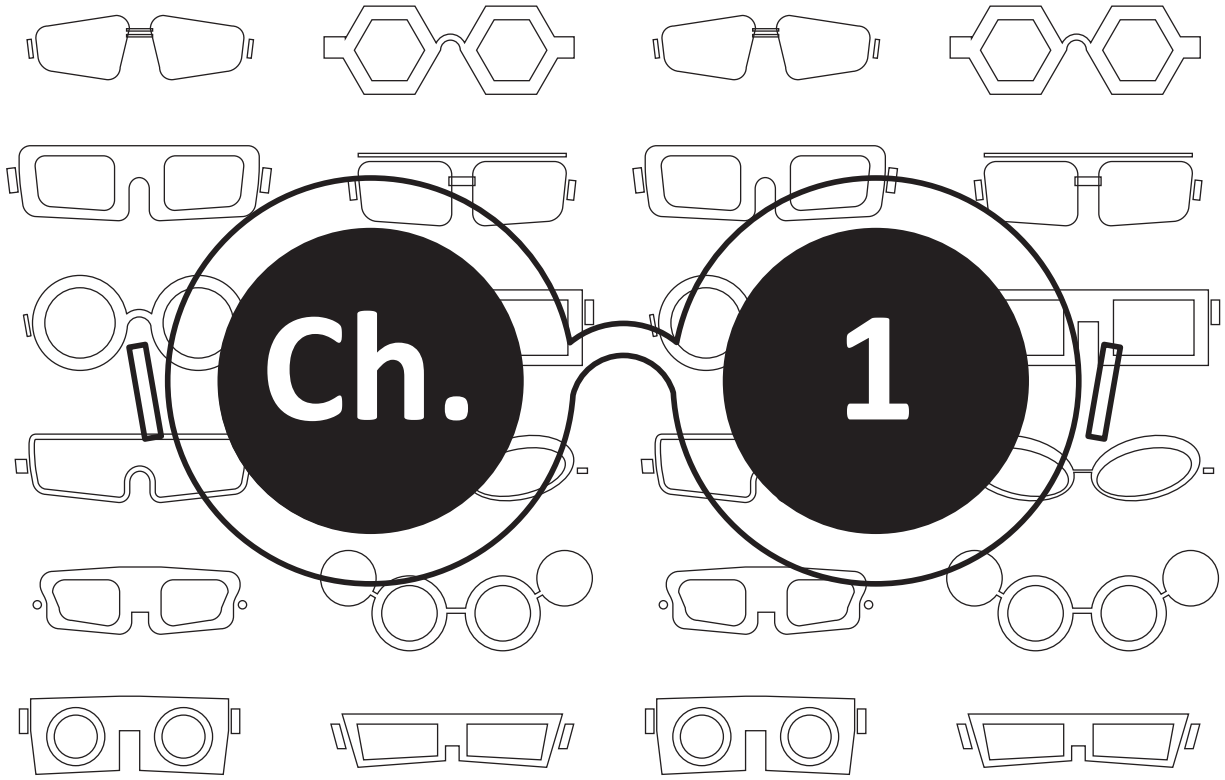


General Introduction



Introduction

What drives you to read this thesis (right now)? Are your drives different from other people reading this? And do you think that your drive to read it will have any influence on your behaviour in the future?

These questions all pertain to motivation, the concept that is central to this thesis. Specifically, the main objective of the thesis is to come to a better understanding of the motivation of patients with severe mental illness to engage with psychiatric treatment services and the influence of their motivation on subsequent treatment engagement behaviour and health outcomes. To let us understand and more fully bring the subject of this thesis into being, I would like to introduce you to Anna and Otto (please see the frames on the next pages)*.

After reading the stories of Anna and Otto, try to imagine their motives for engaging with psychiatric treatment services or vice versa, their motives for rejecting it. Why did Anna accept and reject treatment after treatment, taking her at least 7 psychologists to arrive at where she is right now? What has defined her motivation and that of her therapists to (dis)engage from treatment? What are the crucial factors that have helped Anna to engage with the treatment that is now offered? Is assertive outreach a better treatment model for her than 'regular' outpatient treatment for personality disorders (and if so, why)? Regarding Otto, why did he let Remco and his colleagues come in? Does Remco understand the motivation of Otto to accept treatment services? And will Otto keep refusing to accept medication for his psychotic symptoms or will Remco be able to motivate him to give it a try once again? What will happen if Otto never accepts medication for his psychotic symptoms? How does Otto perceive his current and future (psychosocial) functioning and how do mental health care professionals perceive it?

All of these motivational questions are relevant in daily clinical practice for patients with severe mental illness and for mental health professionals working with them. In this thesis, the above questions are considered in light of three motivation theories, as applied to the outpatient care for patients with severe mental illness in the Netherlands. Anna and Otto will return in the General Discussion of this thesis, where their stories will be reviewed in light of the three motivation theories.

* The characters and case descriptions of Anna and Otto as well as their therapists are fictional but based on real-life stories.

Anna

Anna is 32 years old and has already had a turbulent life. Her parents got divorced when she was 9 years old, after many years of physically abusing each other and neglecting Anna. From then, Anna lived with her mother. Around age 11, she started experiencing heavy mood swings and anger. She frequently clashed with her mother and felt alone. She started experimenting with alcohol and drugs at age 14 and got expelled from school at age 16. At this time, she tried to commit suicide for the first time, using all the pills that her mother kept in the house and a glass of whisky. In the years after this, Anna had many therapists who came and went. In the end, they all turned out to be "no good", according to Anna. She got admitted to psychiatric hospitals several times due to repeated suicide attempts, and was diagnosed with complex posttraumatic stress disorder and borderline personality disorder. Over the last 5 years, she has been treated by an assertive outreach team, who offer psychological treatment at home and keep in contact with her, including in periods of high distress, anger, and during hospitalizations.

Anna:
"I feel like I have finally entered a different phase in my life right now. I always felt that everything was doomed to fail for me. Now, when I am stressed, I can still become angry and suspicious, but I am learning how to reach out for help in these moments. At times, my emotions were so overwhelming that I gave up on treatment, and myself. For me, alcohol was a way to deal with those emotions. It has cost me a lot of time and energy to build some trust with the team, and to build confidence in myself. Now, I am trying to get a job as a waitress. The team helps me with this through individual placement and support. It's been 7 months since my last drink, but occasionally I still smoke weed."

Wilma (former psychologist of Anna):
"Anna was referred to me when she was 25 years old. I was her 7th psychologist. When I first expressed my compassion for Anna and told her that it must have been really hard for her as a child to have had parents who did not attend to her, she reacted offended. She didn't want me to be so critical of her parents and wondered if I meant to say that she should have known better and should have left home sooner. In the following weeks, I noticed that Anna became easily irritated by things that I said, and despite my attempts to try to understand and help her, I started doubting myself a little and became hesitant to provide feedback to Anna. I knew she had difficulties with attachment and with trust, but also felt that I could not get through to her. When I – cautiously – tried to discuss this with Anna, she took this as a personal attack and left the room angrily. Although such behavior is not uncommon in patients with borderline personality disorder, Anna's anger did not seem to pass. In the following months, she frequently did not show up for appointments, sometimes showed up drunk, and I felt unable to effectively work with Anna. This affected my own motivation in a negative way, and I also doubted whether she was motivated and ready for psychotherapy. When I asked her about this, she thought that I was going to end the treatment: "See, nobody cares for me, everybody drops me!". It turned out to be a self-fulfilling prophecy; she did not show up for appointments, I explained the necessary conditions for effective psychotherapy to her, she could not be reached for several weeks and I had to conclude that psychotherapy was currently not feasible. Just before her 27th birthday, she was re-admitted to the clinic and then referred to an assertive outreach team."

Otto

Otto is 43 years old and lives by himself in a rental apartment. He has been in and out of contact with mental health care services from age 22, when he was diagnosed with schizophrenia. Otto is convinced that a secret Chinese organization wants him dead and that they have spies who try to read his mind. They want to find out where he is and then poison him. His family is also involved, according to Otto, which is why he broke contact with them. Otto has been admitted to psychiatric hospitals four times, all of which were involuntary. These experiences were very distressing for Otto. When Otto was 26, he accused an Asian man of being a spy, which resulted in a fight and Otto being imprisoned. After his release, Otto was not able to keep a day job, but he managed to get a job as a night porter at a small hotel for many years. Although it was rare for Otto to talk extensively to others, as he feared they could be involved with the organization, he did enjoy the small talk with some of the guests. Three years ago however, there was a reorganization and he lost his job. Over the last years, problems started to accumulate. Otto got into financial problems, the housing association started complaining about stench and threatened with eviction. Otto was also becoming increasingly lonely but was afraid to leave his house, as the Chinese might spot him.

Remco (current case manager of Otto, specialized psychiatric nurse):
"We received word of Otto's situation through our network with other social services and we decided to reach out to him. We started visiting his house about a year ago. At first, the curtains were closed and Otto did not open the door. We left notes through his mailbox to inform him about who we were and what we could do for him. After several weeks of failed attempts, Otto came to the door once and agreed to let us in. We could see that he was skinny and it smelled like garbage in his apartment. He told us in an incoherent and rushed way about how he was certain that his food was poisoned, and that he was victim of Chinese voodoo (showing his right arm which had a rash). All the while, he looked at us in a suspicious way. We acknowledged that the rash was worrisome and that we were there to see if we could assist in his problems with the housing association and other stressors. Over the next days, he accepted our visits and gradually, he also accepted our help in cleaning his house and allowed us to assist him with financial problems. Otto talked more about his experiences and lifestyle. On the condition that he could wear a hat and sunglasses (such that he was less easily detected by the Chinese), we took him to see his house doctor for a physical examination. Otto's view on his problems is different from ours, which is why he still refuses medication, but he started taking better care of himself and he is gradually going outside more often."

Otto:
"This guy, Remco, he visits me every week. He asks me how I am doing and we go through my mail together. He is one of the few people that I like to talk to. Even if I don't open my door sometimes, because I'm not sure if it's safe, he keeps coming back. He listens and I feel like he respects me, even though he sometimes has a different view on things. He has explained how medication might help me, but from experience I know that this changes me… and I don't want that. Besides, my problem is not something psychological, the problem is the Chinese secret organization. They should be exposed and imprisoned. Remco knows I do not want to be admitted to a psychiatric hospital again and that I want to keep living here. Recently, he has offered to visit a daytime activities center with me, to see which activities I might like and to meet some people. He has done so much for me already, I might give it a shot."

In the following, it will be explained who is referred to when talking about 'patients with severe mental illness', why motivation for treatment is a relevant topic in this population and how 'motivation for treatment' may be defined. The chapter ends with an overview of the contents of this thesis.

Severe mental illness (SMI)

The term 'severe mental illness' is difficult to define and even controversial, as one may (successfully) argue that all mental illnesses are severe[1,2]. After all, "ask anyone who's been living with a mental illness for any length of time and they'll tell you it can be severe, debilitating, and even life-threatening"[2]. Nevertheless, the term 'severe mental illness' was introduced in the eighties of the previous century in an attempt to identify people who were most in need of mental health care, such that resources could be adequately targeted to such people[3,4]. In a comprehensive review where 17 definitions of SMI were compared, Schinnar et al. [5] found that between 4% and 88% of psychiatric patients qualified as having SMI, depending upon the definition selected. They concluded that the 1987 definition of the National Institute of Mental Health (NIMH) reached most consensus and was most representative of the middle range of prevalence estimates of 45% to 55%. This definition described severe mental illness as 1) *a diagnosis* of non-organic psychosis or personality disorder, 2) *a duration* characterised as involving "prolonged illness and long-term treatment" operationalised as a two-year or longer history of mental illness or treatment, and 3) *disability*, which is defined as role impairment in at three of eight domains: employment, self-care, self-direction, interpersonal relationships, learning, recreation, independent living and economic self-sufficiency[4,6].

Although most definitions of SMI have in common that they include criteria for diagnosis, duration and disability, there is still little consensus in the literature regarding the exact definition of SMI[3,6-8]. For example, some definitions include simplifications of the NIMH definition, such as including only people with a diagnosis of any non-organic psychotic disorder and a treatment duration of at least two years[6], while others reflect extensions of this definition to broader populations such as to those with any psychiatric disorder that is accompanied by severe impairments in social and/or societal functioning that requires professional coordinated treatment[9]. It appears that most definitions of SMI include diagnoses of psychotic disorders, personality disorders, bipolar disorders, major depressive disorders and/or substance abuse disorders[3-7]. Duration is commonly defined as duration of illness or as the type and/or duration of treatment[3,6,7], while disability is commonly defined as having several disabilities in the domains of housing, employment, finances, social support and relationships, organizing daily activities and/or problematic behaviour which results in intervention by the mental and/or judicial system[3,4,9].

In the current thesis, the definition of SMI is limited to people who receive outreaching, community based mental health care or were at least in contact with such mental health services (such that we may refer to them as patients) for treatment of a primary diagnosis of a psychotic disorder or personality disorder. This definition closely resembles the 1987 NIMH definition and was also chosen for pragmatic reasons. That is, people with these diagnoses could be easily identified based on the psychiatric diagnoses obtained from medical records of the participating community mental health teams, with a high likelihood that all three criteria for SMI would be met. For ease of reading, we will refer to our patient research population as patients with SMI in the remainder of this thesis. The following paragraph describes the outreaching community mental health services from which SMI patients were recruited in the current research project.

Patients with SMI in the context of Dutch psychiatric treatment

In the Netherlands, the group of adult people with severe mental illness is estimated to be between 120.000 to 160.000 people [9,10]. Of the general population, around 3% have a psychotic disorder, while around 8% has psychotic experiences that do not necessarily have a clinical psychotic disorder[11]. The prevalence of any personality disorder is estimated to be around 10%[12,13], but the prevalence of specific types of personality disorders differ. For example, it is estimated that around 0.4% to 4% of the population has a paranoid personality disorder, around 1% to 6% has borderline personality disorder and around 0.4% to 4% has an antisocial personality disorder[12,13].

The care for patients with SMI is increasingly being provided by so-called Flexible Assertive Community Treatment Teams (FACT) teams[10,14]. FACT is a team treatment model that aims to provide community-based, assertive, outreaching and supportive psychiatric services to individuals with SMI[14,15]. The formation of this type of care was driven by a movement towards more outpatient and less inpatient psychiatric treatment, more individual housing and less hospital beds and towards more patient autonomy and less patient dependence[16].

On average, a FACT team monitors about 250 patients, of which around 20% is in need of intensive high-frequent care at any time, while the other 80% need less intensive treatment and support[14]. To combine care for these two groups, the FACT team employs a flexible switching system. The group requiring the most intensive care is discussed daily and for this group the team adopts a shared caseload approach. Besides assertive outreach, there is an emphasis on out-of-office interventions and home visits. Van Veldhuizen[14] has described Dutch FACT as follows: *"FACT is a rehabilitation-oriented clinical case management model, which is based on the Assertive Community Treatment (ACT) model but is more flexible and able to serve a broader range of clients with severe mental illness. FACT offers the original ACT as one of several treatment or care models. The FACT team is a case management team with partly an individual approach and partly a team approach; the approach varies from patient to patient, depending on the patient's needs. For more stable long-term patients FACT provides coordinated multidisciplinary treatment and care by individual case management. Unstable patients at risk of relapse, neglect and readmission are provided with intensive assertive outreach care by the same team, working with a shared caseload for this subgroup"* (p.422). When patients constitute a danger to themselves or others and are not motivated for treatment, health care professionals can start a procedure such that these patients are committed to a psychiatric hospital[14]. During hospitalisations, the FACT team keeps into contact with the patient to secure continuity of care.

Patients with psychotic disorders constitute the majority of patients treated in (flexible) assertive community mental health teams in the Netherlands and patients with severe personality disorders constitute another significant part of the caseload[14,17]. Previous Dutch research suggests that patients with psychotic disorders and personality disorders constitute a higher chance of being perceived as 'difficult' by their clinicians[18] which puts them at higher risk of ineffective treatment strategies[18]. Also, patients with these diagnoses are more often considered non-adherent to treatment and tend to have problematically high rates of disengagement, as will be explained in the following paragraph.

Problem: disengagement from psychiatric treatment

Assuming that psychosocial and psychiatric treatments for patients with SMI are effective in reducing the burden of the mental illness and achieving better functioning and quality of life, engaging patients with such services is important [19,20]. Once patients are in contact with services, keeping up the engagement and adherence is of importance to maximize the treatment efficacy, especially for severe and persistent disorders where treatments are designed to prevent symptom recurrence[20]. Alternatively, treatment disengagement and non-adherence can compromise the (cost)-effectiveness of the treatment. Estimates of treatment disengagement vary across different psychiatric patient populations and depend on the definitions of disengagement and non-completion. For example, non-adherence to antipsychotic medication among patients with psychotic disorders was observed in over 50% of patients[21,22], while non-completion of personality disorder treatment is estimated at 37%[23]. Lehner et al.[24] found that among individuals in treatment for SMI, appointment failures ranged from 50% to 73%, drop-out estimates ranged from 14% to 92% and medication failure estimates ranged from 5% to 71%. Disengagement and non-completion of treatment pose a major problem for the successful treatment of patients with SMI, since they are associated with several clinical and socio-economic problems such as recurrent psychiatric problems, rehospitalisation, and increased risk of suicide and episodes of violence [24-26]. Thus, the consequences of nonadherence and disengagement can be devastating, both for patients and their families in terms of personal suffering, reduced quality of life as well as for society in general due to loss of income and direct costs of healthcare[27]. It is therefore not surprising that studies have focussed on determining which factors are related to (non-)adherence and treatment engagement, and that many trials have focused on adherence and engagement as primary intervention targets.

Factors related to treatment (dis) engagement and treatment outcomes

Research into the determinants of treatment engagement and completion of treatment in severe mental illness has revealed numerous important factors, including patient-related factors (e.g. age, ethnicity, beliefs about treatment efficacy, income level, psychiatric history), illness-related factors (e.g. the type of disorder, symptom severity, comorbidity) and treatment-related factors (e.g. treatment setting, type of treatment, treatment efficacy, adverse treatment effects, therapeutic alliance) [20,26,28,29]. Although some of these factors are static and cannot be influenced, others are more dynamic and may therefore be targeted in interventions to enhance treatment engagement.

The evaluation of the effectiveness of specific types of treatment is one of the most common approaches to empirical tests of therapeutic factors, as evidenced by the wealth of randomized controlled trials and meta-analyses in this area of research[30]. Other treatment-related factors are generally considered as non-specific factors or "common factors" that are at play in all types of treatment, and may also be subject to interventions. Among the common factors are the therapeutic relationship, goal consensus/collaboration, expressed empathy, positive regard, expectations of the patient and therapist characteristics[31]. It has been noted that the scientific exploration of common factors has gained considerable less attention in rigorous empirical (clinical) research[31] as compared to treatment methods, whereas these factors may prove to be of equal or even superior importance to treatment outcomes[31]. Although the therapeutic alliance and the expression of empathy are studied commonly, most of these studies are correlational studies (as opposed to experimental studies)[31]. The relative scarcity of rigorous empirical studies into common factors may be related to the notion that, of all aspects of treatment that can influence outcome, the treatment method is often considered the only aspect that can be manipulated in a clinical experiment to test its efficacy, and, if proven valuable, can be trained and disseminated to other mental health care professionals[31]. This approach can be argued to put the patient in the position of a "dependent variable" who is operated on by supposedly effective therapeutic techniques[32]. Alternatively, the common factor approach assumes that different kinds of treatment do not achieve their effects through their specific techniques and principles, but that their effectiveness is due to, often unacknowledged, factors that they share[31,33]. The common factors approach leaves more room for both patient and clinician characteristics as the mediators and moderators of change, next to the treatment methods. Supporters of the common factors approach hold that research into patient progress through treatment, including the use of feedback systems that provide therapists and patients with information about various common factors, have great potential to address the central matter of how change happens in treatment by considering a wider range of potential moderators of change than is typically attended to in trials [34].

One dynamic common factor that has long been recognized as an important determinant of treatment engagement is the patient's motivation to make the efforts required by the treatment [29,35-38]. At its most general level, the term motivation is used to explain reasons why people think and behave as they do [39]. Motivation has been ascribed to both internal mechanisms such as needs, desires and physiological processes, to functional processes such as goal-directed behaviours and attraction by incentives, and to short-term processes as well as the cause of all behaviour [40]. Distinctions have been made between implicit motives that function at an unconscious level and explicit goals that function at a conscious level, and between approach motivation (towards pleasurable experiences) and avoidance motivation (away from harmful experiences)[41]. In relation to psychiatric treatment, motivation may relate to *why* a patient (does not) engage in treatment, how hard the patient actually works at certain challenges that are presented during treatment (i.e. the *intensity*), how long the patient is willing to remain working at the activity (i.e. the *persistence*) and what the patient might be feeling and thinking while engaged in the treatment-related behaviour (i.e. the *emotions and cognitions* accompanying the behaviour)[42].

However, despite a large amount of literature regarding treatment motivation and probably due to an abundance of conceptualizations of 'motivation for treatment', it has proven difficult for both academics and clinicians to effectively work with the concept. Because of this, the choice of which definition of motivation is most appropriate for clinical practice for patients with SMI is not a straightforward one. Although the literature provides some guidance in which *variables* are important regarding motivation and treatment engagement, there is no consensus as to which *theory* is most precise and applicable in the explanation and prediction of treatment engagement in outpatients with SMI. There appears to be a lack of empirical comparisons between motivation theories, whereas such comparisons can advance what is currently known about intrapersonal changes and interpersonal differences in motivation, treatment engagement and outcomes in severely mentally ill patients. Therefore, the research in the current thesis aimed to empirically test and compare current influential definitions of motivation for treatment made by three different motivation theories.

Definitions and theories of motivation

Numerous theories of motivation and behaviour change exist today. In a recent paper by Davis et al. [43] who aimed to identify theories of potential relevance to public health interventions, 82 different theories emerged. The authors found that the most commonly used theories in the current literature are the Transtheoretical model[44], the Theory of Planned Behaviour[45], Social Cognitive theory[46], the Health Belief Model [47] and Self-Determination Theory [48]. In

search for a useful motivation theory for application in the context of outpatient community mental health for patients with SMI, we decided to examine three motivation theories for empirical testing in the context of treatment engagement in community mental health care in the Netherlands. These three theories were selected based on their dominance in the field [49-51], including the recognition that they are currently used in mental health care interventions or have been suggested by previous researchers to be potentially useful in this domain, they have gained considerable interest and popularity in the literature over recent years, and because they have the potential to provide a unique contribution to the understanding of treatment engagement in outpatients with SMI.

One of the most influential models of motivation and change is the Transtheoretical model (TTM) developed by Prochaska and DiClemente [44]. TTM has also been called the stages of change model, and is typically regarded as a model for motivation for change, as the motivation to engage in behaviour change increases with each progressive stage [37,52]. That is, clinicians should aim to identify their patients' readiness to change by specifying in which one of five stages the patient is in: precontemplation (not planning to change or even resistant to change), contemplation (considering change but not yet planning it), preparation (preparing to change soon), action (behaviour change has recently been achieved) or maintenance (long-term behaviour change has been achieved) [53]. When the appropriate stage is identified, specific interventions should be offered to help patients progress to the next stage or to maintain changes made [54]. The TTM has frequently been used as a basis for the development of health behaviour interventions, especially in the field of addictions [55]. It is estimated that around 25% to 35% of patients with SMI have co-occurring substance use problems[56], which explains why the TTM has gained popularity in the psychiatric treatment of patients who have co-occurring mental and addiction problems. Current studies suggest that TTM constructs can explain outcomes for patients with a dual diagnosis [57-59], and that the TTM constructs are associated with physical activity in patients with schizophrenia spectrum disorders [60,61] and with drop-out from dialectical behavioural therapy for patients with borderline personality disorder [62]. A meta-analysis on the relations between stages of change and processes of change applied to psychotherapy, found that "the majority of published research concerns health behaviours and addictive disorders, as contrasted with the wide range of Axis I disorders" (p. 151)[63]. It appears that the TTM has been understudied regarding motivation for changing psychiatric problems in outpatient treatment for patients with SMI, despite its potential in this domain. Considering the above, the TTM was therefore chosen as one of the three theories for inclusion in the research of the current study. In Chapter 2 of this thesis, the TTM is described in more detail.

As mentioned previously, the Theory of Planned Behaviour is also one of the most widely used theories in health behaviour research. This theory proposes that motivation and behaviour results from a rational process of decision making. Key constructs are subjective norms, intentions to perform specific actions and perceived behavioural control. More recently, a derivative of the TPB was specifically developed by Drieschner and Boomsma[37] for application in forensic psychiatric care, called the Integral Model of treatment motivation[37] (IM). The IM revolves around six factors that predict the level of motivation to engage in treatment, namely problem recognition, distress, perceived legal pressure, perceived costs of treatment, perceived suitability of treatment, and outcome expectancy. The IM has a strong focus on individual beliefs, subjective norms and self-efficacy as the proximal predictors of motivation, similar to TPB. In IM, the level of motivation is considered to be predictive of subsequent treatment engagement. Although the IM was specifically developed as a model for treatment motivation in forensic psychiatric care, its framework may also be applicable to outpatients with severe mental illness. To evaluate its utility in this context, it was selected as one of the three theories to be investigated in the current thesis. Chapter 2 describes the IM in more detail.

Finally, Self-Determination Theory [64] (SDT) is a motivation theory that has gained much interest in the literature in the last two decades. SDT describes different types of motives or *reasons why* a person may engage in behaviour, that fall along a continuum of self-determination between intrinsic and extrinsic motivation [65]. To date, several studies have found support for the utility of SDT's motivational constructs in relation to cognitive and psychosocial functioning in patients with schizophrenia spectrum disorders [66-69]. For example, studies show that intrinsic motivation in schizophrenia spectrum disorders can change over time [66,68,70], predicts improvements in learning and psychosocial functioning [66,71,72], and mediates the relationship between negative and disorganized symptoms of schizophrenia and psychosocial functioning [69]. At the start of the current research project, no empirical studies had investigated the basic process model of SDT as applied to the treatment of patients with SMI, whereas the theory may be useful as a basis for

psychosocial interventions in this context [73,74]. It was therefore decided to incorporate SDT as the third theory to be investigated in the current thesis, and additionally, it was decided to use SDT as the basis for the development of a motivational intervention. Chapter 2 describes SDT in more detail and Chapter 3 describes how SDT was applied in the motivational intervention that was tested in a cluster-randomised controlled trial.

Outline of the thesis

As mentioned previously, Chapter 2 provides an overview of the three motivation theories that constitute the main focus of the research described in this thesis: Self-Determination Theory (SDT), the TransTheoretical Model (TTM) and the Integral Model of Treatment Motivation (IM). Central to Chapter 2 was to evaluate the main concepts, hypotheses, and the research that was available at the start of this project regarding the applications of each theory to the mental health care for patients with severe mental illness. At the end of Chapter 2, a research agenda regarding these theories is summarised, which was used as a guideline for the subsequent chapters and research described in this thesis. In Chapter 3, the research agenda from Chapter 2 is translated to a specific design and to specific methods. This chapter describes the rationale and details of the cluster-randomised controlled trial that was chosen as the overarching design. Specific research questions that are addressed in subsequent chapters are indicated below (see bullet points).

- *Can we assess the core constructs from the three motivation theories in a reliable and valid manner in outpatients with SMI?*
- *To which extent is each motivation theory applicable to outpatient treatment engagement in patients with SMI?*

As the testing of theories is founded on the proper assessment of theoretical constructs, the research described in this thesis was firstly focused on investigating the psychometric properties of questionnaires from the different theories. Chapters 4, 5, 6 and 7 report on psychometric properties of questionnaires from each motivation theory, while subsequently we investigate for each motivation theory how the theory-specific motivational constructs relate to the patient's treatment engagement, psychosocial functioning and quality of life. Chapters 5, 6 and 7 focus on testing SDT, IM and TTM, respectively. These chapters have in common that they focus on testing whether the process models as described by the originators of the theories are plausible in the reality of clinical practice for patients with SMI. It is tested whether the original models are robust across time and across patient diagnostic groups and it is investigated how much variation in treatment engagement and outcomes is explained.

- *Is Motivation Feedback – based on SDT – effective in improving treatment engagement and outcomes in outpatients with SMI?*

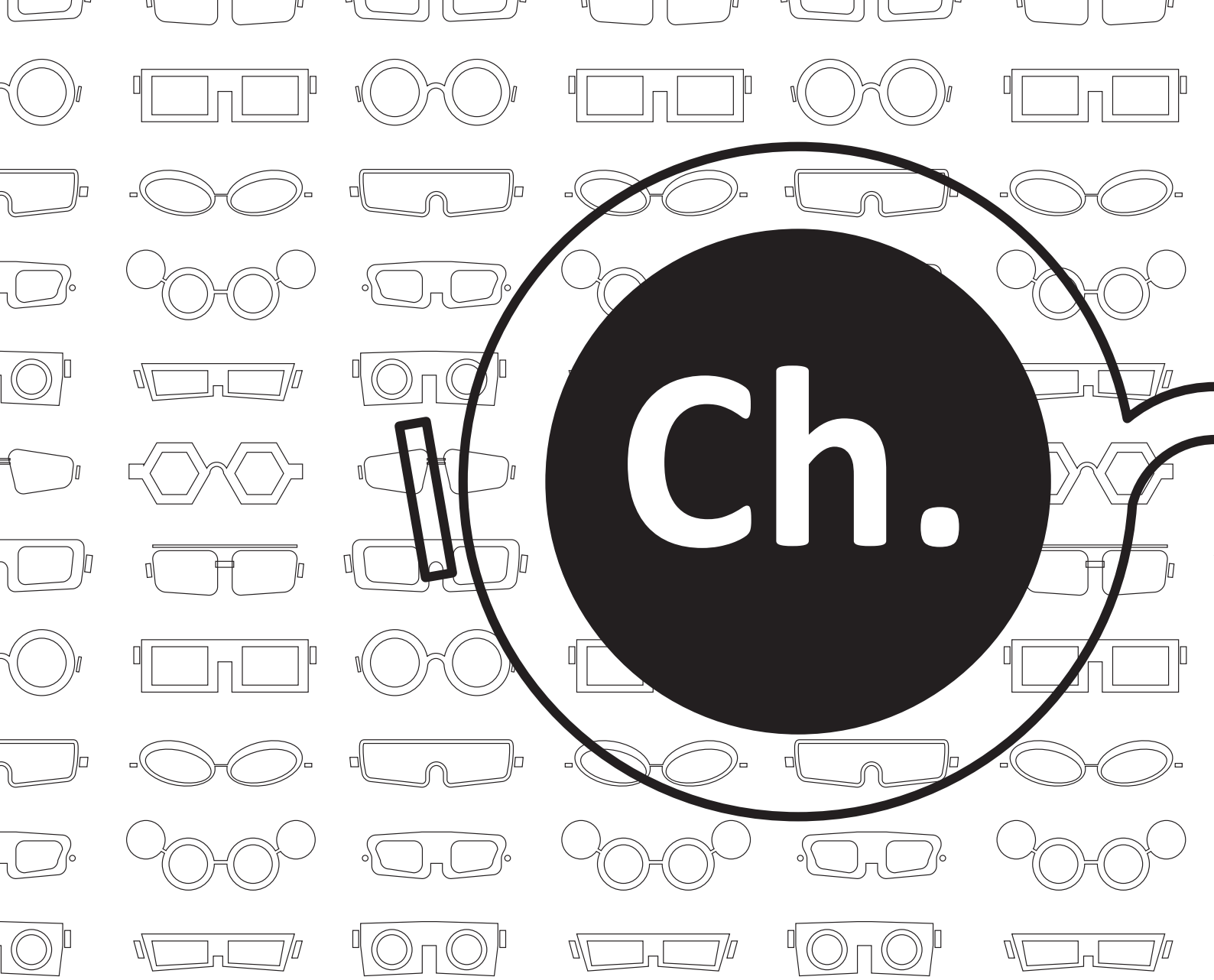
This question is addressed in Chapter 8, where the results of the cluster-randomised controlled trial (RCT) are reported. The primary aim of the trial was to test the effectiveness of a motivation feedback intervention based on SDT on treatment engagement and outcomes. Secondary, it is explored whether the effectiveness of the intervention is dependent on the type of disorder, namely whether there are differences in effectiveness between patients with primarily psychotic disorders versus those with primarily personality disorders.

- *To which extent are clinicians, who provide regular care to patients with SMI, able to estimate the patient's motivation for engaging in treatment? To which extent do clinicians and patients agree on the patient's motivation? Which factors are associated with estimation and agreement on treatment motivation?*

In a further attempt to understand differences between patients and clinicians on their reports on motivation, comparisons between patient-reported and clinician-reported motivation are addressed in Chapter 9. This chapter includes measures of all three motivation theories to explore whether the associations differ between the three theories, and which factors are associated with (dis)agreement on motivation between patients and clinicians.

- *Which motivation theory – or elements from these theories- provides the best explanation of treatment engagement and outcomes in outpatients with SMI?*
- *How do the three theories relate to each other (empirically)?*

Chapter 10 addresses the two final questions above. It provides a general discussion of the research findings described in the previous chapters and attempts to integrate the findings regarding the tests of the three motivation theories. This chapter reports on the contributions of this entire thesis to the understanding of motivation for engaging in treatment in outpatients with SMI. Implications for theory, research and practice are discussed.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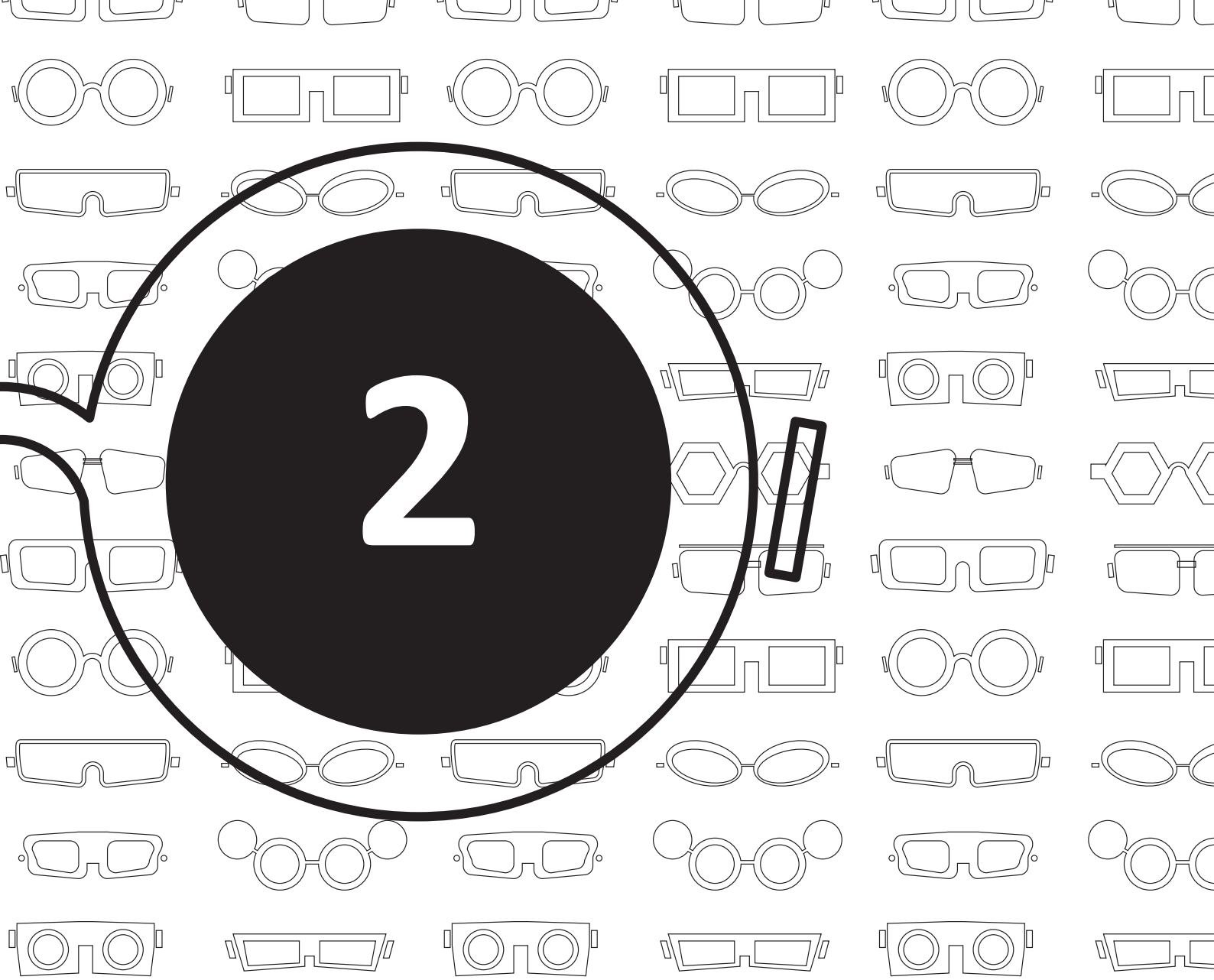
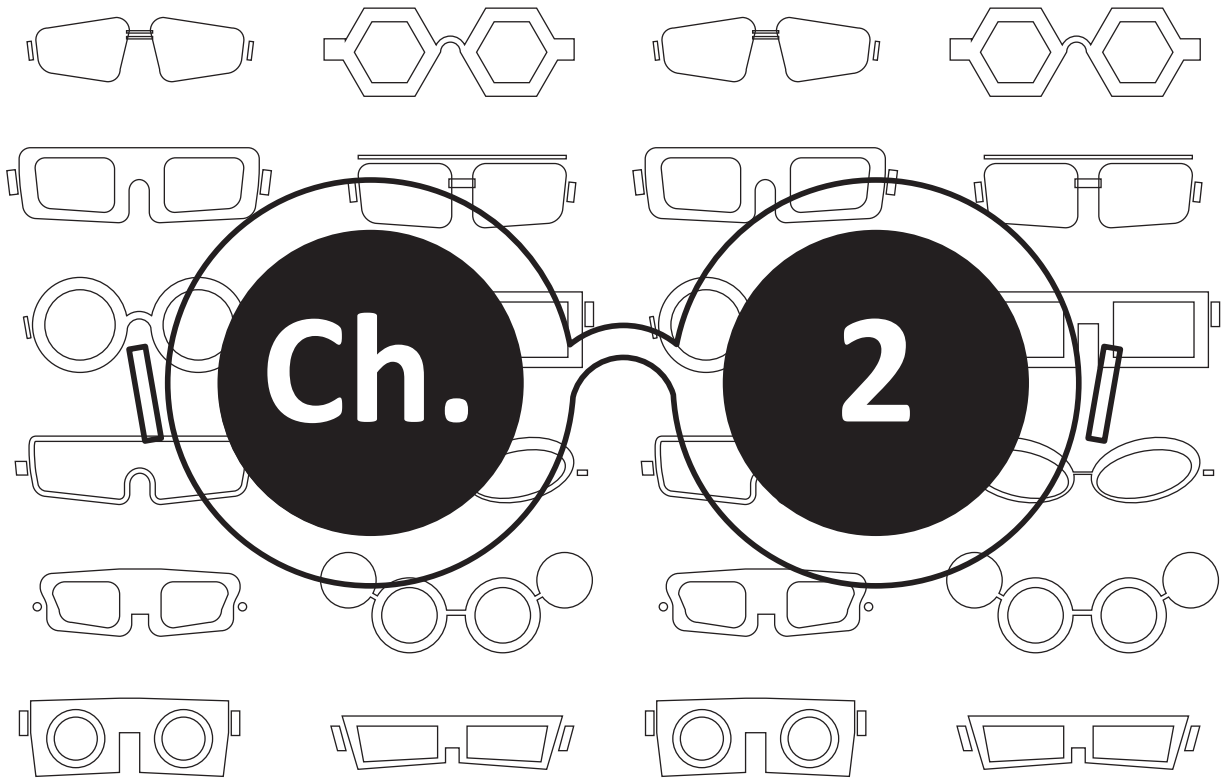


2

Three motivation theories

Jochems, E. C., Mulder, C. L., van Dam, A. & Duivenvoorden, H. J. 2011. A critical analysis of the utility and compatibility of motivation theories in psychiatric treatment. Current Psychiatry Reviews, 7, 298-312



Objective

The TransTheoretical Model (TTM), Self-Determination Theory (SDT), and the Integral Model of Treatment Motivation (IM) provide distinct but not incompatible conceptualisations of motivation. The utility of these theories as a basis for the improvement of psychiatric treatment engagement and treatment outcomes in patients with severe mental illness is evaluated.

Methods

The current study is a literature review that provides a qualitative overview of three motivation theories, including their empirical support for and challenges to application in psychiatric treatment for patients with severe mental illness.

Results

The TTM provides a temporal framework for motivation as represented by the stages of change, in which cognitive and behavioural components have been recognised while IM disentangles the determinants of motivation from its effects. SDT appears to differentiate itself from these two theories with its postulation of basic psychological needs that determine the development of specific types of motivation for particular behaviours. It appears that all three theories have gained support for their predictions of outcomes in patients with severe mental illness, but important questions remain unanswered, such as which of these theories provides the best prediction of treatment engagement and treatment outcomes. It is explained how these three theories could complete each other, based on their strong and unique assets. A model is presented to visualize possible interrelations that can be tested in future research.

Conclusion

It is imperative that the theories are empirically tested and compared to confirm their utility, and to this end we propose several important research questions that should be addressed in future research. Theory comparisons can advance what is currently known about intrapersonal changes and interpersonal differences in treatment engagement and outcomes in severely mentally ill patients.

Introduction

Although numerous theories of motivation and health behaviour exist today, it has been noted by several authors that real innovations and advances in understanding health behaviour have been quite modest [75,76]. One of the contributing factors to this lack of advancement in health behaviour theory is said to be that theories are seldom compared with each other in order to determine whether one theory offers a superior explanation of health outcomes than another theory [75-77]. Noar and Zimmerman [75] have further argued that this absence of empirical comparisons between different models, induces fragmented rather than accumulative knowledge regarding the prediction of (health) behaviour. The importance of empirically comparing theories is evident from the fact that we cannot truly know which theories are most accurate in explaining or predicting health behaviour if we do not test this. Clinicians faced with decision making regarding the optimal interventions should be able to rely on theory comparison studies that point out which theories (and accompanying intervention strategies) are best for which patients in which circumstances. We also agree with Noar and Zimmerman (2005) that: "The fact that theories have so many similar constructs demands that we (1) try and discover what the best conceptualization of those constructs is, and (2) compare theories to discover how these constructs combine and result in the enactment of health behaviour" (p.282).

The current chapter aims to provide an overview of three leading theories of motivation and conceptually relates these theories to each other in order to understand their common and unique contributions to the motivation concept. Also, the strengths and limitations of the theories are discussed in light of empirical evidence that these theories have gathered in their prediction and explanation of treatment engagement in patients with (severe) mental illness. This specific context was chosen since patients with severe mental illness (SMI) are generally considered problematic with regard to motivational issues and show high rates of drop-out and attrition from psychiatric treatment [24], which in turn has been shown to deteriorate treatment outcomes [23,28,29]. The current article serves to raise important research questions and critical thought with which we expect to stimulate research in testing and comparing these theories. First, we will explain how we arrived at the choice of these three specific theories before discussing the theories and how they relate to each other.

Three motivation theories

One of the most influential models of motivation and change, widely used in psychiatric treatment facilities and particularly in the treatment of addiction, is the Transtheoretical model (TTM) developed by Prochaska and DiClemente [44]. TTM has also been called the stages of change model, and is typically regarded as a model for motivation for change, as the motivation to engage in behaviour change increases with each progressive stage [37,52]. The TTM has frequently been used as a basis for the development of health behaviour interventions, especially in the field of addictions [55]. A fundamental assumption in TTM (or any stage model) is that matching interventions to specific stages will increase the likelihood that change will occur, as opposed to mismatching or not matching to stages. However, the TTM has been the subject of several conceptual and empirical critiques [37,78-80]. Interestingly, Drieschner et al. [37] have developed their own motivational model in response to the TTM, as these authors have criticised TTM (among other things) for its limited coverage of motivational factors. The model developed by Drieschner et al. [37] is called the Integral Model of Treatment Motivation (IM) and revolves around six so-called internal determinants that predict the level of motivation to engage in treatment. The IM has a strong focus on individual beliefs, subjective norms and self-efficacy as the proximal predictors of motivation, and the level of motivation would be predictive of subsequent behaviour (e.g. taking medication). The TTM and IM differ from each other, in that the TTM is a stage model while the IM is a continuous model, according to the typical classification by Weinstein, Rothman and Sutton [81]. Stage models assume that behaviour change takes place in discrete stages and that there is a different equation for every stage that predicts progression to the next stage. Hence, interventions based on stage models include different interventions for people in different stages. Continuous models on the other hand, focus on predictors (such as attitudes or motivation) of the patient's decision to perform certain health behaviours. Continuous models combine these predictors in a – often linear - prediction equation that places individuals along a continuum of behaviour likelihood. If one scores higher on either predictor in the equation then the likelihood of behaviour or behaviour change is also increased. The question now rises, which theories – stage or continuous - are most valuable in terms of their explanatory and predictive power regarding treatment engagement and treatment outcomes in patients with (severe) mental illness. The current

article will discuss the strengths and limitations of the TTM and IM as prototypical examples of these theory types, to see what contributions they have made to the prediction and explanation of treatment engagement and outcomes in patients with SMI.

Although the TTM and IM differ from each other with respect to the type of framework they are composed of, they appear to have in common that the focus is upon predicting the level of motivation. That is, both models employ a quantitative motivation concept where the motivation that an individual may hold can range from a low level/stage to higher levels or stages. Contrasting such a quantitative viewpoint would be a qualitative viewpoint, where motivation is not so much characterised by its level but by its underlying reasons for performing certain behaviour, or to put it in other words, by a type of motivation. One such theory is Self Determination Theory (SDT) [48,64], a theory that has gained much interest in the literature in the last two decades. SDT postulates different types of motivation, where a central distinction is made between autonomous (i.e. self-determined) motivation and controlled (i.e. externally determined) motivation. Specifically, SDT predicts that autonomous motivation leads to a higher quality of treatment engagement (that is, self-determined treatment engagement) and as a consequence, to a better maintenance of healthy behaviour and more well-being [82]. Furthermore, controlled motivation would be related to a poorer quality of treatment engagement and as a consequence, to poorer maintenance and well-being [82]. It should be noted however, that although SDT is primarily concerned with the quality of motivation, it is also concerned with the quantification of motivation across the self-determination continuum. Amotivation stands at one end of the self-determination continuum, characterised by the lowest intentions for action, whereas motivation stands at the other end of the continuum, characterised by clear intentions for action, whether they are extrinsic or intrinsic. The addition of SDT as a theory to compare to TTM and IM leads to a second question concerning whether the level of motivation or the type of motivation (or a combination of these) is most important for the prediction of treatment engagement and clinical outcomes. This is another issue that will be addressed in the current article.

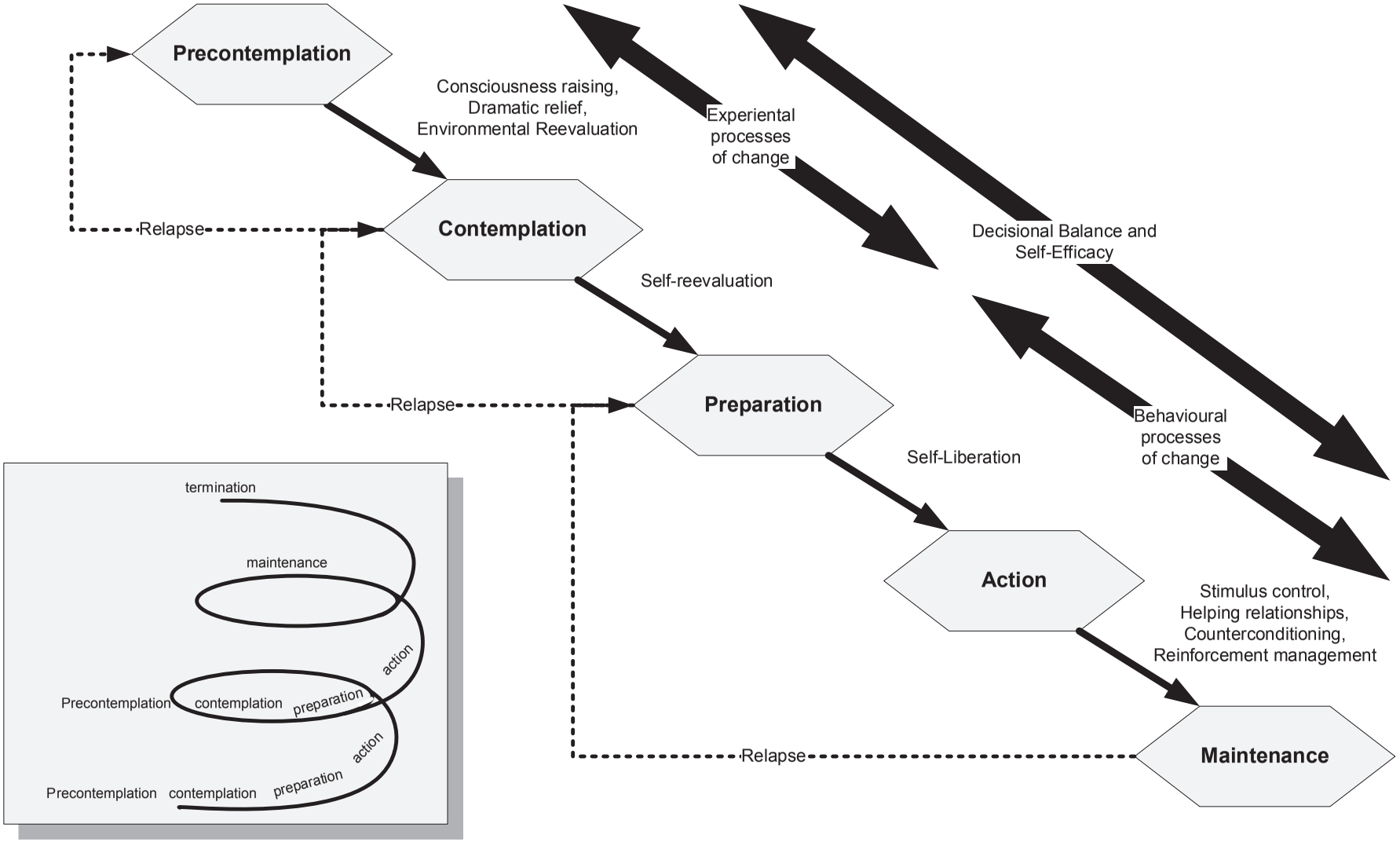
Thus, we have now arrived at the selection of the following three theories for our discussion: the TransTheoretical Model [44], the Integral Model of treatment motivation [37] and Self-Determination Theory [64]. These models, their definitions and measurements of the motivation concept and the way in which they predict treatment engagement and treatment outcomes will be described.

Transtheoretical Model (TTM)

TTM describes how individuals pass along five stages towards behaviour change [44,55,83,84]. These stages are known as precontemplation, contemplation, preparation, action and maintenance. Precontemplation is the stage at which the individual has no intention to change his behaviour in the foreseeable future, usually defined as the next 6 months [84]. In this stage, patients are unaware of their problems or avoid reading or thinking about their problems. They are therefore considered unmotivated to change at this stage. Contemplation is the stage in which the individual is aware that a problem exists and is seriously thinking about overcoming it over the next six months, but has not yet made a commitment to take action [84]. An important aspect of the contemplation stage is the weighing of the pros and cons of the problem and the solution to the problem. Moving on to the preparation stage, individuals in this stage intend to take action in the next month [84]. Then, in the action stage, the individual modifies his behaviour, experiences, or environment in order to overcome his problems in the preceding six months. Maintenance is regarded as the stage in which the individual works to prevent relapse and consolidate the gains attained during action [84]. Maintenance is considered a continuation of change that extends from six months to an indeterminate period (although estimated to about five years) past the initial action [84]. Interestingly, within each of the five different stages specific problems may occur, depending on specific situations and disorders. For example, patients who suffer from schizophrenia often have impaired insight into their illness [85] which might prevent them from progressing from precontemplation towards the contemplation stage. Figure 1 shows the stages of change and their relations with other constructs in TTM.

According to TTM, individuals progress through the stages sequentially, but relapsing and recycling through the stages is common [55]. Figure 1 shows three possible relapse moments between the stages. Due to the explicit notion of relapsing and recycling, it has been argued that TTM has been successful in promoting a less pejorative view of people who are not ready for change and that the model has heuristic appeal [79]. TTM describes how fourteen constructs, including two decisional balance constructs, two self-efficacy constructs and ten processes of change determine transitions between the stages [83,87]. These ten processes of change can be

Figure 1. TransTheoretical Model, adapted from Prochaska et al. [55] and Prochaska [84]



Note: This figure is depicted differently in our original published paper[86] , but was presented here in the manner consistent with Chapter 7 of this thesis.

divided into two categories: experiential processes and behavioural processes. Experiential processes include activities related to thinking about the health behaviour change (e.g. consciousness raising, self-re-evaluation, environmental re-evaluation), while behavioural processes are categories of behaviours that are supposed to be helpful for the achievement of the behaviour change (e.g. stimulus control, reinforcement management) [44]. Prochaska et al. [54] have argued that the ten processes of change are "like independent variables that people need to apply to move from stage to stage" (p.63). However, several problems with both the stages of change and processes of change have been noted [88-90], as we shall discuss in the following.

Definition and measurement of the constructs in the TTM

A basic and substantial problem with the TTM is the way in which the stages of change are defined and measured. Several measures have been developed to assess the stages of change, including categorical stage assignments based on stage algorithms [55] and continuous measures (e.g. the Readiness to Change Questionnaire (RCQ) [91] the University of Rhode Island Change and Assessment (URICA) Scale [38], Motivation for Treatment Questionnaire [92]). Continuous measures have the advantage that they have been shown to have relatively good agreement between different scales and between clients and clinicians [93], but a disadvantage is that they do not provide a representation of all five stages of the model. For example, the RCQ only distinguishes between the precontemplation, contemplation and action stages, while the URICA incorporates these three and the maintenance stage but not the preparation stage. The URICA has been modified into the URICA-M to suit the needs of people with SMI [57]. The URICA-M contains the same four subscales as the URICA, but includes reading items aloud to accommodate individuals who cannot read, modified language to make it simpler and includes only 24 items [57]. Overall, in a sample of patients with SMI and co-occurring substance use all subscales of the URICA-M showed good reliability (i.e. $\alpha = .72$ or higher), except for the maintenance subscale that showed moderate reliability ($\alpha = .67$ to $\alpha = .70$). When reanalysed within diagnostic and substance use groups, the results suggested that the URICA-M was more reliable for schizophrenia and substance dependent groups than for non-psychotic affective groups and substance remitted groups [57]. It appears that, compared to other TTM measures (e.g. of the processes of change, self-efficacy and decisional balance) that were also studied by Nidecker et al. [57], the URICA-M showed inferior reliability, especially for patients with affective disorders and those in remission . Furthermore, a disadvantage that remains with the URICA-M (and other continuous measures of the stages) is that participants can endorse items representing at least two different, sometimes nonadjacent stages. If participants turn out to be in multiple stages at the same time however, the validity of discrete stages is called into question [79,90].

Where most continuous measures for the stages of change do not represent all five stages of the model, algorithms enable placing individuals in either of five stages and have been used extensively in diverse populations and research areas [55,87,93]. The algorithm approach involves a series of questions that ask about attempts and intentions to change behaviour within certain time frames that correspond to a particular stage. A disadvantage of most of the staging algorithms, as pointed out by Sutton [88], is that the time periods are arbitrary and in some cases, the staging algorithms are logically unsound. Using different time periods would lead to a different stage allocation and a different stage attribution [88]. Furthermore, studies have shown low concordance between these different stage measures [88] and in different studies, there have been inconsistencies in the definitions of the stages [89]. Obviously, the practical utility of the TTM is called into question if the stages cannot be assessed readily. Some authors have even argued that the problems with the TTM are so serious that the theory should be discarded entirely [78] or that the model should not be regarded as a descriptive model but as a prescriptive model – a model of ideal change [90]. However, supporters of the model favour its practical utility and argue that the shortcomings of the TTM still pale in comparison to other models that have traditionally excluded unmotivated individuals, whereas TTM has been dedicated to specifically also include unmotivated individuals who need the most help [94].

Furthermore, the TTM does not appear to differentiate between the determinants of motivation and the motivation concept itself, for which it has been criticised [37]. Drieschner et al. [37] have interpreted the stages of change within TTM not as temporally ordered levels of a single dimension (motivation to engage in the process of behaviour change) but instead argue that the stages conceptually encompass two underlying components. The first consists of the cognitive determinants of motivation to change and the second consists of behaviour that results from a certain level of treatment motivation. In his criticism upon the TTM, Sutton [88] has also noted this, and he states

that the stages of precontemplation, contemplation and preparation may be seen as the "planned time to action" (p.176). Looking at the TTM this way, the level of motivation to engage in treatment then rises as one moves from the precontemplation stage to the preparation stage, and leads to actual behaviour changes from the action stage onwards.

Other constructs of the TTM, such as the decisional balance constructs and self-efficacy constructs, are typically measured with Likert scales that ask patients about the relative importance given to pros and cons when making the decision to engage in the relevant health behaviour and how they judge their own capacity to perform certain behaviour. A decisional balance scale has also been constructed [95]. For the assessment of the processes of change, the Processes of Change Inventory was developed for individuals trying to quit smoking [96]. A revised processes of change inventory (a shortened version of the original 40-item scale) has been validated in a sample of SMI patients with co-occurring substance disorder [57]. However, the processes of change remain the least studied dimension of the TTM. This is rather strange, since the processes of change represent a core assumption of TTM: that movement between stages is predicted by the use of the processes of change. Besides the little empirical attention that the processes of change have been given, there are other problems. For example, some of the processes seem more like procedures than processes (e.g. stimulus control) [89] and Dunlap [97] has noted that although TTM establishes the processes of change as important variables that facilitate stage movement, it does not clarify how the processes are initiated or once activated, how they can be stimulated further.

Prediction of treatment engagement and outcomes

The different stages of change are hypothesised to predict treatment engagement, dropout, efficacy and long-term maintenance of behaviour changes [83,98]. More specifically, the amount of progress that patients make following treatment is predicted to be a function of their pretreatment stage of change [55], where patients in lower stages (i.e. precontemplation and contemplation) would make least progress and show higher rates of dropout. Additionally, the processes of change would predict transitions between stages, where the experiental processes should be employed in the early stages to progress to higher stages, and behavioural processes should be endorsed in the action and maintenance stages of change.

It has been noted that the available longitudinal evidence for TTM's prediction of change is mixed at best [79,89]. Studies have shown inconsistencies as to which stage predicts drop-out or behaviour change. In a comprehensive review of the stages of change model (not the entire TTM), Littell and Girvin [79] concluded that there was "scant evidence of sequential movement through discrete stages in studies of specific problem behaviours, such as smoking and substance abuse" (p.223). On the other hand, it has been noted by Hutchison, Breckon and Johnston [99] that "the majority of interventions reported to be based on the TTM fail to accurately represent all dimensions of the model. Therefore, until interventions are developed to accurately represent the TTM, the efficacy of these approaches and the appropriateness of the underpinning theoretical model cannot be determined" (p.829). Furthermore, few prospective studies have been conducted to investigate the TTM constructs in patients with severe mental illness. In a study by Rogers et al. [100] it was examined how baseline stages of change scores were prospectively related to retention in a vocational intervention with patients with SMI. At three months, none of the stages were significantly related to retention, and at six months only the contemplation stage was a significant predictor of better retention while at nine months again none of the stages had predictive value [100]. A study by Pantalon and Swanson [101] showed that, contrary to TTM's predictions, dually diagnosed patients in lower stages of change (measured with the URICA) had greater treatment adherence one month after discharge from hospital than patients in higher stages, in that they attended a greater proportion of therapy groups and clinical appointments. Also, patients in lower stages were more likely to attend all of their scheduled appointments than those in higher stages [101]. Cross-sectional studies have also shown inconsistent findings with respect to the validity and utility of the TTM stages of change (e.g., [60,102-104]). Since it has been shown that the TTM constructs can be reliably measured in patients with SMI (and co-occuring substance use disorders) [57,105,106], researchers should now aim to (prospectively) investigate the utility and validity of TTM in patients with SMI.

Intervention strategies and evidence for these strategies

Being a stage model, the TTM implies that interventions should be matched to the stage a patient is in. Project MATCH (Matching Alcoholism Treatment to Client Heterogeneity) was a large multisite clinical trial designed to test the matching hypothesis [107]. One of the three treatment arms in this trial, called Motivational Enhancement Therapy,

was grounded in the TTM [108]. Of the 16 hypotheses tested in Project MATCH, only one hypothesis was statistically significant: that clients with few psychiatric symptoms would respond better to Twelve-Step facilitation than Cognitive Behavioural Coping Skills Therapy [109]. These negative findings leave us to wonder whether matching patients to stage-specific interventions is worth the effort. However, in a re-examination of the motivation matching hypothesis support was found for the matching hypothesis in the outpatient sample, where individuals with lower baseline motivation had better outcomes if assigned to Motivational Enhancement Therapy compared to those in Cognitive Behavioural Coping Skills Therapy [110]. Overall, evidence for the matching hypothesis and prospective power of TTM is mixed [80,111,112] and it is still unclear how the matching hypothesis applies to patients with SMI. Furthermore, regarding the use of the TTM in clinical practice, it has been noted by Patterson, Wolf & Buckingham [113] that: "working with the stages of change seems to require the dedicated attention to that central, one and only, specifically identified problem. (…) The individual and therapist then, have one problem and five different stages to monitor. The multiple challenged clients however, could have up to five equally serious problems to address (i.e. housing, employment, alcohol or drug use, medical conditions, and criminal justice). This would require monitoring five co-evolving problems with five different TTM stages" (p.54). This would be almost impossible to achieve, since the therapist would then have to keep track of five problems and five stages per problem, resulting in 25 possible interventions. It would thus seem that stage-based interventions are less suited for individuals with SMI – a population that almost by definition faces multiple problems. As Littell and Girvin [79] have noted: "Stage-matched interventions seem premature and ill advised. A more realistic approach is taken by Miller and Tonigan (1996), who provided clients with feedback on their SOCRATES scores as a starting point for discussion about their motivation for change" (p. 255).

Integral Model of treatment motivation (IM)

The Integral model of treatment motivation (IM) was developed by Drieschner et al. [37] in an attempt to disentangle the determining factors and behavioural consequences of the concept of treatment motivation. The IM defines treatment motivation as "the patient's motivation to engage in their treatment (MET)" ([37], p. 1130). According to the authors, the proximal predictors of the level of MET are six cognitive and emotional factors, called internal determinants of MET. The IM and related concepts is shown in Figure 2. The six internal determinants include problem recognition, level of suffering, perceived external pressure, perceived costs of treatment, perceived suitability of treatment, and outcome expectancy [37]. It is indeed plausible that a distressed patient who recognises his problems, has a high level of perceived legal pressure, combined with optimism about the effect of treatment will have a higher level of MET than a patient with lower levels on these factors. According to IM, the internal determinants mediate the influence of external factors (such as the type of treatment and demographic features) on MET. As the internal determinants are expected to determine the MET, MET in turn would determine the level of treatment engagement. However, the authors argue that this association is not perfect, since patients may lack the cognitive or neuropsychological capacity to do what the treatment requires [37]. Finally, treatment engagement would determine treatment outcome, along with other factors (i.e. external determinants) such as the treatment effectiveness and the persistence of the patients' problems [37].

The IM seems psychologically plausible in that it leaves room for external factors to influence the relation between MET and TE. Indeed, studies have shown that the association between motivation and behaviour is imperfect [114,115]. The authors of IM themselves found that self-reported MET by patients explained 32 percent of the variance of subsequent therapist-rated treatment engagement [116]. Although this percentage compares favourably to values found in other fields of research, it still leaves a large percentage of the variance in treatment engagement to be explained by other factors. The IM is not clear about which exact factors – apart from cognitive functioning – are needed to 'bridge the gap' between MET and TE. It could be an improvement on IM to add intermediary factors between the level of motivation and the actual treatment engagement. Although including such factors will not increase the size of the effect of motivation upon behaviour, it will generally improve the prediction of the behaviour [115] and thus create opportunities to beneficially influence the pathway to behaviour change and maintenance.

Definition and measurement of the constructs in the IM

Two instruments have been developed to specifically measure the constructs in the IM: the Treatment Motivation Scales for Forensic Outpatient Treatment (TMS-F) to measure the internal determinants and the

Figure 2. The Integral Model of treatment motivation and related concepts, adapted from Drieschner et al. [117]

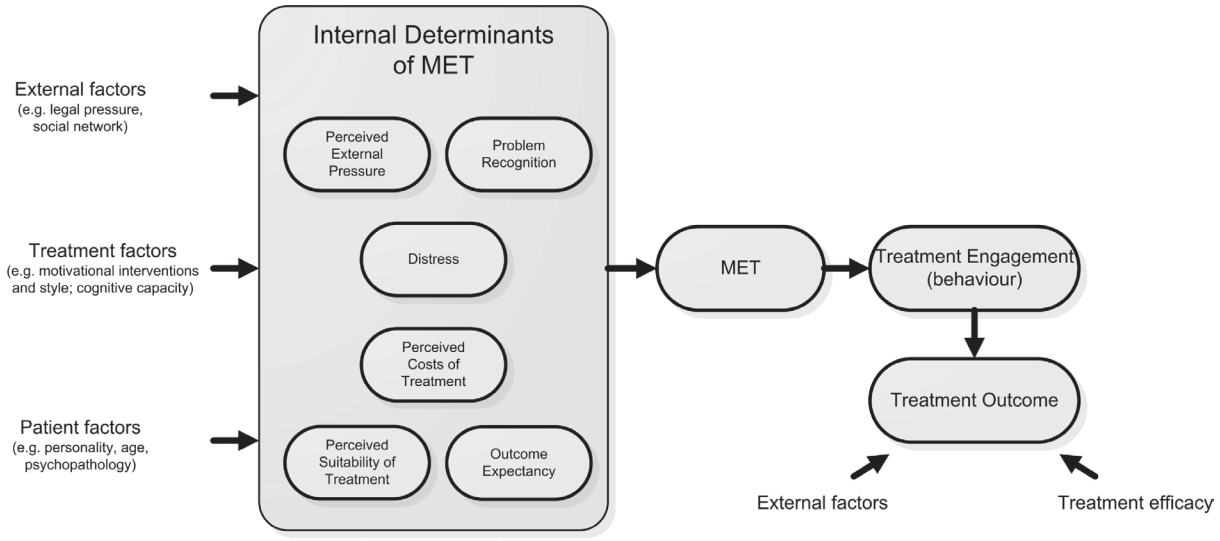
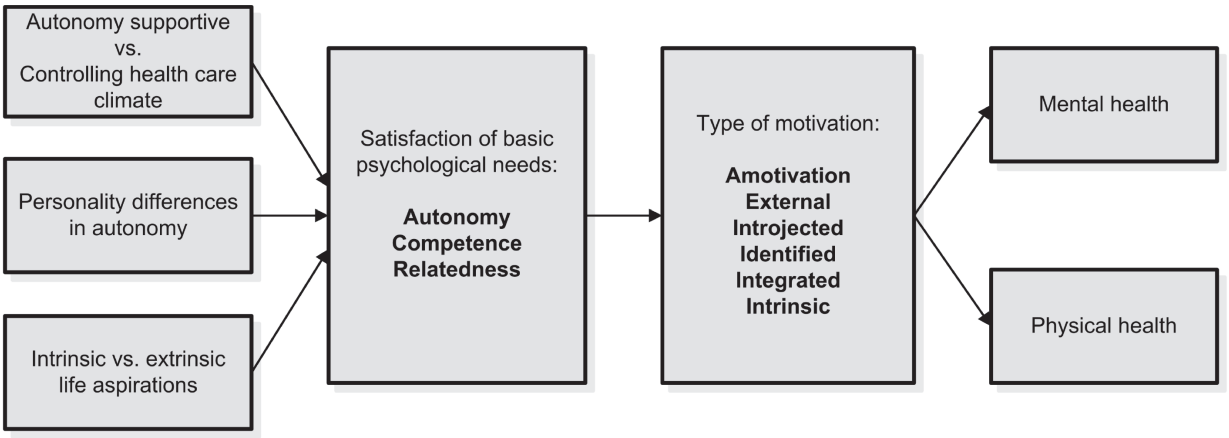


Figure 3. Self-Determination Theory, adapted from Deci and Ryan [48] and Ryan, Patrick, Deci and Williams [123]



level of motivation, and the Treatment Engagement Rating Scale (TER). The patient population in which the theory and its measures were tested consisted of individuals with psychiatric and personality problems being treated in a correctional outpatient treatment facility. In several studies with this population, the measurement instruments were found to be reliable and valid [116,118,119]. Although the sample in which the instruments were validated was a heterogeneous one (e.g. 70% had a axis I DSM-IV diagnosis of which 8% had a psychotic disorder, and 80% has substantial characteristics of personality disorders) it remains to be determined whether the TMS-f and TER are also reliable and valid instruments for use in samples of patients with SMI, not necessarily being offenders.

Prediction of treatment engagement and outcomes

In the IM, motivation is regarded as the outcome of the combined effects of the internal determinants and it can therefore vary in amount, depending on the values of the internal determinants. According to IM, a higher motivation for treatment induces higher treatment engagement and, as a result, a better treatment outcome. In several studies in forensic psychiatric outpatient centres, Drieschner et al. [116,118,119] have generally found support for the theory that the internal determinants predict the MET which in turn predicts treatment engagement. Outcome expectancy was found to be the best predictor of MET and also predicts engagement in an important degree, albeit indirectly [116]. Furthermore, treatment engagement was found to predict treatment completion and treatment outcome [117]. These findings seem to support the predictions of the Integral Model of the relations between the internal determinants, MET, treatment engagement and treatment outcome. However, there were also some findings that were not in line with IM. For example, treatment engagement was best predicted by the MET scale and by the subscale of Perception of the Suitability of the Treatment, while subscales for Distress and the Perceived Legal Pressure were found virtually unrelated to MET and treatment engagement [116]. Also, the perceived suitability of the treatment was found to predict the treatment engagement directly, beyond the mediated effect of MET. These findings indicate that the patient's appraisal of the treatment is most important for treatment motivation and treatment engagement, while problem recognition, distress and perceived legal pressure are not so much. Actually, as we shall see later on, these findings seem to fall in line with SDT's postulation that when an individual reports motives that are more internalised (such as perceiving the treatment as suitable) this is more predictive of treatment engagement than external motives (such as legal pressure). It appears that the IM is at least partially supported, but more research is needed to clarify the relationships between the core constructs of the IM since the overall empirical attention that the IM has been given is still very modest. As mentioned before, the IM was developed and tested in forensic psychiatric patients indicating the need for further testing in other patient populations.

Intervention strategies and evidence for these strategies

As the IM is a continuous model with multiple determinants forming the basis for the level of motivation, interventions based on this model would include influencing these determinants. Drieschner and Verschuur [117] have argued that most of the internal determinants can be influenced by interventions such as motivational interviewing and its derivative motivational enhancement therapy, a general motivational style or by adherence to the responsivity principle (i.e. adapting the treatment to a patient's learning style, cultural background and cognitive capacity). The authors of IM have not proposed their own specific intervention based on the theory, so evidence for the efficacy of IM-compatible interventions comes indirectly. For example, motivational interviewing has been shown to be an effective intervention across different health behaviours, including alcohol, drugs and exercise [120]. At the moment, it is unclear whether motivational interviewing should be supported to use in treatments of individuals with severe mental illness or those with a dual diagnosis since evidence from randomised trials is inconsistent [121,122].

Self-Determination Theory (SDT)

Self-Determination Theory (SDT) was developed by Deci and Ryan [48]. SDT poses that all humans are naturally active organisms, focused on growing, mastering challenges and integrating new experiences into a coherent sense of self [48,64]. The social context is seen as a crucial influence upon the direction of this growth; it can either support it or hinder/stop it. According to SDT, this interplay between the active human and the social context determines behaviour and development. More specifically, SDT uses the concept of basic psychological needs for autonomy, competence and relatedness as the core ingredients for a healthy physical and mental development. If these basic psychological needs are not met, certain types of psychopathology may develop [82]. Figure 3 visualises how SDT is modelled.

According to SDT, autonomous motivation may vary from intrinsic motivation to types of extrinsic motivation in which people have identified with the value of a change and have integrated this change into their sense of self [82]. SDT poses that autonomously motivated people experience greater ownership of the behaviour and feel less conflict about behaving in accord with regulations and external demands. For example, an individual who remains in a programme or treatment because he feels that following the treatment itself is exciting and pleasant (e.g. in a physical exercise programme), would be an autonomously motivated client. Obviously not many clients, if any, will present with such a motivation for psychiatric treatment, as treatment is usually followed with the goal of finding relief of symptoms or resolving problems and is usually not considered to be pleasant in itself. In contrast, controlled motivation consists of external regulation, in which behaviour is regulated by external rewards or punishments. When people have a controlled motivation, they experience pressure to behave in particular ways. SDT then differentiates four types of extrinsic motivation: external regulation, introjected regulation, identified regulation and integrated regulation. External regulation, in which people engage in an activity out of social pressure or to obtain an external reward or avoid punishment, is the least self-determined form of extrinsic motivation. In this case, the patient following psychiatric treatment would be motivated to remain in treatment because he feels pressured by others to do so (e.g. they advised him to do so). Next, introjected motivation is a more self-integrated form of extrinsic motivation. Instead of being motivated by external contingencies and forces, a person who behaves due to introjected motivations is driven by internal drives such as feelings of guilt, shame, and anxiety. A patient with such a drive would feel disappointed in himself or ashamed if he would not remain in treatment. SDT states that these motivational forces still remain external to person's self, because the individual does not fully endorse them. Moving further along the continuum, identified motivation is the third form of extrinsic motivation, in which the individual recognises and accepts the underlying value of certain behaviour. As Deci and Ryan [48] state it: "By identifying with a behaviour's value, people have more fully internalized its regulation; they have more fully accepted it as their own"(p.236). The resulting behaviour would be more autonomous, although still instrumental rather than integrated into the individual's sense of self. Finally, the most complete form of internalisation of extrinsic motivation is integrated motivation. Integrated motivation not only involves identifying with the importance of the behaviour, but is also about integrating those identifications with other aspects of the self. A separate category of motivation exists for people who experience no regulation at all (neither external nor internal) over their behaviour, and therefore lack any intention to behave in a certain way. This state is called amotivation. In this case, the patient is likely to reject or drop out from treatment soon. According to SDT, amotivation may be caused by a lack of self-efficacy and an external locus of control [48].

Theoretically, SDT is appealing because of its addition of a qualitative aspect to the motivation concept. The differentiation between different types of motivation, especially different types of extrinsic motivation, could prove beneficial and relevant for use in a context of patients with motivational issues such as those with SMI. To know not only the level of motivation of the patient but also the reasons behind it, could help clinicians to better guide patients towards resolutions of possible motivational conflicts while moving towards the desired behaviour change. However, as we shall discuss in the following, SDT has not (yet) been able to produce a measure that can assess all six types of motivation to engage in treatment.

Definition and measurement of the constructs in SDT

Within SDT, different constructs are operationalised by different measures. A separate scale was developed to study motivation for entering psychiatric treatment. This scale, called the Treatment Motivation Questionnaire (TMQ), has been studied in patients with alcohol addiction [35], in a study of people attending a methadone clinic [124] and among people with severe and persistent mental illness [125]. In this latter study, adult patients with a psychotic disorder or with a major mood disorder with psychotic features were assessed with an adapted version of the original TMQ. The original TMQ consists of 26 items reflecting four theoretical constructs: intrinsic motivation, extrinsic motivation, help-seeking and confidence in success of treatment. In the adapted version of the TMQ for the population of people with SMI, a five-factor solution was found in which an additional introjected motivation subscale was identified [125]. This version of the TMQ still provided support for the SDT framework in which external motivation was found to be an overarching construct comprising several sub-dimensions of emotion regulators (i.e. external motivation and introjected motivation). Furthermore, Wild, Cunningham and Ryan [126] have developed the Treatment Entry Questionnaire (TEQ) for patients in

addiction treatment. The TEQ is an adapted version of the TMQ, including more items to be able to more clearly discriminate between identified, introjected and external motives for treatment. The TEQ formed internally consistent dimensions for external (α = .89), introjected (α = .89) and identified motivation (α = .85). As mentioned previously, a disadvantage of using the TMQ or TEQ is that it does not assess all six types of motivation. Also, the TMQ and TEQ have thus far not become commonly used with any population and studies supporting the use of these questionnaires come primarily from the same source, the people who have developed SDT [127]. Although the TMQ appears to be a valid measure to use in a population of patients with SMI [125], it is unclear whether this is also the case for the extended version (the TEQ).

Prediction of treatment engagement and outcomes

According to SDT, the more internal (i.e. autonomous) perceived cause of a person's behaviour, the more likely the person is to persist in this behavioural activity, and in case of treatment, to adhere to a therapeutic regimen. Conversely, the more external perceived cause of behaviour, or the more a person's reasons for entering treatment are based on external regulators (controlled motivation), the less persistence and adherence are expected. Several studies have supported these predictions from SDT, although only few studies have been conducted among patients with (severe) mental illness. A study by Zuroff et al. [128] showed that autonomous motivation was a stronger predictor of outcome in depressed outpatients than therapeutic alliance, predicting higher probability of achieving remission and lower posttreatment depression scores across three different treatments (interpersonal therapy, cognitive-behavioural therapy and pharmacotherapy with clinical management). Also, patients who reported their therapists as more autonomy supportive also reported higher levels of autonomous motivation [128]. A study by Pelletier, Tusson and Haddad [129] showed that the more autonomous patients were in their motivation for psychotherapy, the more satisfied they were with treatment, the greater their intention to persist and the lower their level of depressive symptoms. In contrast, controlled motivation was related to tension, and negatively predicted the importance of therapy and intention to persist [129]. Another study showed that higher need satisfaction for autonomy was related to improved outcomes in group psychotherapy for anxious and depressed patients, and this relation was presumably mediated by more treatment engagement and a reduction in negative thinking induced by cognitive behavioural therapy [130]. In a study with patients entering addiction treatment, Wild et al. [126] showed that external motivation was positively correlated with legal referral and social network pressures, while identified motivation was positively correlated with self-referral. Furthermore, it appeared that identified motivation predicted attempts to reduce drinking and drug use, more strongly than external motivation. Since patients with (severe) mental illness frequently have a co-occuring substance use disorder [58], these findings from SDT show promise for its use in this population.

However, empirical evidence is still scarce, largely cross-sectional and the use of SDT within psychotherapy has mainly been promoted by the theorists (e.g. by Ryan & Deci [65]). Furthermore, two studies have produced results that were not predicted by SDT. In a study by Ryan et al. [35] among patients with alcohol dependence, results revealed an interaction effect between internalised and external motivations, indicating that those with both high internal and high external reasons were most likely to persist in treatment. Another study replicated this in a methadone treatment programme, where it was found that external motivation accompanied by internal motivation may aid recovery of addiction [124]. This interaction between internal and external motivation is a finding that was not predicted by SDT, since the theory holds that external motivation would be related to less persistent engagement and poorer health outcomes. In fact, these results might be better explained by a quantitative motivation theory such as IM, where a higher level of motivation (i.e. a combination of high external and internal motives) is related to better outcomes.

Intervention strategies and evidence for these strategies

SDT holds that social contexts that support satisfaction of the basic psychological needs facilitate the internalisation of extrinsic motivations [48]. That is, the social environment can facilitate satisfaction of the basic needs of autonomy, competence and relatedness by providing autonomy support, structure, and involvement, respectively. For example, competence is facilitated when patients are helped to develop clear and realistic expectations and goals about behaviour change, they are encouraged to believe that they are capable of engaging in appropriate behaviours, and are given positive feedback regarding their progress [82]. However, providing support for only one basic need such as competence is insufficient to promote internalisation of motivation [48]. A motivationally supportive environment provides

support for autonomy, competence as well as relatedness [48]. The need for autonomy is supported when patients are helped to develop a personally meaningful rationale for engaging in behaviour, by minimising external controls and contingencies upon the behaviour, by providing opportunities for active participation and choice and by acknowledging negative feelings associated with engaging in appropriate behaviour that is difficult to accomplish [131]. In SDT the role of relatedness and involvement has received less attention than autonomy and competence, but involvement describes the extent to which patients perceive that significant others are genuinely interested in them and their well–being, understand the difficulties they are facing, and are emotionally supportive [48].

Several studies have found support for SDT's prediction that perceived autonomy support facilitates the development of more autonomous motives for change [124,132-136]. However, of the randomised controlled trials that have been conducted to investigate this hypothesis from

Table 1. Evaluation criteria applied to the three motivation theories in the context of psychiatric treatment motivation, showing their strong (+) and weak/not sufficiently determined (-) points

Criterion	Description	TTM	IM	SDT
Clarity	Has well-defined terms that are operationalised and explicit and internally consistent. Explicit propositions are preferred.	+ Explicit terms are operationalised - Debate about the operationalisation of the stages of change - Propositions regarding processes of change not always clear (e.g. are they mediators or moderators?)	+ Explicit terms are operationalised - Unclear proposition about role of 'external factors'	+ Explicit terms and propositions - Not all terms operationalised (e.g. all types of motivation) - No proposition for the combination of high autonomous and high external motivation
Consistency	The components do not contradict each other. There is fit between concepts, propositions and clinical exemplars.	+ Good fit between concepts and clinical exemplars	+ Good fit between concepts and propositions	+ Good fit between concepts and propositions
Parsimony	Explains the phenomenon in the least complex manner possible.	+ Separate constructs easy to understand - Complex model with many interrelations between constructs	+ Distinction between determinants and consequences of motivation - Large number of determinants	+ Simple model, easy to understand
Testable	The propositions can be tested, with the potential to be falsifiable or refuted.	+	+	+
Empirical validity	The theoretical claims are congruent with evidence.	+ Many studies have been done across different life domains - Mixed evidence is found - Little research has been done in populations of patients with SMI	+ Predictive power confirmed in forensic psychiatric patients - Few amount of studies - No research has been done outside forensic setting	+ Many studies have been done across different life domains - Little research has been done in populations of patients with SMI
Productivity	Reveals new phenomenon or relations among those already known. Generates new questions and ideas and adds to the knowledge base.	+ Generates new ideas and has added to knowledge base + Heuristic value	- Small addition to knowledge base (relatively new theory)	+ Generates new ideas and has added to knowledge base
Generalisable	Generalises to other situations, places and times. Extends far beyond particular observations and laws that it was designed to explain.	+ Applied to broad range of behaviours (e.g. smoking, diet, exercise, condom use, drug abuse)	- Specific theory about motivation for psychiatric treatment	+ Applied to broad range of behaviours (e.g. parenting, education, exercise, work, health)
Integration	A set of constructs are combined in systematic and meaningful patterns, first conceptually, then empirically, and ideally mathematically.	+ Meaningful conceptualisation + The initial model was adjusted to empirical evidence + Strong and weak principle (mathematical pattern) - Empirical pattern of processes of change less clear	+ Meaningful conceptualisation + The initial model was adjusted to empirical evidence - No mathematical principle	+ Meaningful conceptualisation + The initial model was adjusted to empirical evidence - No mathematical principle
Utility	Provides service and is useable.	+ One of the most widely used and influential models	+ Provides service to specific population - Few empirical tests	+ Utility has increased the last two decades
Practical	A theory-based intervention is demonstrated to have significant efficacy, producing greater behaviour change than a placebo or control.	+ Appeals to clinicians and is most commonly used theory across a broad range of behaviours - Mixed evidence is found - No evidence for practical use in patients with SMI	- Theory does not imply a specific intervention	+ Theory-based intervention efficacious for tobacco dependence, physical activity and dental hygiene - No evidence for practical use in patients with SMI

SDT, none have so far focused upon patients with (severe) mental illness. Therefore, SDT is in need of prospective investigations and randomised trials to see whether the theory's predictions hold for this population.

Critical reflection upon the three theories

Table 1 shows the most common evaluation criteria that are used to evaluate the quality of theories, which we adapted from Prochaska, Wright and Velicer [137]. Several points that are noted in this table should be explained. For example, although all three theories have clear and well-defined concepts, the TTM and SDT have issues pertaining to the operationalisation of constructs (i.e. how the stages of change should be measured and that not all motivational types are present in current measures, respectively) and some of the propositions of the IM and TTM are unclear. All three theories are productive and provide ideas that generate research. For example, TTM provides a temporal framework for motivation as represented by the stages of change, whereby engaging in the processes of change would predict stage movements. The IM disentangles the determinants of motivation from its effects (different from TTM) and views motivation as a primarily quantitative concept (similar to TTM). Finally, SDT appears to differentiate itself from these two theories with its postulation of basic psychological needs that determine the development of specific types of motivation (amotivation, external, introjected, identified, integrated and intrinsic motivation) which in turn predict treatment engagement and outcomes. All models are testable but as far as empirical tests of the theories have been conducted among individuals with SMI, it appears that the findings show mixed evidence for the theories' predictive and explanatory strengths.

Taking these critical points together, it is difficult to conclude which theory is overall currently superior to the other theories in the context of psychiatric treatment motivation and engagement. For TTM, long-standing issues pertaining to the measurement and distinctiveness of the stages of change and the relatively little empirical attention that has been dedicated to the processes of change currently appear to stand in the way of theoretical advancement for this theory. Also, empirical support for the hypothesis that matching interventions to specific TTM stages is beneficial appears to be lacking [79,108,111] and application of stage-matched interventions to patients with SMI thus seems premature. The IM has only been studied in a forensic psychiatric setting and although these findings show promise for its application in other populations, the current value for patients with SMI is unknown. Regarding SDT, the scarce empirical evidence that is available regarding patients with mental illness shows general support for the theory, but no longitudinal studies have yet been conducted among patients with SMI indicating the need for further investigations.

The question whether a continuous model (i.e. IM or SDT) or a stage-based theory (i.e. TTM) is most valuable to use as a basis for the improvement of treatment engagement and treatment outcomes in patients with (severe) mental illness appears to fall in favour of continuous models, although it should be noted that all three theories have been scarcely investigated among individuals with SMI. Littell and Girvin [79] have argued that: "Although a stage model may have greater intuitive appeal, a continuous model of readiness for change is more parsimonious and may be more easily integrated with related concepts from other theories. (…) A continuous model may fit the data better than a stage model, although continuous measures of readiness for change have not yet been thoroughly tested" (p. 253).

The question whether a quantitative approach or qualitative approach to motivation is superior for the prediction of treatment engagement remains to be answered, since all three theories have thus far shown mixed findings. For example, we have shown that research findings that were not well predicted by IM could be explained by SDT and vice versa. One study by Vansteenkiste et al. [138] has readily addressed the question of quantity versus quality of motivation in a sample of high school and college students, to see which approach best predicted optimal learning patterns. Four motivation profiles were constructed from a SDT perspective: a good quality motivation group (i.e., high autonomous, low controlled); a poor quality motivation group (i.e., low autonomous, high controlled); a low quantity motivation group (i.e., low autonomous, low controlled); and a high quantity motivation group (i.e., high autonomous, high controlled). The authors compared predictions from qualitative and quantitative perspectives on motivation and found that compared with the other profiles, the good quality motivation group showed the most optimal learning pattern [138]. Such an approach adapted to motivation for treatment in patients with (severe) mental illness could shed more light on the qualitative versus quantitative debate with respect to the prediction of treatment engagement and outcomes.

In the following, we intend to relate the three theories to each other, in order to further

Table 2. Comparing core constructs across the three motivation theories

Concept	Integral Model of treatment motivation	TransTheoretical Model	Self-Determination Theory
Attitudinal beliefs			
Appraisal of the positive and negative aspects of the behaviour and expected outcome of the behaviour	Outcome expectancy and perceived costs of treatment (internal determinant)	Pros and cons (decisional balance)	-
Problem recognition; awareness about one's problem behaviour	Problem recognition (internal determinant)	Consciousness raising (experiential process of change)	-
Beliefs about the efficacy of the treatment	Perceived suitability of treatment	-	-
Self-efficacy beliefs			
Belief in one's ability to perform the behaviour; confidence	Self-efficacy (as a part of outcome expectancy within the internal determinants)	Self-efficacy	Perceived competence*
Reinforcements and environmental influences			
External contingencies	Perceived external pressure (internal determinant)	Reinforcement management (behavioural processes of change)	External regulation (type of regulation)
Support and responses of others	Social network (external determinant)	Helping relationships (behavioural process of change) Environmental reevaluation and social liberation (processes of change)	Environment that is supportive of autonomy, competence and relatedness
Emotional responses			
Experiencing negative emotions due to the problem behaviour and coping with these emotions	Distress (internal determinant)	Dramatic relief and Self-re-evaluation (experiential process of change)	Introjected regulation (type of regulation)
Motivation			
Not intending to perform the behaviour, not making commitments to change	Low motivation to engage in treatment	Precontemplation (stages of change)	Amotivation
Intending to or planning to perform the behaviour; setting goals or making a commitment to perform the behaviour	High motivation to engage in treatment	Contemplation/preparation (stages of change) and self-liberation (behavioural process of change)	High extrinsic and high intrinsic motivation**
Behaviour			
Performing the healthy behaviour; engaging in treatment	Treatment engagement	Action (stages of change)	(Non-)Self-determined treatment engagement ***
Outcome			
Long-term outcome of the behaviour	Treatment outcome	Maintenance and termination (stages of change)	Treatment outcome

Variable names in parentheses indicate that the variable(s) above it are part of that larger category, according to the theory

* SDT maintains that the self-efficacy theory view stands in contrast to the need for competence, which implies that the experience of competence in and of itself is a source of satisfaction and a contributor to well-being over and above any satisfaction resulting from the outcomes that competence might yield.

** SDT states that when the source of motivation is external, the behaviour resulting from this type of motivation will show poor transfer once contingencies and external pressure are withdrawn.

*** SDT states that the more self-determined the behaviour (e.g. treatment engagement) the better the maintenance of this behaviour will be, while non-selfdetermined behaviour is associated with poor maintenance.

disentangle their common and unique contributions to the motivation concept. In doing so, we hope to demonstrate that the theories are generally compatible with each other and can be studied simultaneously to address relevant research questions.

Compatibility of constructs within the theories

The core constructs of the TTM, IM and SDT can be disentangled into seven common domains: (1) attitudinal beliefs, (2) self efficacy beliefs, (3) reinforcements and environmental influences, (4) emotional responses, (5) motivation, (6) behaviour and (7) outcome. These domains have been summarised in Table 2 where similar constructs across the theories are compared in the rows. For example, when the decisional balance construct of TTM is specifically applied to psychiatric treatment engagement, where patients evaluate whether or not to engage in their treatment, decisional balance is comparable to the constructs called 'perceived costs of treatment' and 'outcome expectancy' in IM, since they are concerned with appraisal of the positive

and negative aspects of treatment engagement. Furthermore, it appears that self-efficacy, broadly defined as the belief that one is capable or competent in achieving desirable behaviour, is incorporated in all three theories albeit in different ways. For example, SDT holds that self-efficacy needs to be combined with a sense of autonomy in order to achieve the most positive outcomes [48] whereas the IM and TTM do not appear to make such a distinction.

Also interesting is that within SDT, a distinction is made between short-term and long-term effects of reinforcements. According to SDT, reinforcements facilitate external motivation which may lead to short-term behaviour change but will show poor maintenance and transfer once contingencies and external pressure are withdrawn. SDT states that rewards and threats undermine autonomy and thus lead to decreased intrinsic motivation and more negative outcomes [48]. Contrasting this is the view of TTM, where reinforcement management would predict movement from the action to the maintenance stage. Thus, interventions based on TTM would include rewarding the patient for making beneficial changes and stimulate the patient to reward himself for making changes. Interventions based on SDT would not include reinforcements as these external regulations are often experienced as controlling one's behaviour [139] and are counterproductive for the development of intrinsic motivation, leading to poor maintenance of the behaviour change. Interestingly, DiClemente (1999) has noted that intrinsic and extrinsic motivation types differ with regard to their long-term outcomes and that: "personal pros and cons are more important than external incentives in the long run. Sustained change must be reinforced by incentives that are owned by the individual, so that they become integrated into the life of that individual" (p.211). Nevertheless, this insight has not yet established itself in the form of an adaptation of TTM. It appears that both TTM and IM expect that the level of motivation will increase when strategies such as rewards (reinforcements) and threats (legal pressure) are applied, whereas SDT predicts differential effects on the type of motivation (and subsequent behaviour) that will result from these strategies. These different predictions call for empirical tests, as do other research questions regarding the three theories (summarised in Table 3).

Compatibility of the three theories

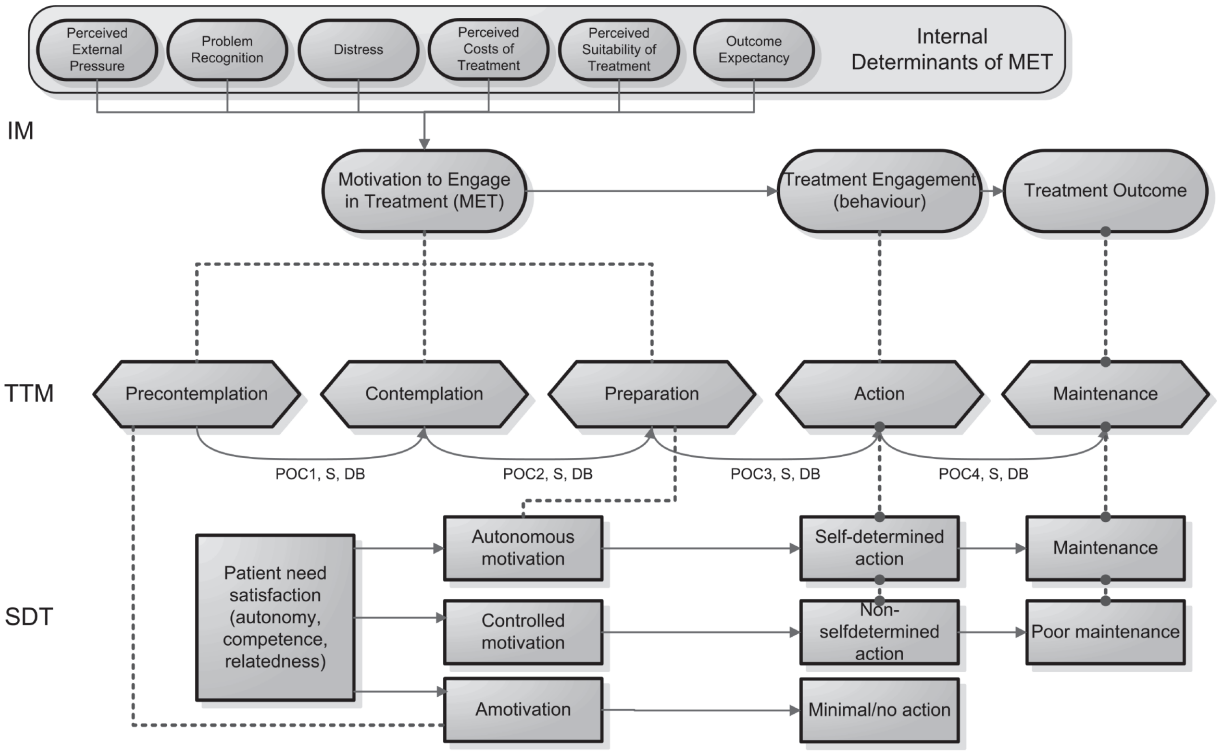
In Figure 4, we have visualised how all three models might relate to each other. To start at the top of the figure with the IM, this model clearly distinguishes the determining factors of motivation to engage in treatment (MET) from its manifestation into behaviour. This way, the model provides reasons as to why an individual has a certain level of motivation for treatment. TTM does not incorporate the determinants of allocations to certain stages, although based on the descriptions of stages one could extract some. Rather, TTM describes when individuals change by engaging in change processes. It could be argued that at a conceptual level, moving from precontemplation through contemplation to preparation in TTM, the level of MET in the IM increases as we come closer to the actual action (active manifestation of the behaviour). For example, a low level of MET might correspond with either the precontemplation or contemplation phase, where patients are unwilling or not ready to engage in behaviour change, but have been thinking about it. Also, a high level of MET could correspond with later stages such as the preparation or action stage.

In SDT, the motivation concept revolves primarily around the type of motivation. This conceptualisation of motivation is clearly distinct from the other models. Nevertheless, some authors have hypothesised links between SDT and TTM and have proposed SDT's internalisation process to be associated with stage movement within TTM (e.g. Dunlap [97], Kennedy & Gregoire [127], Vansteenkiste, Soenens and Vandereycken [140] and Abblett [141]). Vansteenkiste et al. [140] have argued that TTM seems compatible with the concept of internalisation of change and thus with the idea of the types of motivation within SDT. However, from an SDT perspective the critical question would not be to which extent patients find themselves in a certain stage, but why they are in that stage. There is some preliminary evidence that as internalisation increases, so does the individual's advancement along the TTM stages[142]. For example, it has been found that people entering drug abuse treatment with high levels of internal motivation were more likely to be in the action stage than people with high levels of external motivation [127]. In another study, it was found that the use of more identified and intrinsic forms of behaviour regulation distinguished those in action and maintenance stages from those in contemplation and preparation stages [143]. These findings suggest that the level of internalisation differs for people in different stages of change, where amotivated or externally regulated individuals might be more prevalent in the precontemplation stage, whereas individuals who have an integrated form of motivation might be more prevalent in action and maintenance stages. In Figure 4, this relationship between the models is represented by the dotted lines between the precontemplation phase in TTM and amotivation in SDT, and the dotted line between

Table 3. Possible research questions pertaining to TTM, IM and SDT in the context of psychiatric treatment for patients with severe mental illness

Theory	Research questions
TTM	Do stage algorithms or continuous measures of the stages of change provide better prediction of treatment engagement and outcomes? Do the processes of change predict stage transitions for patients with SMI? Do SMI patients in psychiatric treatment in lower stages show higher rates of drop-out than patients in higher stages?
IM	Are the TMS-f and TER valid and reliable measures in patients with SMI? What factors, apart from the level of motivation to engage in treatment, are predictive of actual treatment engagement in patients with SMI? Does the level of motivation to engage in treatment have predictive value for treatment engagement and outcome in patients with SMI?
SDT	Is it possible to distinguish the six types of motivation as postulated by SDT? Is the TEQ a valid and reliable measure for patients with SMI? Do the motivational types from SDT have predictive value regarding treatment engagement and treatment outcomes in patients with SMI? Does the support of the basic psychological needs predict internalisation of motivation in patients with SMI?
Theory comparisons	Does the stage-based TTM or the continuum-based IM provide better prediction of treatment engagement and outcomes in patients with SMI? Does a quantitative approach to motivation provide better prediction of treatment engagement than a qualitative approach? Is there a difference between self-efficacy (TTM and IM) and perceived competence (SDT)? Are similar constructs from the different theories (see table 2) actually identical? Is reinforcement management predictive of the quantity and quality of motivation? Is reinforcement management predictive of long-term treatment engagement and outcomes? Are the relations between the three theories as proposed by figure 4 in this article supported by empirical evidence? For example; - Is the level of MET (IM) related to the stages of change (TTM)? - Is the level of treatment engagement (IM) related to stages of change (TTM)? - Is SDT's internalisation process related to the stages of change (TTM)? - Are the internal determinants (IM) related to different motivational types (SDT)?

Figure 4. Visualisation of the three motivation theories and their potential interrelations



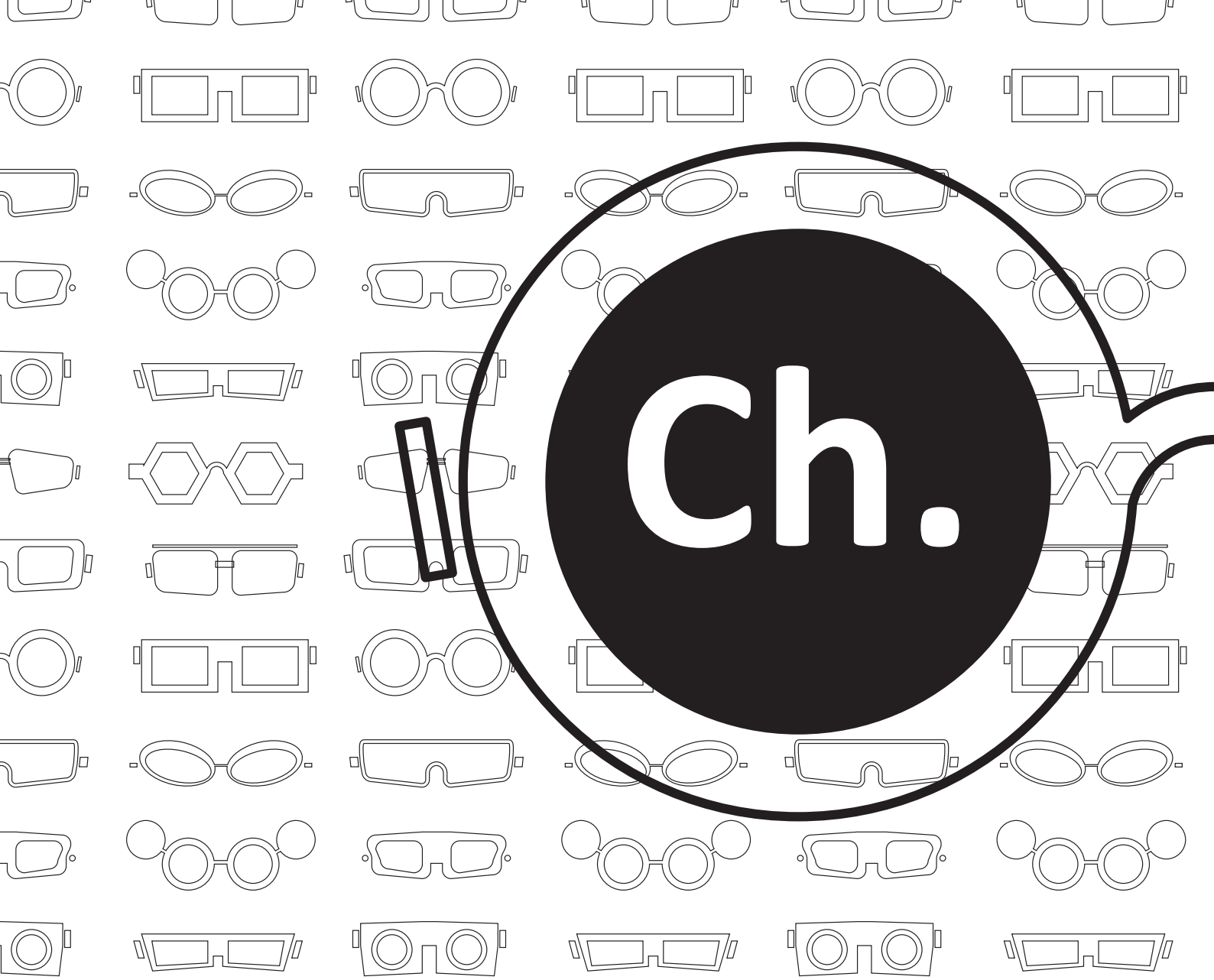
IM: Integral Model; TTM: TransTheoretical Model; POC1: Processes of change (consciousness raising, dramatic relief); POC2: Processes of change (self-reevaluation); POC3: Processes of change (self-liberation); POC4: Processes of change (reinforcement management, helping relationships, counterconditioning, stimulus control); S: Self-efficacy; DB: Decisional Balance; SDT: Self Determination Theory.

the preparation stage and intrinsic motivation, respectively. Abblett [141] describes SDT as providing the molecular mechanisms of how motivation is created, and TTM as providing an infrastructure for understanding the processes of change. Also, where in the IM and TTM it seems relatively important that a person engages in treatment, in SDT it is important how (self-determined) a person engages in his/her treatment. Some interesting research questions pertaining to these three theories and their interrelations are presented in Table 3. It should be noted that Noar and Zimmerman [75] have also suggested important theory comparison questions which could be applied to these three theories.

Conclusion

The TTM, IM and SDT provide distinct, but in our view compatible conceptualisations of treatment motivation. The TTM provides a temporal framework for motivation as represented by the stages of change, in which cognitive and behavioural components have been recognised [37,88] while IM disentangles the determinants of motivation from its effects. SDT appears to differentiate itself from these two theories with its postulation of basic psychological needs that determine the development of specific types of motivation for particular behaviours. The theories include several common theoretical constructs such as self-efficacy and reinforcement strategies, but sometimes predict different effects of these constructs upon treatment engagement and outcomes. For example, although all three theories acknowledge that reinforcement strategies have an effect upon motivation and treatment engagement, TTM and IM predict that reinforcements lead to a higher level of treatment motivation and better maintenance of the desired behaviour, while SDT holds that reinforcements undermine the development of more autonomous motivation and thus ultimately to poor maintenance of the desired behaviour.

At present it remains unclear which theory is most effective in predicting behaviour change and maintenance, and also which theory is best suited for use within clinical practice. Future research should focus upon empirical comparisons of these (and other) theories, in order to aid optimal decision making on which theories are most plausible and most useful for clinical practice. A comparison of theories is a complex challenge, but several authors have reflected upon this and provided guidelines [75-77,144]. To reduce patient burden, comparable constructs from different theories could be assessed with a single measure. For example, this could apply to the decisional balance constructs and problem recognition, and possibly also for the patients perception of external pressures and social relations. The unique aspects of the theories ask for theory-specific measures, such as the stages of change within TTM, perceived suitability of treatment within IM, and different motivational types within SDT. To conclude, it is of particular interest to design and conduct theory comparison studies among subgroups of patients, such as those with severe mental illness, to advance what is currently known about how well the TTM, IM and SDT account for intrapersonal changes and interpersonal differences in treatment engagement and treatment outcome. In turn, this could aid in the development of effective interventions to improve treatment retention and outcome.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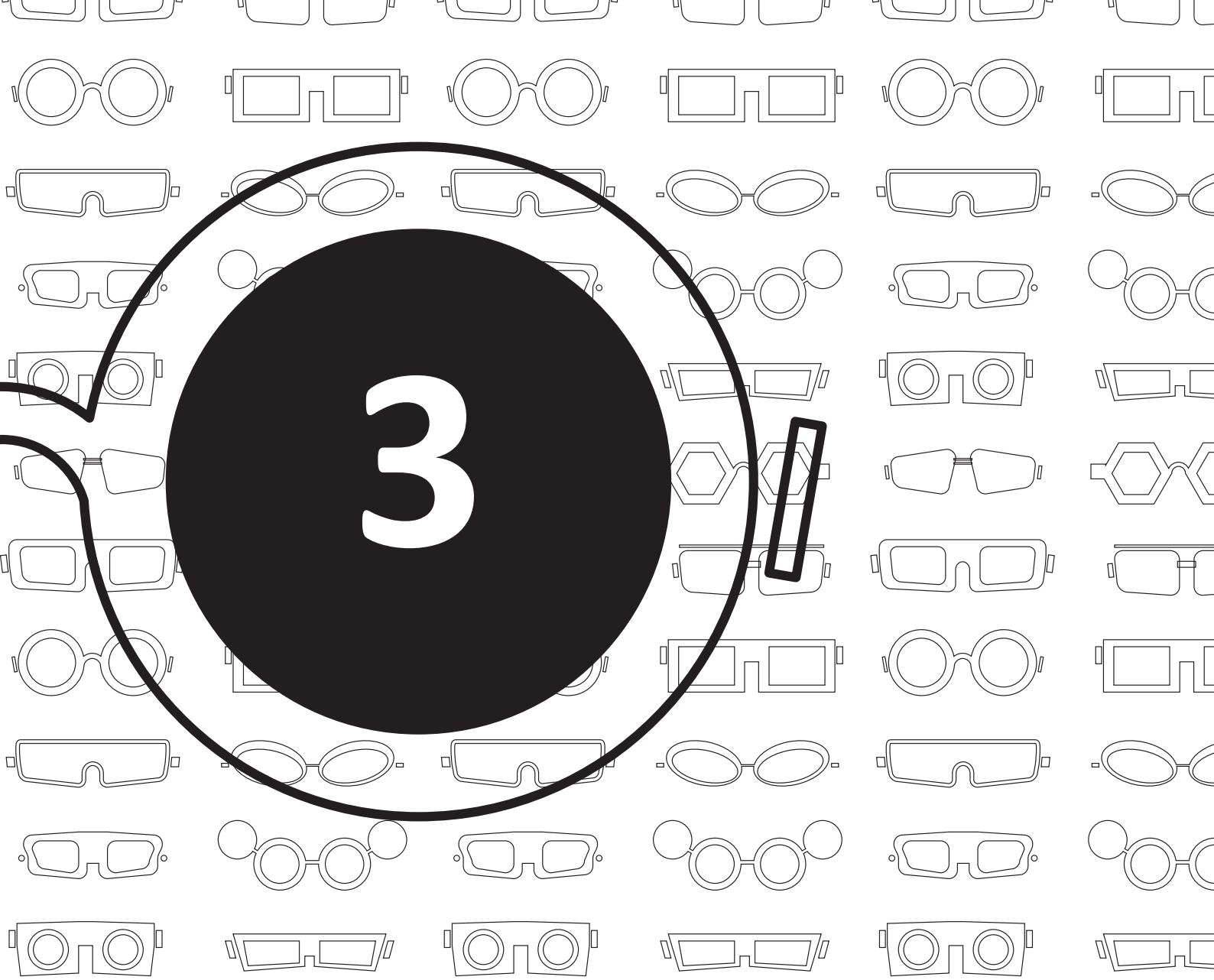
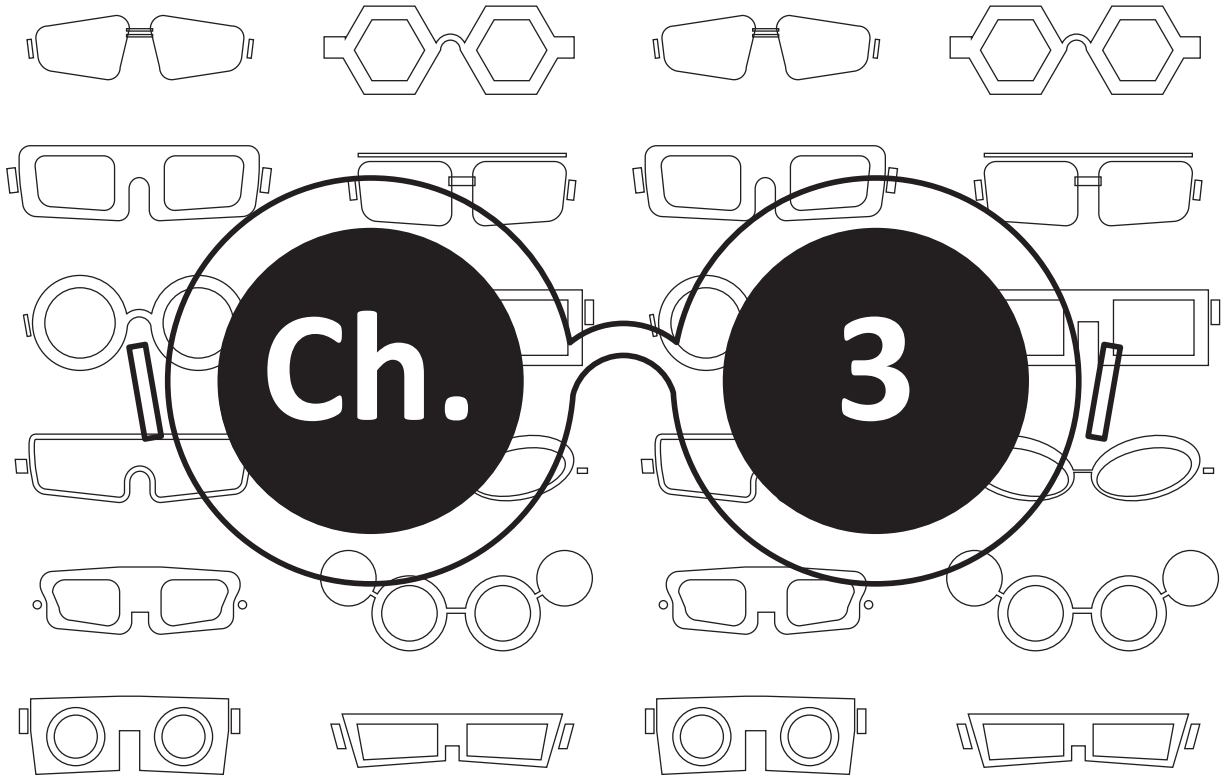


3

Design, Methods and Procedures

Jochems, E. C., Mulder, C. L., van Dam, A., Duivenvoorden, H. J., Scheffer, S. C., van der Spek, W. & van der Feltz-Cornelis, C. M. 2012. Motivation and treatment engagement intervention trial (MotivaTe-IT): the effects of motivation feedback to clinicians on treatment engagement in patients with severe mental illness. BMC Psychiatry, 12, 209



Objective

This chapter describes the study protocol for a cluster randomized controlled trial that serves three purposes: 1) to determine whether a feedback intervention based on the patients' motivation for treatment is effective at improving treatment engagement (TE) of severe mentally ill patients in outpatient psychiatric treatment, 2) to gather insight into motivational processes and possible mechanisms regarding treatment motivation (TM) and TE in this patient population and 3) to determine which of three theories of motivation is most plausible for the dynamics of TM and TE in this population.

Methods

The Motivation and Treatment Engagement Intervention Trial (MotivaTe-IT) is a multi-center cluster randomized trial investigating the effectiveness of feedback generated by clinicians regarding their patients' treatment motivation upon the patients' TE. The primary outcome is the patients' TE. Secondary outcomes are TM, psychosocial functioning and quality of life. Patients whose clinicians generate monthly motivation feedback (additional to treatment as usual) will be compared to patients who receive treatment as usual. An estimated 350 patients, aged 18 to 65 years, with psychotic disorders and/or severe personality disorders will be recruited from outpatient community mental health care. The randomization will be performed by a computerized randomization program, with an allocation ratio of 1:1 (team vs. team or clinician vs. clinician) and patients, but not clinicians, will be blind to treatment allocation at baseline assessment. Due to the nature of the trial, follow-up assessment can not be blinded.

Conclusion

The current study can provide important insights regarding motivational processes and the way in which motivation influences the treatment engagement and clinical outcomes. The identification of possible mechanisms through which changes in the outcomes occur, offers a tool for the development of more effective future interventions to improve TM and TE.

Trial registration: Current Controlled Trials NTR2968

Introduction

This chapter describes the study protocol for the Motivation and Treatment Engagement Intervention Trial (MotivaTe-IT). MotivaTe-IT serves two purposes: 1) to determine whether a feedback intervention based on the patients' motivation for treatment is effective at improving treatment engagement (TE) of severe mentally ill patients in outpatient psychiatric treatment, and 2) to gather insight into motivational processes and possible mechanisms regarding motivation for treatment and treatment engagement in this patient population. In the following, we will describe why we chose to use motivation feedback as the intervention in this study.

Motivation feedback intervention

Studies employing feedback to clinicians have shown that monitoring and informing clinicians of their patients' treatment progress in psychotherapy is effective in enhancing retention and outcome [145-150]. Providing systematic feedback can be seen as an addition to regular treatment and may guide changes, prolongation or termination of treatment. It ensures that the attempts to resolve the problems can be evaluated, and if necessary, adjusted [151]. In several studies by Lambert et al. [145,146,148] in a psychotherapy setting, progress feedback was based upon four domains of functioning, including psychological disturbance (mainly depression and anxiety), interpersonal problems, social role functioning and quality of life [149]. The effects of feedback were most pronounced in patients who showed a poor initial response to treatment [147]. Feedback is also increasingly being researched in other settings. In a study in patients with psychotic disorders in a community mental health setting, patients were asked to rate their quality of life and satisfaction with treatment, which was fed back to clinicians and discussed [152].When compared to control patients (who did not make use of feedback) after 12 months, patients in the feedback condition reported better quality of life, fewer unmet care needs and higher satisfaction with treatment. However, the groups showed no statistically significant difference on psychopathology scores (i.e. positive, negative or general symptoms of schizophrenia). In another study conducted among SMI patients receiving community care, where clinicians received feedback on their patients' care needs, a significant improvement was found in patient satisfaction, but not on psychopathology, social functioning and quality of life [153] when compared to controls. A study conducted in the Netherlands among patients with severe mental illness, found that systematic monitoring of patients' care needs in combination with feedback provision was associated with global improvement in depression and anxiety symptoms, but not with improvement in manic excitement and positive symptoms [154]. It seems that structured feedback has positive effects on some central outcomes of community mental health care (e.g. quality of life and patient satisfaction) but not on others (e.g. level of symptoms or functioning), depending on the setting and the content of the feedback. In a study by Whipple et al. [148] a more extensive form of feedback was used when compared to the Lambert et al. studies [145,146], where the authors found that using clinical support tools (CSTs) additional to feedback upon the client's progress resulted in clients staying in therapy longer, and that these clients were twice as likely to show superior outcomes. These CSTs incorporated measures to assess the therapeutic relationship, the motivation to change and the social support network. These results line up with other studies about feedback to clinicians and point out that the use of support tools is of additional value [148]. However, a limitation of Whipple's study was that it was not possible to determine the effects of the individual components (e.g. motivation to change) in the CSTs upon outcome. Some studies have compared the effects of personalized feedback with the effects of motivational interviewing including personalized feedback, and found that feedback only is less effective than motivational interviewing with feedback in achieving behaviour change [155-157]. Therefore, next to providing feedback, it seems important to apply additional strategies in order to improve the motivation of patients to engage in treatment.

The aforementioned clinician feedback research has focused primarily upon treatment progress and was unable to determine which specific element(s) from the clinical support tools provided the mechanism(s) of action. Since treatment motivation has been found to be of crucial importance in this matter [29,35-37], the current study set out to place treatment motivation in a central position. The feedback that will be provided to the clinicians in the current study revolves around the patients' motivation to engage in their treatment. Therefore, our feedback intervention is labelled motivation feedback. The feedback to clinicians will be based upon the current motivational state of their patients regarding their motivation for remaining and engaging in treatment. Furthermore, solely providing feedback to clinicians of patients with severe mental illness might not be sufficiently intensive to improve treatment engagement [148]. To aid clinicians in addressing motivational problems that

become evident from the feedback, clinicians will be educated in motivation enhancement strategies based on Self-Determination Theory [48,64]. Despite the differences between the Transtheoretical Model [44], the Integral Model of Treatment Motivation [37], and Self-Determination Theory [48] on the concept of treatment motivation, these theories may complement each other [86]. A detailed discussion of similarities and differences in how these three theories predict treatment engagement and outcomes can be found in Jochems et al. [86].

We chose Self-Determination Theory (SDT) [64] as the basis of our motivation feedback intervention, since this theory encompasses both a qualitative and quantitative view of motivation and the intervention strategy that it implies seems suitable for patients with SMI. In brief, SDT postulates different types of motivation, where the most central distinction is made between autonomous (i.e. self-determined) motivation and controlled (i.e. externally determined) motivation. Autonomous motivation may vary from intrinsic motivation to types of extrinsic motivation in which people have identified with the value of a change and have integrated this change into their sense of self [82]. SDT poses that autonomously motivated people experience greater ownership of the behaviour, will have greater intention to persist in treatment and have better mental health outcomes [65,82]. In contrast, controlled motivation consists of external regulation, in which behaviour is regulated by external rewards or punishments, and introjected regulation, where the drive for behaviour is partially internalised and energised by avoidance of shame, guilt and anxiety [64]. When people have a controlled motivation, they will show poorer health outcomes according to theory [82]. Furthermore, SDT states that fulfilling the patients' basic psychological needs of autonomy, competence and relatedness during treatment will facilitate internalization of motivation for treatment, leading to better health outcomes [82].

Methods/Design

Aims

The study has three main objectives. The primary objective is to determine the effects of the motivation feedback intervention on treatment engagement (TE) of patients with psychotic and/or personality disorders. Secondary outcomes are the patient's treatment motivation, psychosocial functioning and quality of life. To this end, clinicians will be randomly assigned to either of two groups; one group will generate SDT-based feedback on the motivation of their patients while the other group will not.

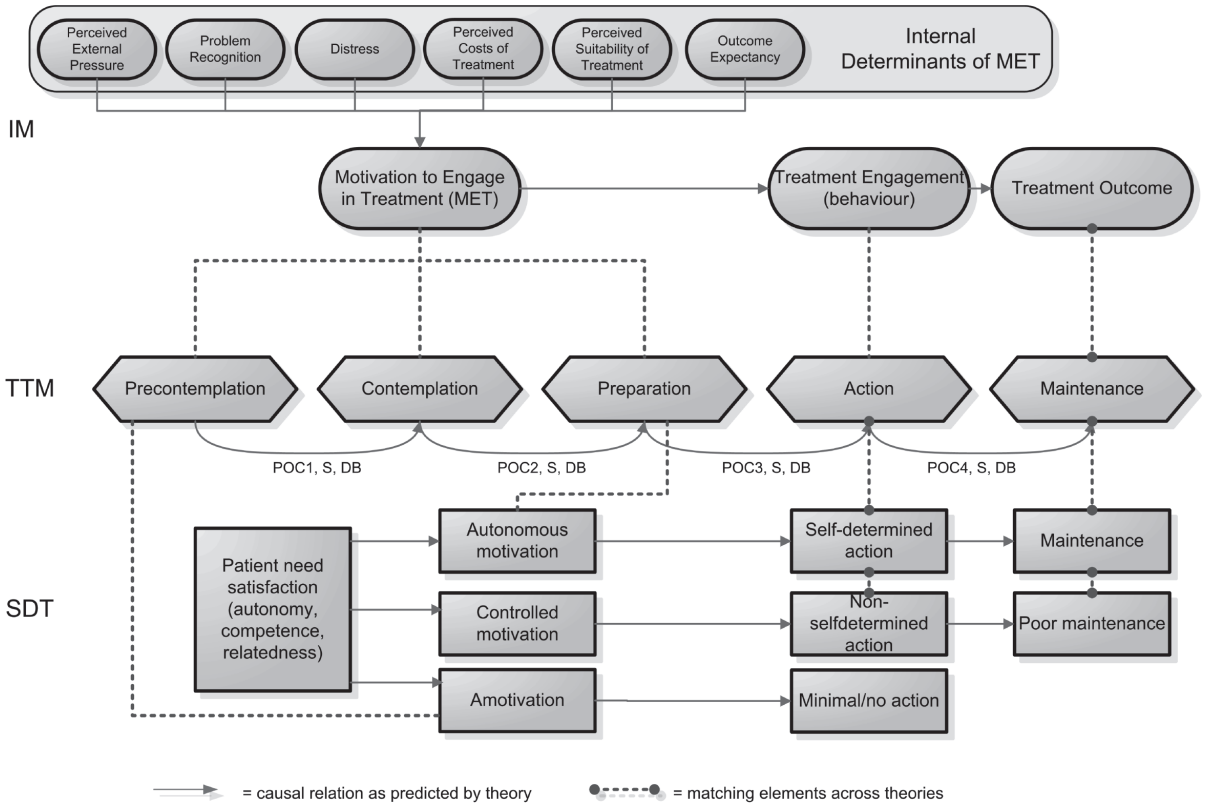
The second objective is to determine the factors associated with the effect of our motivation feedback intervention upon the primary and secondary outcomes. Several demographic and clinical factors as well as factors that have a theory-based and/or empirically established relationship with the outcomes will therefore be assessed. At the moment, it is unclear which exact factors are most important so this will be studied explorative.

The third and final objective of the study is to determine which theory of motivation is most plausible for the dynamics of TE and treatment motivation in patients with psychotic disorders and personality disorders in outpatient treatment. The models selected here are the Transtheoretical Model (TTM) [44], the Integral model of treatment motivation (IM) [37] and Self-Determination Theory (SDT) [64]. In a literature review that we have performed earlier, we have described these theories in detail, including their differences and similarities [86]. We will explore which of three theories (i.e. TTM, SDT, and IM) is most supported by the data in predicting treatment motivation and engagement. It is possible that different subcomponents of these theories will be integrated in a novel theoretical-empirical model tailored to this specific population.

Hypotheses

It is hypothesized that motivation feedback to clinicians on the treatment motivation of their patients will lead to an increase in both the quantity and quality of treatment motivation and treatment engagement of these patients. The patient's self-reported motivation and the clinician-reported motivation of the patient are expected to induce more awareness regarding motivational issues that are at play during treatment, and subsequently to more suitable (motivational) interventions leading to better outcomes (i.e. treatment engagement and psychosocial functioning). More specifically, we expect the increase in quantity and quality of motivation will follow the patterns shown in Figure 1. For example, in the intervention group we expect a larger increase in autonomous motivation (concept from SDT), a larger proportion of patients making forward shifts in the stages of change (concept from TTM) and a larger increase in motivation to engage in treatment (concept from IM) relative to the control group. As a consequence, we expect the intervention group to show a higher level of treatment engagement than the control group at the time of follow-up, as demonstrated by higher clinician-rated treatment engagement, less no-shows and better antipsychotic medication adherence in the patients with psychotic disorders.

Figure 1. Visualization of the three motivation theories and their potential interrelations



IM: Integral Model; TTM: TransTheoretical Model; POC1: Processes of change (consciousness raising, dramatic relief); POC2: Processes of change (self-reevaluation); POC3: Processes of change (self-liberation); POC4: Processes of change (reinforcement management, helping relationships, counterconditioning, stimulus control); S: Self-efficacy; DB: Decisional Balance; SDT: Self Determination Theory.

Treatment groups

Control Condition: Treatment as Usual

The control condition consists of patients who are provided treatment as usual (TAU). These patients receive care that is guided by their individual symptoms, problems and needs. Treatment may consist of assertive outreach, medication, cognitive (behavioural) therapy, stress-management, family therapy, and/or supportive structured therapy. Assertive outreach is provided by Flexible Assertive Community Treatment (FACT) teams. FACT is a team treatment model that aims to provide community-based, assertive, outreaching and supportive psychiatric services to individuals with SMI [14,15]. Besides assertive outreach, which is the key feature of Assertive Community Treatment (ACT), there is an emphasis on out-of-office interventions and home visits, but when patients constitute a danger to themselves or others and are not motivated for treatment, clinicians can start a procedure for them to be committed to a psychiatric hospital [14]. During hospitalisations, the ACT team keeps into contact with the patient to secure continuity of care. In the Netherlands, a special type of ACT teams exist, called Flexible-ACT (FACT). Van Veldhuizen (2007) has described Dutch FACT as follows: "FACT is a rehabilitation-oriented clinical case management model, which is based on the ACT model but is more flexible and able to serve a broader range of clients with severe mental illness. FACT offers the original ACT as one of several treatment or care models. The FACT team is a case management team with partly an individual approach and partly a team approach; the approach varies from patient to patient, depending on the patient's needs. For more stable long-term patients FACT provides coordinated multidisciplinary treatment and care by individual case management. Unstable patients at risk of relapse, neglect and readmission are provided with intensive assertive outreach care by the same team, working with a shared caseload for this subgroup. (p.422)" Patients and clinicians in the TAU condition will be assessed at baseline and at 12 months follow-up. Type, duration and frequency of TAU will be monitored.

Intervention Condition: Motivation Feedback

Patients randomized to the motivation feedback condition will receive treatment as usual (TAU)

and additionally, their clinicians will generate information regarding the patient's motivation to engage in treatment. Patients and clinicians in the intervention group will fill in a short motivation feedback questionnaire every month up to twelve months after baseline assessment that provides the clinicians with motivation feedback. The short motivation feedback questionnaire includes eight statements that relate to the level and type of the patient's treatment motivation, based on two types of motivation as distinguished by SDT. The individual items of both clinician and patients are rated on a 10-point continuous scale and can be plotted against each other in a graph to represent visual motivation feedback to the clinician. This graph then shows both the patient's rating and the clinician's rating of the current level of autonomous and controlled motivation of the patient. Figure 2 presents a hypothetical motivation profile and graphs of a possible course of the motivation over time.

Previous pilot testing with the short motivation feedback questionnaire among 55 patients with primarily anxiety and depressive symptoms receiving outpatient treatment showed that the list was comprehensible and easy to use in clinical practice. Clinicians appreciated the brevity and clarity of the items, which could function as a starting point for the discussion with the patient regarding his/her current motivation to engage in treatment.

Clinicians will be asked to fill in the short motivation feedback questionnaire just before the appointment with the patient. After having filled in the questions, the clinician will ask the patient at the beginning of the appointment to also fill in the questions on motivation for treatment. This information will be used by the clinician as a starting point for the discussion with the patient regarding his/her motivation for treatment. Clinicians randomized to the feedback condition, are expected to measure and discuss the current motivational status of their patients monthly. The clinician may use the information from the questionnaire and the subsequent conversation with the patient about this as feedback and apply an intervention tailored to the patients' current motivation. Clinicians will be free to decide for themselves how they will structure this discussion with the patient (e.g. discuss only one item or several, discuss differences between patient and clinician vision) and how long this will take. In case the patient is unable or unwilling to indicate his/her motivation, the clinician may still use his own judgment of the motivation of the patient and use this as self-generated feedback. Additionally, the motivation of the clinician to keep treating the particular patient is also measured monthly by asking the clinician to rate two other motivation items.

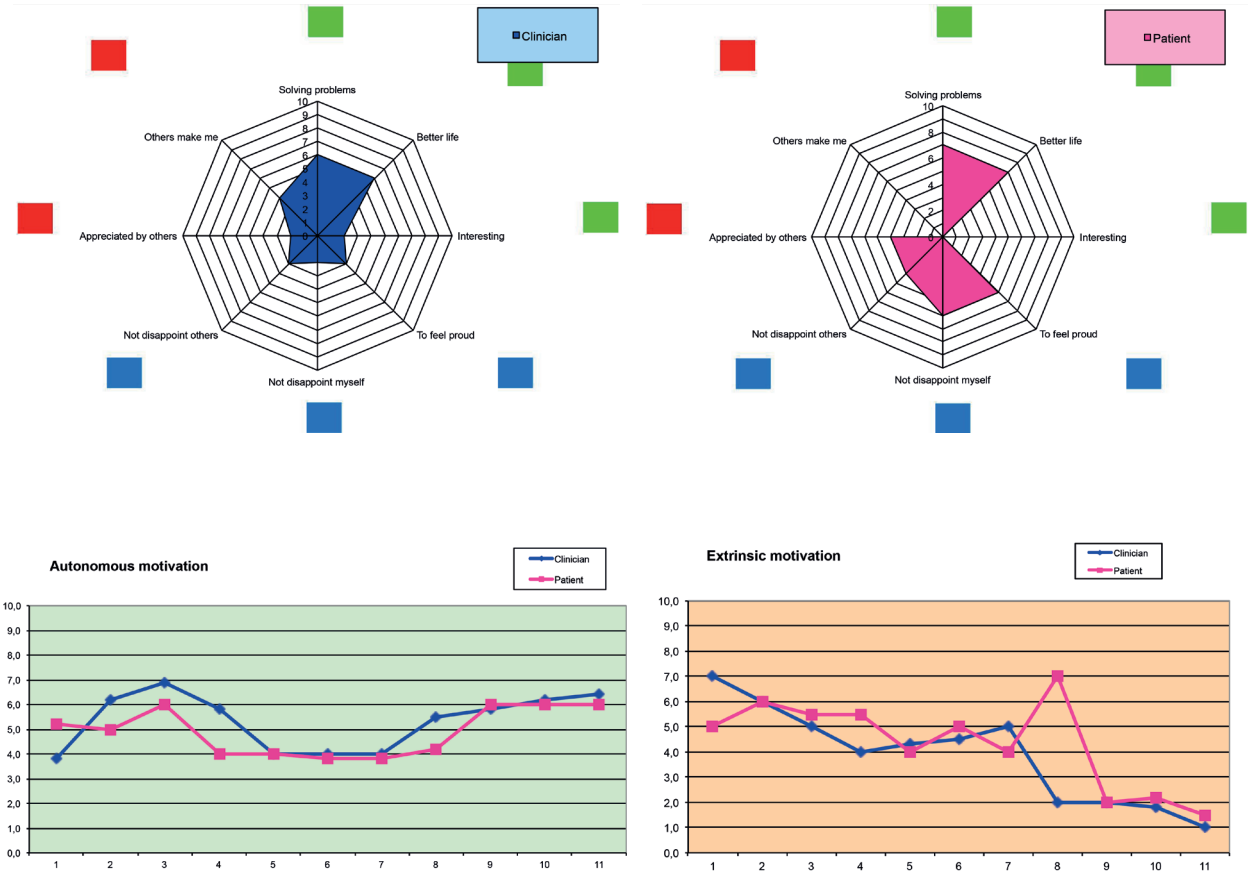
Before commencing the study, clinicians will be trained by the principal investigator how to read and interpret the motivation feedback graphs. During this training, they are given a presentation about the principles of Self Determination Theory, the different types of motivation postulated by SDT and perform exercises to learn how to distinguish the needs for autonomy, competence and relatedness in discussions with the patient. Clinicians also perform feedback assessments on each other during this training, to familiarize themselves with the feedback and how to introduce it to their patients. During the course of the study (i.e. one year) clinicians will be regularly contacted by the principal investigator to evaluate the motivation feedback intervention and to discuss their progress and experiences together with other colleagues who also participate in the motivation feedback intervention. During the evaluation sessions with the principal investigator, it can be checked whether the feedback is still being used properly (and if not, actions can be taken). To aid clinicians in remembering to perform SMFL assessments monthly, they will be given MotivaTe-IT bookmarks to use in their paper planners, electronic reminders will regularly be placed in the electronic planners, and the principal investigator will send emails to remind the clinicians of the motivation feedback.

In case a patient is transferred to another clinician during the course of the study (e.g. in case of treatment by a FACT-team where several clinicians cooperate to provide services to patients), the feedback generated by the patient will be provided to the clinician who is currently the primary clinician (i.e. case-manager) involved with the patient. The feedback generated by clinicians who have been engaged with the patient at an earlier moment in time will be provided to the clinician who is currently the primary clinician, so that it remains possible to keep monitoring the development of the patient's motivation over time.

Development of the Motivation Feedback Intervention

The guidance provided by the UK's Medical Research Council on developing and evaluating complex interventions (www.mrc.ac.uk/complexinterventionsguidance) states that the identification of evidence base and theory, the modelling of process and outcomes, assessing feasibility and piloting methods are important steps towards successful evaluations of complex interventions. The motivation feedback intervention under study here, although new in it's emphasis on

Figure 2. Hypothetical motivation feedback: the motivation profile by the clinician and patient (top parts) and the course of motivation (bottom graphs). The top part shows that although the clinician and patient agree that the patient is currently in treatment to solve problems and aim for a better life, the patient indicates that he also finds it important to feel proud of himself and to not disappoint himself. This could be a starting point for the discussion. In the lower graphs, it can be seen that the autonomous motivation had risen in the first three measurements and then dropped in the subsequent two measurements, at which point the clinician might choose to intervene.



motivation for treatment as the content of feedback (as opposed to care needs or quality of life), is otherwise fairly similar to previously trialled clinician feedback where it was found that feedback improved SMI patient outcomes in community mental health settings [152-154]. As Self-Determination Theory is the theoretical basis for the intervention, this ensures that the effects (or potentially no effects) of the intervention can be viewed in light of the processes of change proposed by this theory. Pilot testing with the novel short motivation feedback questionnaire in a group of patients with depressive and anxiety disorders showed that the list was comprehensible and easy to use, for both patients and clinicians. The clinicians reported that the questionnaire gave rise to interesting discussions with patients about drives and motivations that the clinician was unaware of, such as partners or children being more important drives to remain in treatment than levels of distress, or patients expressing that they felt very much coerced to enter treatment at first (sometimes even traumatic) but felt that this had progressed to more internal drives during the course of treatment. These pilot evaluations strengthened our belief that the intervention could be executed as intended. Due to time limitations however, no piloting was done with patients with SMI and the psychometric properties of this questionnaire remain to be determined. These issues will therefore be addressed during the course of the trial.

Design and setting

This study is a multicenter randomized controlled study with two treatment conditions: treatment as usual (TAU) and motivation feedback (additional to TAU). There will be two extensive measurement occasions for both groups: at baseline and follow-up at 12 months. Twelve departments within the Mental Health Center West North Brabant (MHC WNB), and the Mental Health Center BreBurg (MHC Breburg)

located in the south west of the Netherlands, were approached to participate in the study. The MHC WNB and MHC Breburg provide mental health care to varying patient populations, including patients with a primary diagnosis of psychotic and/or personality disorder who will be targeted for this study. The current study will take place at several treatment locations of the MHC WNB and MHC Breburg, and represents a partnership between these centers and the Epidemiological and Social Psychiatric Research institute (a research center within the Erasmus Medical Center in Rotterdam, the Netherlands).

Study population: Inclusion and exclusion criteria

The current study aimed for patients with severe mental illness treated in outpatient community mental health care, and although there are several definitions of severe mental illness, most definitions include a diagnosis of severe psychiatric disorder, a treatment duration or illness duration of at least two years and several disabilities [6,158]. Since patients with psychotic disorders constitute the majority of patients treated in assertive community mental health teams in the Netherlands [14,159] and patients with severe personality disorders constitute another significant part of the caseload, combined with clinical observations that these two diagnostic groups may especially benefit from interventions aimed at improving treatment motivation and treatment engagement, it was decided to incorporate both patient groups into the study.

The research participants will consist of patients with a primary diagnosis of a psychotic disorder and/or a personality disorder, and their clinicians. Patients are eligible for participation if they are aged between 18 and 65 years old and receive individual outpatient treatment for their psychotic and/or personality disorder. Exclusion criteria are insufficient command of the Dutch language and/or a documented diagnosis of organic psychosyndrome (e.g. dementia or chronic toxic encephalopathy).

Clinicians will be eligible for participation if they are the primary health care practitioner involved with the patient, meaning that he/she is the one that has the most frequent contacts with this patient. It is expected that the resulting group of clinicians will mainly consist of specialized social workers, specialized psychiatric nurses and psychologists with relevant treatment experience with this patient population.

Methods

In order to test the three motivational theories while also trying to limit the level of response burden for study participants in our intervention trial, proper choices for instruments had to be made. To ensure that we measure constructs appropriately for each theory, we tried to stay as close as possible to the original measures used by Ryan and Deci [64] for SDT, Prochaska and DiClemente [55] for TTM and Drieschner et al.[160] for IM. Priority was given to readily available Dutch versions of measurement instruments, but in case these were not available we chose to apply a translation procedure to the original English versions. Since our motivation feedback intervention is based on SDT, the primary outcome analysis is focused on this theory. Subsequently we will investigate how well the other two theories explain the effects of the intervention. Table 1 gives an overview of the instruments – questionnaires and interviews – that will be applied at baseline, monthly (for the intervention condition only) and at 12 months follow-up to patients and clinicians. It is estimated that the total duration of the assessment for clinicians takes 25 minutes per measurement occasion, while for patients this is 70 minutes.

Primary and secondary outcomes

The primary outcome in this study is actual treatment engagement, as measured with the Service Engagement Scale (see paragraph on treatment engagement). Secondary outcomes in this study are treatment motivation, as measured with the Treatment Entry Questionnaire (see paragraph on SDT instruments), administrative data on missed appointments (see paragraph on treatment engagement), psychosocial functioning and quality of life (see paragraph on secondary outcomes).

Treatment engagement

Treatment engagement will be measured with the Service Engagement Scale (SES) that was constructed by Tait, Birchwood & Trower [161]. The SES has 14 items that are rated on a 4-point scale ranging from 0 (not at all) to 3 (most of the time). The four subscales refer to availability, collaboration, help seeking and treatment engagement. The scale will be administered to clinicians. The original English version of the SES has shown good psychometric properties [161]. As a more objective measure of treatment engagement, data from the patients' files will be collected on the frequency of missed appointments with the main clinician, percentage of missed appointments over all appointments in the past year, reasons for discontinuation of care or drop-out (if applicable) and the number of admissions in the past year (voluntary and involuntary).

Furthermore, the Morisky Medication Adherence Scale (MMAS) [162] will be administered to

Table 1. Instruments used at two research contacts and monthly

Patients			
	T0 (Baseline)	Monthly	T1 (12 months)
TMS-f	x		x
URICA-D	x		x
SoC Algorithm	x		x
PCS			x
TEQ	x		x
HCCQ	x		x
IS	x		x
Zoo Map test	x		x
HAQ	x		x
TCI	x		
MMAS	x		x
HoNOS	x		x
BPRS*	x		x
MANSA	x		x
SDT graph*		x	

Therapists			
	T0 (Baseline)	Monthly	T1 (12 months)
TMS-f	x		x
URICA-D	x		x
SoC Algorithm	x		x
HAQ	x		x
SES	x		x
SDT graph*		x	
Therapist motivation**		x	

* Only patients and therapists in the motivation feedback condition fill in the SDT graph.

** Only therapists in the motivation feedback condition fill in two items regarding their motivation to treat the patient.

HoNOS: Health of the Nations Outcome Scales, BPRS: Brief Psychiatric Rating Scale, MANSA: Manchester Short Assessment of Quality of Life, TMS-f: Treatment Motivation Scale for forensic patients, SoC algorithm: Stages of Change algorithm, URICA-D: University of Rhode Island Change Assessment – Dutch version, PCS: Processes of Change Scale, TEQ: Treatment Entry Questionnaire, HCCQ: Health Care Climate Questionnaire, SIPP-SF: Severity Indices of Personality Problems – Short Form, IS: Insight Scale, HAQ: Helping Alliance Questionnaire, TCI: Temperament and Character Inventory, MMAS: Morisky Medication Adherence Scale, SDT graph: Self-Determination graph, SES: Service Engagement Scale.

only to patients with psychotic disorders to measure the level of antipsychotic medication adherence. The MMAS is a self-report scale that consists of 8 items asking about a specific medication-taking behaviour. The total scale score can range from 0 to 8, which will be discretized into high adherence (score of 8), medium adherence (score of 6 or 7) or low adherence (score below 6) [162]. The scale was found reliable (Cronbach's α= 0.83) as a measure for blood pressure medication adherence in patients with hypertension [162] and has been adjusted to fit our study population of psychotic patients. Additionally, the psychiatrists of the patients with psychotic disorders will be asked every six months to indicate whether they believe the patient adheres to the antipsychotic medication and if not, to give reasons for the patient's nonadherence.

Psychosocial functioning

Psychosocial functioning will be measured with the Dutch version of the Health of the Nations Outcome Scales (HoNOS) [163,164]. The HoNOS form is completed via a semi-structured interview with the patient. The HoNOS quantifies health and social problems during the previous two weeks and contains 12 items that refer to behavioural problems, impairment, symptoms, alcohol and drug abuse, and social (dis) functioning. Three HoNOS addendum items are also administered. These refer to manic symptoms, treatment motivation and compliance with medication. The items are rated from 0 (no problem) to 4 (very severe problem). The HoNOS has shown to be reliable and sensitive to change [164]. In order to obtain a more differentiated understanding of the psychotic symptoms, five items from the Brief Psychiatric Rating Scale [165] will be administered additionally to the HoNOS items in the interview with the patient. These include suspiciousness, unusual thought content, grandiosity, hallucinations and blunted affect. The BPRS has been used in various settings and has shown good psychometric properties [166].

Quality of Life

The Manchester Short Assessment of Quality of Life (MANSA) [167] will be used to measure quality of life. The MANSA is a self-report questionnaire administered to the patient to measure how satisfied the patient is in the following life domains: living situation, social relationships, physical health, mental health, safety, financial situation, work situation and life as a whole. Each question is answered on a 7-point scale (1 = not satisfied, 7 = very satisfied) and a composite (mean) score is calculated. The psychometric properties are satisfactory [167], and the scale has also been validated in a population of patients with severe mental illness [168].

SDT instruments

The types of motivation that are distinguished by SDT will be measured with the Treatment Entry Questionnaire (TEQ) [35,126]. It was shown that the TEQ was reliable (i.e. internally consistent) for external (Cronbach's α = .89), introjected (Cronbach's α = .89) and identified motivation (Cronbach's α = .85) [126]. To our knowledge, the TEQ has not been studied in a Dutch population before. Therefore, we translated the original TEQ by Wild et al. [126] and adapted the wording to fit a population of patients with severe mental illness in psychiatric treatment (e.g. words that referred specifically to addiction treatment were replaced by words that reflected more general treatment by a mental health center). Two translators performed independent forward translations of the original TEQ into Dutch and adapted the wording to fit its application to outpatient psychiatric treatment. A consensus version was established, consisting of 27 items that can be rated on a 7-point Likert-scale ranging from 1 (strongly disagree) to 7 (strongly agree). The psychometric properties of this Dutch TEQ are to be investigated in this study.

The Health Care Climate Questionnaire (HCCQ) will be used to measure the degree to which clinicians are perceived to be autonomy supportive. Items are scored on a Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The HCCQ has 15 items that have been used in studies of weight loss [134] (Cronbach's α =.92) and smoking cessation [169] (Cronbach's α = .96). Application of a Dutch HCCQ is not known to us. Therefore, the original HCCQ was translated into Dutch by two independent translators who subsequently established a consensus version. This consensus version was back translated into English by two independent expert translators to check for discrepancies between the original version and the backtranslation. On the basis of consensus between all translators, the final Dutch questionnaire was achieved. The psychometric properties of the Dutch HCCQ will be determined in this study.

TTM instruments

The stages of change will be measured by staging algorithms and the University of Rhode Island Change Assessment – Dutch version (URICA-D). Algorithms are capable of placing individuals in one of five stages and have been used extensively in diverse populations and research areas [55,87,93]. The algorithm approach involves several questions that ask about attempts and intentions to change behaviour within certain time frames corresponding to a particular stage. Both patients and clinicians will be asked to judge whether the patient is currently in the precontemplation, contemplation, preparation, action or maintenance stage with regard to the patients' motivation to change his psychiatric problems and specific problem behaviours if relevant (e.g. alcohol abuse, drug abuse and criminal behaviours). Precontemplation is defined as 'not planning to work on my problems in the next six months'. Contemplation is defined as 'planning to work on my problems within the next six months, but not within 30 days from now'. Preparation is defined as 'planning to work actively on my problems within the next 30 days'. Action is defined as 'having worked on my problems actively for the last 30 days, but no longer than six months'. Maintenance is defined as 'having worked actively on my problems for the last six months'. These definitions are similar to other stage algorithms from TTM [88].

The URICA-D is the Dutch version of the URICA [38], which is a self-report scale that asks the patient to first enter a problem and then to indicate on a five point Likert scale (1 = strongly disagree to 5 = strongly agree) how much he agrees with a particular statement. The URICA-D consists of four subscales which represent four stages of change: precontemplation, contemplation, action and maintenance. The reliabailities (i.e. Cronbach's alpha) for the subscales have been found to range from 0.84 to 0.95 [170].

The processes of change will be measured by asking patients to indicate how often they make use of the strategies described in 20 statements, where each process of change is represented by two statements. The statements are rated on a five point Likert scale, ranging from 1 (never) to 5 (repeatedly), consistent with other measures of the processes of change in TTM [96,171,172]. Application of the processes of change scale in a Dutch psychiatric patient population is not known to us. Therefore, we developed a questionnaire based on the original English questionnaire by Prochaska et al. [96] and adapted it to a population of people with mental illness in psychiatric treatment. Two translators performed independent forward translations of the Processes of Change Scale (PCS) [96] into Dutch and adapted the wording to fit its application to change processes in psychiatric treatment. From the 40 items generated in this translation procedure, a consensus version was established from which 20 items were chosen (two items per process) as most relevant to create a short form of the processes of change inventory, consistent with other short forms of the processes of change inventory (e.g. in the studies of [57,171]). The psychometric properties of our scale are to be investigated in this study. The decisional balance constructs and self-efficacy constructs are incorporated in the Treatment Motivation Scale

for forensic patients [160], a scale that will be used to measure the constructs of the IM (see next section).

IM instruments

The constructs within the IM will be measured by the Treatment Motivation Scale for forensic patients (TMS-f) [160]. The TMS-f consists of eight subscales, one scale for the motivation to engage in treatment (MET) and six scales for variables that are summarized as Internal Determinants of MET: problem recognition, distress, perceived legal pressure, perceived costs of treatment, perceived suitability of treatment and outcome expectancy. An additional scale assesses the patients' tendency to respond according to social desirability. The items within the scale of 'perceived legal pressure' were adapted to fit a more broadly defined concept of perceived External Pressure, in order to fit all patients in our research population. The TMS-f has a patient version (86 items) and a clinician version (7 items), and both will be used in our study. The TMS-f has been found to be a reliable and valid operationalisation of the constructs in IM [116,118,160]. However, the TMS-f has only been used in a forensic psychiatric setting and it remains to be determined whether the scale is also applicable outside this setting. In the total patient population in which the scale was validated, it was found that 61% of the patients had axis-I disorders, while strong characteristics of personality disorders were prevalent in 78% of patients [118,119]. The composite reliability of the scale ranges between $\alpha = .83$ and $\alpha = .91$ [160].

Covariables

Socio- demographic factors of patients and clinicians

Socio-demographic data on gender, age, ethnicity, marital status, living situation, housing, distance from the treatment location, educational background, income, treatment history, treatment duration, no-shows in the treatment in the previous twelve months, legal status, medication use, and DSM-IV diagnosis will be collected at baseline from the patient's medical record. In case of missing information in the medical record, the patient will be asked to provide the information. Information on clinician sex, age, years of clinical working experience, and treatment team was collected from clinicians.

Insight into illness

Impaired insight has been associated with reduced treatment engagement and increased symptoms, as well as higher rates of involuntary detention [173]. The Insight Scale [174] will be used to measure a patients' insight into illness. This 8-item self-report scale produces a total score that ranges between 0 and 12. It was found to be a reliable, valid and easily applicable measure [174].

Executive functions

There is considerable evidence for cognitive dysfunctioning, especially impaired executive functioning, in patients with severe mental illness [175-177]. Executive dysfunctioning has been found to contribute to poor insight in psychosis and might be related to poor treatment engagement [177]. As a measure for executive functions, planning ability was chosen. Although the Wisconsin Card Sorting Test (WCST; [178]) is typically administered as a measure for executive functioning [177], the inclusion of this test to our study instruments would increase the burden to the patients such that we decided it was unsuitable for administration. Alternatively, planning ability will be measured with the Zoo Map test, a subtest of the Behavioural Assessment of Executive Functioning (BADS) [179,180]. The Zoo Map test asks the patient to draw a route on a map of a zoo and to visit specific sites in the zoo while applying specific rules (e.g. 'you can use the dotted pathways as often as you want, but the white pathways only once'). There are two subtests within the Zoo Map test: the first is unstructured, forcing the patient to plan his route independently. This indicates the extent to which the patient is capable of spontaneous planning. The second condition is structured and indicates a specific order in which the patient should visit the specific sites. This indicates the ability of a patient to follow a concrete, externally demanded strategy. Theoretically, it is expected that patients who find it difficult to develop logical strategies on the Zoo map test also have more difficulties with following a (complex) treatment regimen. The time used for planning and execution of the task and the number of mistakes (breaking a rule) are scored, and a profile score ranging from 0 to 4 for each subtest is then derived. The BADS has shown adequate validity and test-retest stability [180,181].

Therapeutic alliance

The therapeutic relationship is measured with the Helping Alliance Questionnaire (HAQ). The Dutch version of the HAQ comprises 11 items that are rated on a 5-point scale (completely disagree, disagree, neither agree nor disagree, agree, completely agree) [182]. Both a patient and a clinician version have been developed (example items include "I feel the clinician understands me"; "I understand the patient"). The HAQ contains two scales: Cooperation (Cronbach's $\alpha = 0.88$) and Helpfulness (Cronbach's $\alpha = 0.76$) [182]. Modest associations have been found between

the therapeutic alliance and client outcomes in community mental health for patients with severe mental illness [183,184]. However, it has been noted that most studies performed in these settings have been limited by a lack of power and standardized measures [183]. Possibly, the current study can improve on these limitations.

Experienced stigma

Stigma will be measured using the 12-item 'perceived devaluation and discrimination' subscale of the self-report Stigma-Scale [185]. This subscale refers to the perception of common opinions about psychiatric patients, such as 'Most people stay friends with someone who has had a mental illness' and 'Most people look down on people who have been hospitalized for mental illness'. The items are scored on a scale from 1 (strongly disagree) to 4 (strongly agree). A higher total scale score means more perceived stigmatization. The scale had acceptable reliability (Cronbach's alpha = .78) and construct validity was demonstrated in studies predicting associations between stigma (as measured with the subscale of 'perceived devaluation and discrimination') and self-esteem, employment, demoralization, quality of life and treatment seeking in patients with mental illness [186,187].

Personality characteristics

The temperament dimensions from the Temperament and Character Inventory (TCI) [110,188] will be used to measure personality characteristics, in order to explore the relationship between temperament and motivation to engage in treatment. The temperament dimensions from Cloninger's theory called novelty seeking, harm avoidance, persistence and reward dependence [110,189] are used in this study. Convergent validity exists in the form of studies comparing the TCI scales with other similar scales of validated personality tests [110]. The internal consistencies (i.e. Cronbach's alphas) of the novelty seeking, harm avoidance, persistence and reward dependence subscales varied between α =0.62 and α =0.90 in psychiatric patients recruited from community mental health care [110]. The temperament dimensions are measured by items that can be scored as true or false.

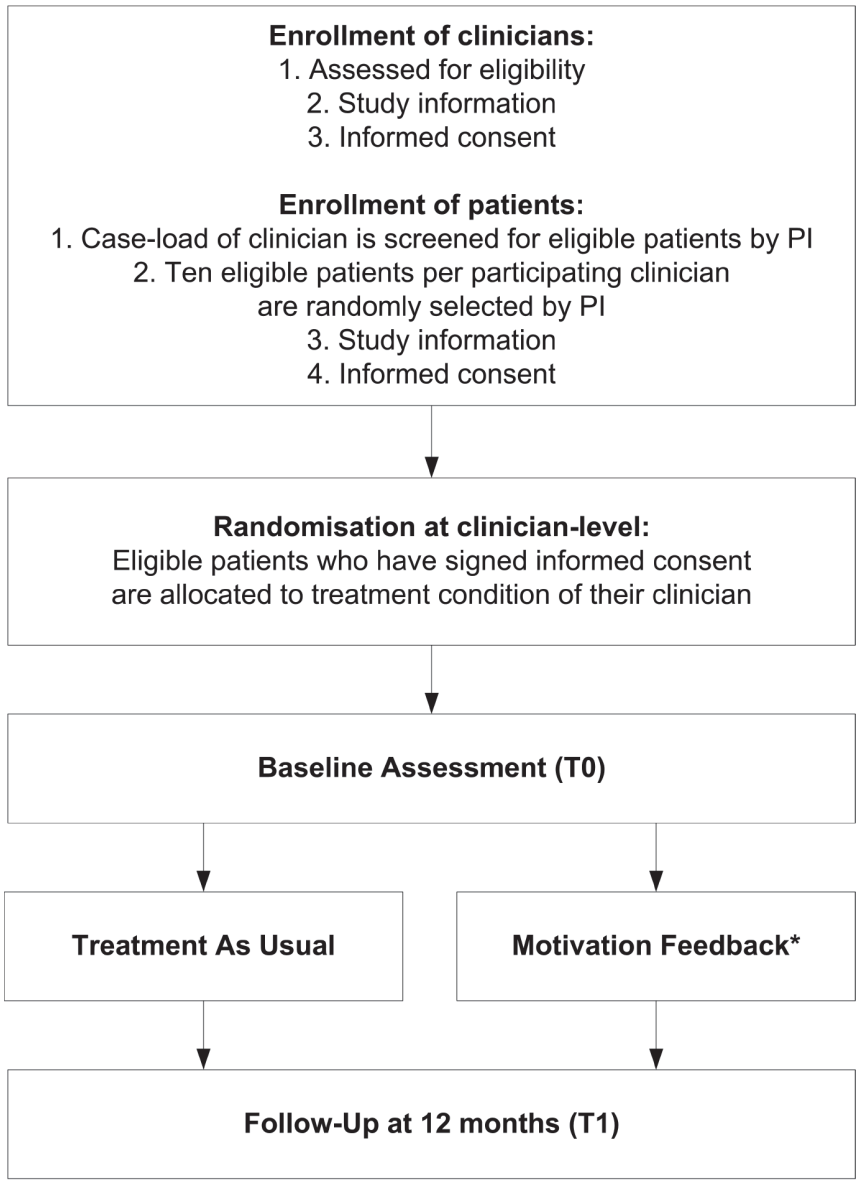
Procedures and randomization

Figure 3 shows the study procedures. Eligible clinicians and patients will mainly be approached via specific treatment programs that provide FACT (for a description of FACT see the section on Treatment As Usual). Clinicians who are willing to cooperate in this study will be informed by the principal investigator regarding the goals and procedures of the study and receive an information brochure. Two weeks after having received the information brochure, clinicians will be contacted to ask for participation and to sign informed consent.

After having received informed consent from the clinicians, randomization will be performed at either clinician-level or team-level. Where clinicians work in FACT-teams, randomization will be performed at team-level so that a whole team (all clinicians working in this team) will be allocated to either the TAU condition or motivation feedback condition. As teams often work with a shared caseload between clinicians in the same team, this decision was made in order to prevent possible cross-over of the feedback-condition to the TAU condition within teams. Where clinicians work in an outpatient clinic on a one-to-one basis (individual case-management) then randomization will be performed at the clinician-level. The allocation ratio is 1:1 (i.e. therapist vs. therapist and team vs. team, respectively). Stratification for diagnosis in advance was considered unrealistic and impractical, as we would then have to achieve equal numbers of each patient diagnosis in each treatment condition, while our randomization is at team-level and clinician-level. Therefore, we chose to use multivariate modelling with diagnosis as a covariate (see section 2.9 'Statistical analyses'). Randomisation will be performed by assigning each randomization unit (e.g. a team or a clinician) a unique number, which is entered in a computerized randomization program (www.randomization.com) that randomizes each unit to a single treatment by using randomly permuted blocks. The randomization is single-blind, as both the principal investigator and clinicians need to know which condition the clinicians are in, in order for the clinicians to receive the necessary training for the intervention condition (or not). As a consequence, only patients will be blind to treatment allocation at baseline assessment, while clinicians are not. Due to the nature of the trial, follow-up assessment can not be blinded.

Subsequently, clinicians are asked to provide a list of their entire caseload to the principal investigator (PI). The PI will remove patients from this list who do not fulfil the inclusion criteria or fulfil the exclusion criteria and subsqequently, the PI will randomly select 10 eligible patients from this list to be asked for participation in the study. Clinicians will inform their selected patients about the objectives of the study, and provide a full explanation of all procedures for the study. If patients are willing to participate, an appointment is scheduled for the administration of the HoNOS.

Figure 3. Flowchart of MotivaTe-IT procedures



At the beginning of the appointment, again all procedures of the research study are explained to the patient and signed informed consent will be obtained by the research assistant. Written information will also be provided to the patient, which explains the nature of the intervention and provides contact details of the research team. Following the informed consent procedure, baseline assessment will take place. The HoNOS will be administered by the case-manager of the patient accompanied by an independent research assistant, who will assist in the interview and scoring of the HoNOS. This decision was made for several reasons. The first is that the case-managers have been trained to administer the HoNOS for Routine Outcome Monitoring, which is primarily used in clinical practice to guide treatment plans and evaluations and is now secondary used as an outcome in the current research study. Combining the two approaches ensures that Routine Outcome Monitoring procedures can be maintained (by the case-manager) while research requirements can be met (by the independent research assistant monitoring the administration and scoring of the HoNOS). Secondly, the response rates for the interviews is expected to be higher if the patient is approached by a familiar person (the case-manager). This might typically be the case for the more paranoid or anxious patients. Third, the presence of an independent research assistant who is also trained in the administration of the

HoNOS likely ensures that the HoNOS is scored appropriately, to minimise a possible bias that might occur if the case-manager alone would do this. The self-report questionnaires will be administered by research assistants, only sometimes in the presence of the case-manager when the patient is seen at home to ensure the safety of the research assistant or to minimise feelings of anxiety with patients (who might feel intimidated by an unfamiliar person), but always ensuring the confidentiality and anonymity of the collected data.

Assessments of the HoNOS and self-report questionnaires will take place at baseline and follow-up at 12 months. Baseline assessment will take place after randomization to reduce the variation in the time between baseline assessment and the start of the intervention. Measuring baseline status close to the start of the intervention ensures that the information obtained at baseline assessment is still up to date at the start of the intervention. A limitation to this approach is that clinicians are aware of the treatment allocation, which may bias their responses. This possible information bias can not be eliminated since clinicians in the motivation feedback condition have to be trained in the relevant procedures before baseline assessment, since shortly after they will start employing the feedback intervention. Patients however, will not be informed about their treatment allocation at baseline assessment and are therefore blind to treatment allocation at the start of the study. In case patients drop-out from treatment or complete their treatment before these 12 months have passed, information regarding the reason for ending the treatment and total treatment duration will be obtained.

Sample size and power calculations

The RCT was designed to enrol an average of 6 patients for each of 56 participating clinicians. The sample size was calculated on the basis of our primary hypothesis, that the intervention group (motivation feedback) would be more effective than the control group (treatment as usual) in enhancing treatment engagement, as measured with the Service Engagement Scale (primary outcome) at 12 months after baseline assessment. The difference between the motivation feedback group and control group for the primary outcome is based on a power of 0.80 and an alpha of 0.05 (two-tailed). Earlier studies regarding differences between feedback and treatment as usual (control) conditions have shown effect sizes (standardized mean differences) ranging from 0.34 to 0.92 [148,149], but were based on treatment progress and not (solely) on treatment motivation. One RCT studying the effects of treatment adherence therapy in patients with psychotic disorders used the SES as outcome measure and found an effect size of 0.39 [190]. Therefore, we expect an effect size of approximately 0.40. Using an unpaired t-test statistic, this resulted in a minimum of 123 subjects per condition. However, as patients are clustered within clinicians, and clinicians are clustered in teams, the patient and clinician observations can not be considered as independent of each other. The sample size was therefore adjusted by the (variance inflation) factor $f = 1 + (m - 1)\rho$, to account for the variance that would have been achieved had there been no clustering. The cluster size (m) is 6 (patients per clinician) and the within-cluster correlation (ρ) was estimated from a previous study to be around 0.07 [153]. Thus, the computed sample size was inflated by 1.35 to be at least 166 subjects per condition (minimally 332 in total). The SES is rated by clinicians and so we expect minimal loss to follow-up on the primary outcome, but to be on the safe side we will aim for 350 patients as the total sample size.

Statistical analyses

The data of the RCT will be analysed according to the intention-to-treat principle. Baseline comparability between the intervention group and control group in demographic and clinical variables will be evaluated with independent samples t-tests and chi-square tests. Furthermore, non-responders (i.e. eligible patients who chose not to participate in the study) will be compared to responders with respect to background demographic and clinical variables with independent samples t-tests and chi-square tests. Logistic regression analysis will be applied to test for differences between the motivation feedback and control group with respect to the primary and secondary outcomes that are dichotomous variables, while (multiple) linear regression analysis will be used in case of continuous outcome variables. For individual categorical outcome variables, the effectiveness will be determined by odds ratios, including p-values (two-tailed). The effectiveness of the variables combined will be determined by ROC-curves (for categorical outcomes) and the individual odds ratios, R2 and the individual regression coefficients (for continuous outcomes). The Hosmer and Lemeshow goodness-of-fit test will be used in case of logistic regression. In case of multiple regression analysis the classical regression diagnostics will be applied for normality, (non) linearity, heteroscedasticity, (influential) outliers and interaction. A subgroup analysis will be performed for patients with psychotic disorders for the effects of the intervention upon their antipsychotic medication adherence. The analyses will be performed both

unadjusted and adjusted for baseline differences of the distributions between the two treatment groups. In analyzing a specific outcome variable, the baseline score of that variable will be used as covariate. The analysis will be extended using multilevel analyses that takes the nesting of measurements into account. A clustering of outcomes is likely since a single clinician may treat several patients, and clinicians are clustered into teams. Multilevel modelling will be performed to check for any clustering effects on the primary outcome. In the multilevel analyses we consider the two measurements as the first level and the patient as the second level. We will explore whether the different treatment locations (FACT teams) and institutions (MHC Breburg and MHC WNB) can be considered as random factors in the modeling. We will identify predictive factors in estimating the outcome and whether there are predictive factors dependent on the type of treatment condition (interaction between baseline variables and treatment effect). Furthermore, we will take into account to what extent patients were exposed to the intervention by analyzing the dose-effect relationship. We expect (as is the case in most empirical studies in a psychiatric setting) that missing data will occur. We expect that the data will be Missing At Random (MAR), which is allowed to be a function of the observed variables (both covariates and outcome variables). If the assumption of MAR is violated, the pattern mixture model approach will be applied. In case predictor variables are missing, the method of multiple imputations or the maximum likelihood estimation method will be applied.

For monthly measurements (i.e. the motivation feedback graph for patient and therapist, and the therapist motivation) the method of mixed modelling will be applied. This highly flexible method enables two level models: repeated measurements (level 1) and patient level (level 2). The three motivational theories will be modelled with Structural Equation Modelling (SEM), in order to study their fit to the empirical data, their predictive power and parsimony (i.e. whether the model can be simplified without substantially reducing the model fit and predictive power). The three motivational theories will be studied exploratively to determine which theoretical constructs are most plausible (i.e. clinically relevant and statistically significant) for the prediction of the outcome variables. The difference of the two -2log-likelihood tests (including the difference of degrees of freedom) will be used for testing differences between nested models, and information criteria will be used for differences between non-nested models (i.e. Akaike Information Criterion/AIC, Bayesian Information Criterion/BIC and adapted BIC). Where relevant, the 95% confidence intervals and/or P-values (two-tailed) will be reported.

Ethical considerations

The current research protocol was endorsed by the Medical Ethical Committee for Mental Health Care Institutions (METiGG) and by the committees for scientific research within the two mental health institutions where the data will be collected (MHC WNB and MHC Breburg). The collected data are treated according to the Medical Confidentiality Rules, and are kept in locked files cabinets. Every patient will be assigned a patient number, so that processing of the data will occur anonymously. Access to data is limited to members of the research group and the medical ethical committee (METiGG). The study will be conducted in accordance with the Helsinki Declaration. As mentioned previously, written informed consent will be obtained for all clinicians and patients that are entered into the study. Patients and clinicians are free to refuse participation at any time during the research period, without having to disclose any reason why.

Patients that are included in the study will receive an incentive of € 15, - after every completion of an extensive measurement (baseline and follow-up). Thus, if a patient has completed both measurement occasions, he or she will have received € 30, - in appreciation of his/her cooperation. These incentives are introduced in order to increase the response rate, since it is expected that in this patient population with severe mental illness and possibly with motivational problems, the response rate would otherwise turn out too low. The effects of the intervention are unknown at this moment, and therefore we think it is justified to allocate patients randomly over the two conditions.

Discussion

The central research question in this study is whether the motivation feedback intervention is able to increase the treatment engagement of patients in outpatient psychiatric treatment for severe mental illness. The secondary research question is whether the intervention improves treatment motivation, psychosocial functioning (health and functioning in several life domains) and quality of life. Thirdly, three theories of motivation will be assessed on their core theoretical constructs to investigate which theoretical constructs and which theory is best able to predict the outcomes in this patient population. The identification of possible mediating and moderating mechanisms through which changes in the outcomes occur, offer a tool for the

development of future interventions. The study has several strengths and limitations.

Limitations

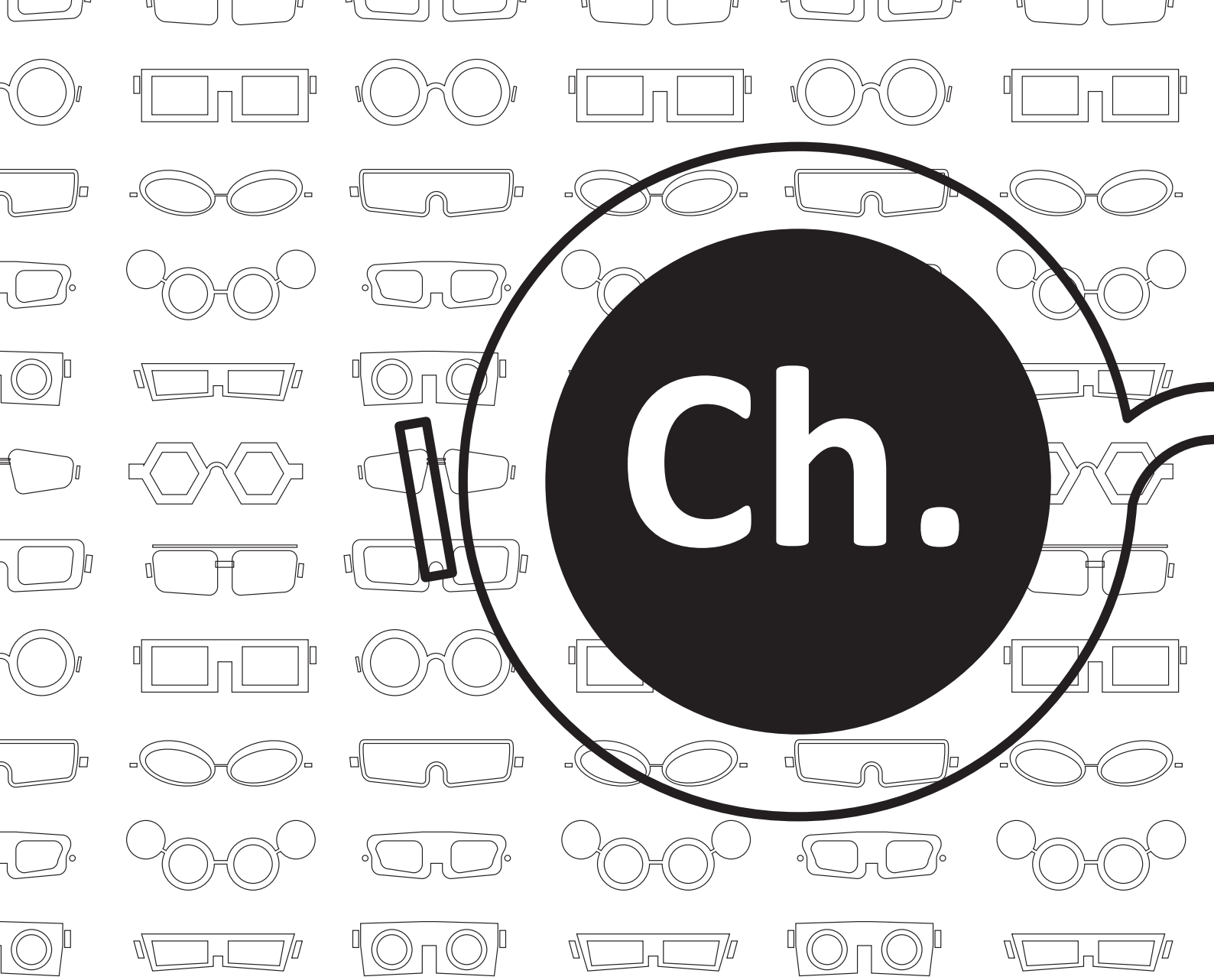
The main limitation of the design is that patients and clinicians are not blind for the treatment condition to which they are randomized. Clinicians will be informed about their treatment condition, since it is required that clinicians in the motivation feedback condition receive training. Patients are blind for treatment condition at the baseline assessment, but not at follow-up assessment since they will realize what condition they are in once their clinician starts asking them to fill in the feedback questionnaires monthly after baseline assessment – or not. This could lead to information bias, as patients and clinicians in the intervention group may be more actively involved in the treatment as they expect it to work, which may enhance the effect of the intervention we find. This would especially be the case for the subjective (i.e. self-report) outcome measures that are administered to patients and clinicians, but less so for the objective outcome measures (e.g. number of no shows and drop-out as registered by the institution's administrative system). Regarding the HoNOS, which is administered by the patient's case-manager and an independent research assistant, we have weighed the possible bias that could occur due to the presence of the case-manager with the advantage of achieving higher response rates for the study, thereby minimising a possible selection bias (that would occur if the more severe mentally ill group would decline participation if asked by an unfamiliar person). We believe that the presence of the independent research assistant during the administration and scoring of the HoNOS ensures that the HoNOS is scored appropriately and will minimise the former bias. A second limitation is that it is not possible to determine which exact component of motivation feedback contributed to the effect, since it might be possible that measuring patient progress systematically in itself is key to the effects – whether you measure the patient's motivation or the patient's symptoms or any other patient characteristic – or the fact that the intervention includes reminders to the clinician to keep in contact with the patient for the measurement of the motivation. In order to have some idea of which elements contributed to the effect of the intervention, we will monitor the number of times the feedback was used, the amount of time that was spent on discussing the feedback, characteristics of clinicians using the feedback and the motivation of the clinician to treat the patient. Thirdly, the DSM-IV diagnosis is not established with structured diagnostic interviews, but is obtained from the patients' medical records. This choice was made to reduce patient burden, since structured interviews were considered too extensive and time-consuming in combination with the other instruments used in this study.

Strengths

The strengths of this study include the design and the clinical relevance. The patients in the study are retrieved from a general population of severe mental illness (i.e. psychotic disorders and personality disorders), representing a 'real-life' population including patients with a variety of comorbid disorders rather than a more narrow selection of patients. Therefore we will be able to generalize our findings to a large group of outpatients with psychotic disorders and personality disorders. The design of the motivation feedback intervention is based upon empirical evidence of interventions that have proven efficacious in lowering treatment non-completion and drop-out. Most of the studies concerning feedback have been based upon self-report measures from the perspective of the patients. The current study also incorporates the clinicians' perspective upon the patients' motivation for treatment. Also, past research concerning the effects of feedback has largely included patients with relatively mild problems and non-specific disorders (for example, the studies by Lambert et al. [145,146] were based on data from a university outpatient clinic). The current study will focus upon patients with severe psychiatric problems.

Regarding the theory comparisons it should be noted that SDT will be tested most rigorously in this study, since this theory will be used as the basis for the intervention in this study and its core theoretical components will be manipulated (i.e. the basic psychological needs will be supported by clinicians, and motivational types will be known and responded to by clinicians). Although the other two theories are not tested so rigorously (i.e. they are not part of the intervention), the core theoretical constructs of IM and TTM are followed prospectively over the course of 12 months in order to determine if the constructs behave as the theories suggest and to see if they are able to predict treatment motivation and treatment engagement at follow-up. The design of our study fulfils most of the criteria that have been suggested by Noar and Zimmerman [75] for theory comparison studies. The criteria are: 1) having a longitudinal design, 2) using Structural Equation Modelling, 3) including past behaviour and (4) demographics in the model tests, 5) including non-college participants in the sample, 6) having a strong sample size (N>200), 7) utilizing multiple

samples in model testing, 8) utilizing samples from more than one country, 9) having more than one dependent variable (e.g. motivation and behaviour), 10) examining more than one behaviour, 11) comparing more than two theories and (12) empirically examining an integrated model [75]. All criteria except 8 and 10 are fulfilled by our design. Furthermore, most previous studies employing the TransTheoretical Model have only measured the stages of change, while the model also incorporates other constructs. The current study measures both the stages of change, the processes of change, self-efficacy and the decisional balance constructs. Thus, a strong aspect of this study is that it includes all core theoretical constructs of the three motivational theories.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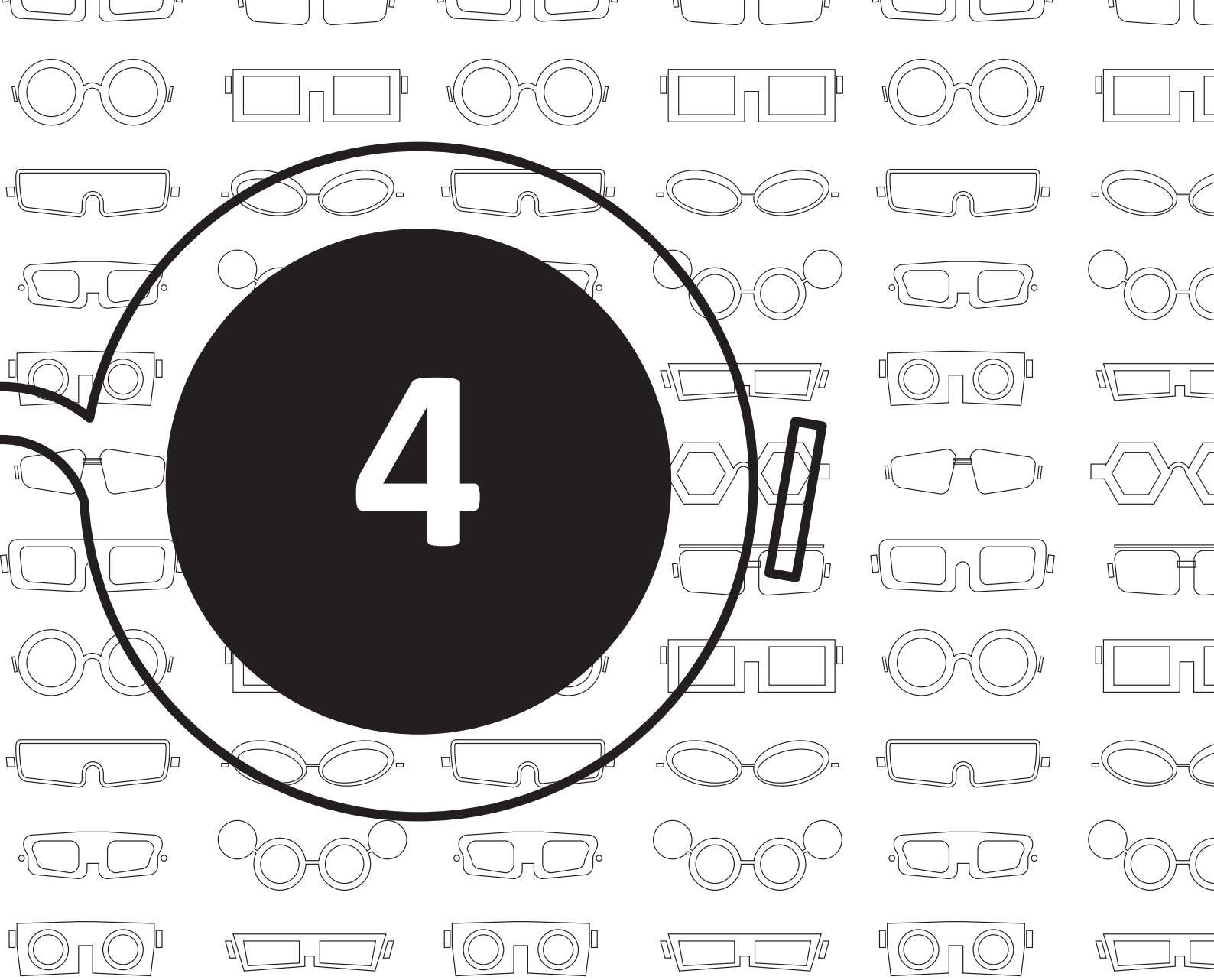
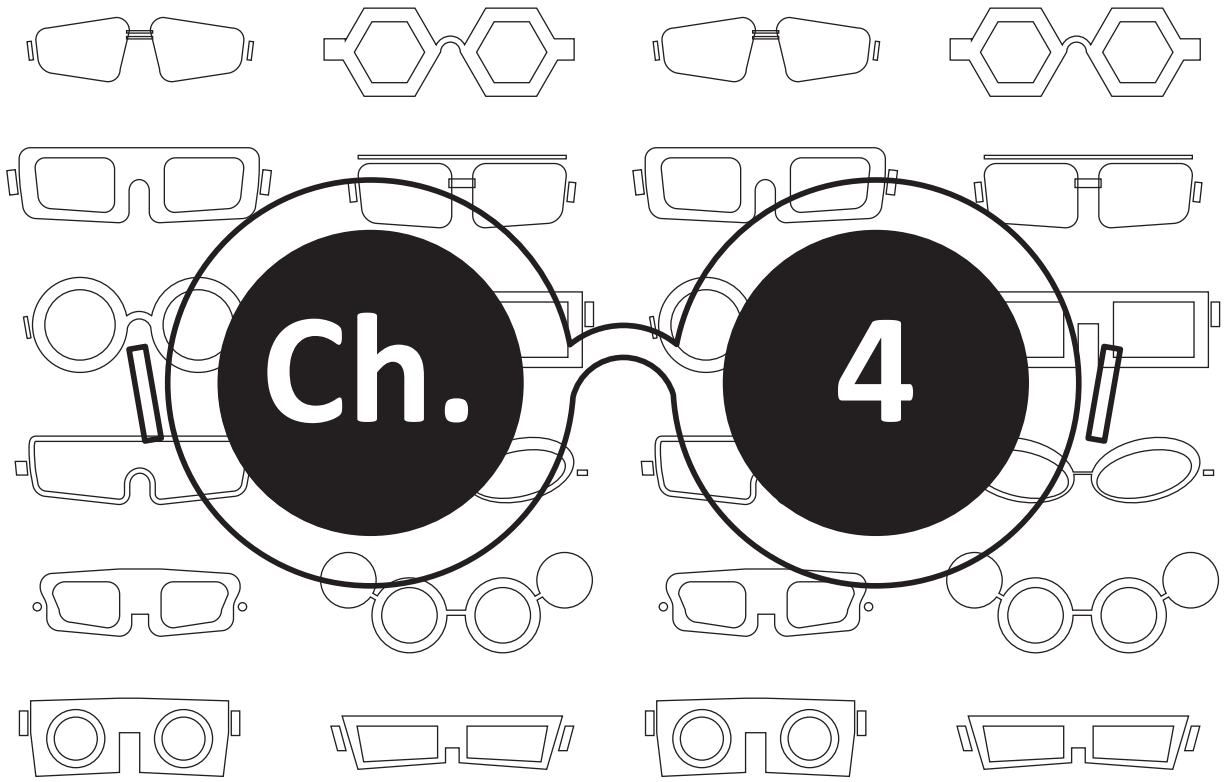


4

Measures of motivation for psychiatric treatment based on Self-Determination Theory

Jochems EC, Mulder CL, Duivenvoorden HJ, van der Feltz-Cornelis CM, & van Dam A. 2014. Measures of Motivation for Psychiatric Treatment Based on Self-Determination Theory: Psychometric Properties in Dutch Psychiatric Outpatients. Assessment, 21 (4): 494-510.



Objective

Self-Determination Theory is potentially useful for understanding reasons why individuals with mental illness do or do not engage in psychiatric treatment. The current study examined the psychometric properties of three questionnaires based on Self-Determination Theory.

Methods

The psychometric properties of the Treatment Entry Questionnaire (TEQ); Health Care Climate Questionnaire (HCCQ); and the Short Motivation Feedback List (SMFL) were investigated in a sample of 348 Dutch adult outpatients with primary diagnoses of mood, anxiety, psychotic and personality disorders using Structural Equation Modeling.

Results

Structural equation modeling showed that the empirical factor structures of the TEQ and SMFL were adequately represented by a model with three intercorrelated factors. These were interpreted as identified, introjected and external motivation. The reliabilities of the Dutch TEQ, HCCQ and SMFL were found to be acceptable but can be improved upon; congeneric estimates ranged from 0.66 to 0.94 depending on the measure and patient subsample. Preliminary support for the construct validities of the questionnaires was found in the form of theoretically expected associations with other scales, including therapist-rated motivation and treatment engagement and with legally mandated treatment.

Conclusion

The results of the current study suggest that the TEQ, SMFL and HCCQ could be valuable instruments for research on SDT in psychiatric outpatients and for clinical purposes such as discussing the patient's motivation to engage in treatment. Additionally, the study provides insights into the relations between measures of motivation based on Self-Determination Theory, the Transtheoretical Model and the Integral Model of Treatment Motivation in psychiatric outpatients with severe mental illness.

Introduction

Self-Determination Theory (SDT) is a theory on human motivation, which has been applied in various life domains including health-related behavior changes, such as tobacco dependence, diet and physical activity [64,65]. Several studies suggest that SDT could also be useful for understanding why individuals with mental illness do or do not engage in psychiatric treatment [65,124,128,129]. The primary aim of this study was to translate three measures based on SDT into Dutch and to investigate their psychometric properties in a population of patients with various primary psychiatric disorders in outpatient treatment. Additionally, we aimed to provide insights into the relations between measures of motivation based on Self-Determination Theory, the Transtheoretical Model and the Integral Model of Treatment Motivation in psychiatric outpatients with severe mental illness. In the following, we will first describe SDT and its potential utility for application in Dutch outpatient psychiatric treatment and secondly, we will describe some of the measurement issues regarding SDT measures. Finally, our hypotheses regarding the relationships between SDT measures and criterion measures will be described.

Applying Self-Determination Theory to psychiatric treatment

SDT distinguishes between different types of motivation that fall along a continuum of self-determination in the following order from most to least self-determined: intrinsic, integrated, identified, introjected, external and amotivation [65,123]. The most self-determined form of motivation is intrinsic motivation, where people feel that a certain activity or behaviour is pleasant in itself. For example, this would be the case for a patient who enters therapy purely for the pleasure of gaining a deeper personal understanding of himself [129]. Psychiatric professionals would like to see that their patients present with such intrinsic willingness to change their problems and participate in treatment processes, as this is thought to lead to positive and lasting results [65,139]. However, not many patients will present with such motivations for treatment, as treatment is usually followed with the intent to find relief of psychiatric symptoms as opposed to it being pleasant in itself or highly valued [191]. Thus, more controlled forms of motivation seem to be applicable. According to SDT, the most self-determined form of controlled motivation is integrated motivation, where a patients identifies with the importance of behaviors but also integrates this into aspects of the self [48]. An example is a patient who has completed treatment but now wants to reenter a treatment program to help him maintain changes, as he has internalized the value of sustaining mental health. That is, sustaining mental health is consistent (integrated) with his current identity [129]. Less self-integrated is identified motivation, in which a patient recognizes and accepts that treatment is useful for achieving personally relevant goals [65]. An example would be a patient who engages in treatment because he thinks it is the best way to help him live a healthy life, or a patient who finds it important to take medications as a way of preventing relapse into psychoses. This type of motivation is thus more instrumental to achieving a goal, as opposed to integrated motivation which is more aligned with the person's perception of the self. An even less self-integrated form of motivation is introjected motivation, where a patient is driven by feelings of guilt, shame or anxiety, and might feel ashamed or disappointed if he did not remain in treatment. An example would be a man who seeks treatment because he is overwhelmed by feelings of shame, as he feels that he is a bad husband for having repeatedly battered his wife. Engaging in treatment is driven by his introjected motive to improve his relationship and family situation. Finally, the most externally determined form of motivation is when a patient remains in treatment because he feels pressured to do so [65]. This could be the case for a patient who is court-ordered into treatment or a patient who enters treatment because his wife has pressured him to change his drinking problem or else seek out a divorce attorney [129]. A separate category of motivation is called "amotivation", where people experience no regulation at all over their behaviour and are very likely to drop out or reject treatment [192]. A patient who is amotived to engage in treatment is characterised by not having a clear understanding of why he does so and has a sense of hopelessness, believing that treatment will undoubtedly lead to failure and disappointment [129].

According to SDT, engaging in treatment for a long period of time and maintenance of changed behaviours over time requires that patients internalize values and skills for change [123]. That is, patients with a more internalized form of motivation will experience greater ownership of the behaviour and be more self-determined. SDT predicts that people with more internalized motives for engaging in treatment and engaging in behaviour changes will have better mental and psychical health outcomes, compared to those with more externalized motives [123]. The rationale is that behaviours that are more self-determined and intrinsically rewarding are most likely to be performed again, whereas behaviours

that are primarily driven by external motives will only be performed again in the presence of such external pressures. As Ryan and Deci [65] put it: "This is so because, to the extent that people experience treatment or change as a function of external factors, they will experience conflict and division in the process of change, rendering it unstable. Unless the client internalizes responsibility for the process of change, there can be little hope for long-term success." (p. 187).

According to SDT, the different types of motivation become manifest due to the (lack of) support for three basic psychological needs; autonomy, competence and relatedness. Autonomy refers to the need to be the originator of one's actions and the desire for volition and choice. Competence refers to the need to feel capable of achieving desired outcomes, while relatedness is the need to feel close to and understood by others [48]. SDT predicts that patients who feel that their therapeutic environment is supportive of their basic psychological needs, will more easily go through the process of internalization and identify with adhering to treatment processes and engaging in behaviour changes, leading to better treatment outcomes compared to those patients who feel thwarted in their needs [65].

Measurement issues

Several studies have found that autonomy support is positively related to treatment outcomes in psychotherapy [126,128,193], but the evidence is still rather scarce and no previous studies have reported on the utility of SDT in patients with SMI [86]. One of the reasons for this may be that there is a lack of psychometrically adequate instruments that enable the measurement of these types of motivation in mental health care services for patients with SMI. Although a scale for intrinsic motivation was developed for patients with schizophrenia by Choi, Mogami and Medalia [70], this scale has several limitations. It measures subjective experiences of interest/enjoyment, effort, value/usefulness, pressure/tension, relatedness and perceived choice, and it thus seems conceptually ambiguous since it encompasses concepts that are in fact psychological needs (such as relatedness) and behavior resulting from motivation (such as effort). Furthermore, although psychiatric patients may experience intrinsic motivation for many activities in life, it is questionable whether this applies to engaging in psychiatric treatment [86,191].

The Treatment Entry Questionnaire (TEQ) developed by Wild, Cunningham and Ryan [126] seems to represent SDT's types of motivation more adequately and was developed specifically for treatment settings. It formed internally consistent dimensions for identified motivation, introjected motivation and external motivation [126] and consists of 27 items. Although the TEQ does not measure all six different types of motivation postulated by SDT (which are intrinsic, integrated, identified, introjected, external and amotivation), its extension to more external forms of motivation might prove valuable and insightful for the treatment of patients with severe mental illness, such as those with psychotic disorders. Thus, the TEQ is in need for further theoretical and empirical investigation. In line with the development of a shortened 12-item version of the English TEQ [107], we developed a short version of the Dutch TEQ that could be easily applied in clinical practice, for example during treatment sessions as a way of discussing the patient's current motivation for treatment. This short motivation feedback list (SMFL) was also in need of psychometric testing. To measure the extent to which health care providers are autonomy supportive, the health care climate questionnaire (HCCQ) was developed [134], but application of this scale to a Dutch psychiatric outpatient population is not known to us.

Therefore, we were interested in determining the empirical factor structures of the patient-rated SMFL and TEQ, and examine the reliabilities and construct validities of the TEQ, HCCQ and SMFL in a Dutch outpatient sample. Convergent and discriminant validities for the TEQ and SMFL were determined by using clinician ratings of the TEQ and SMFL. The use of observer-rated motivation questionnaires is rare in SDT-literature, which is regretful as self-report questionnaires may be influenced by socially desirable response bias and insight into illness, especially for patients with psychiatric problems. According to Campbell and Fiske [194] convergent validity is determined by correlations between different measures for similar traits, the so-called monotrait-heteromethod correlations, while discriminant validity is supported when monotrait-heteromethod correlations exceed the heterotrait-monomethod correlations and the heterotrait-heteromethod correlations. The validities of the TEQ, SMFL and HCCQ were investigated further by using several criterion measures. For example, the TEQ was investigated in relation to clinician-rated treatment engagement and legally mandated treatment assessed at the same time, as well as to two other measures of motivation to engage in treatment. The first was a measure for motivational concepts within the Integral Model of Treatment Motivation (IM) [37]. The IM postulates six proximal predictors of the patient's motivation to engage in

treatment (MET) and is conceptually clear about the distinction between predictors of motivation, treatment motivation itself (having an intention) and treatment engagement (actual behavior) [86]. The second was based on the Transtheoretical Model (TTM) [38,44], which asserts that patients move through certain stages in the process of behavior change, and these stages are generally seen as different levels of motivation [37,86]. In a previous theoretical exploration, we have argued that the IM and TTM are mainly concerned with a quantification of the motivation concept (low or high motivation) while SDT is concerned with a more differential motivation concept (types or quality of motivation) [86].

The HCCQ and SMFL were subjected to similar tests as the TEQ. That is, the SMFL was expected to show the theoretically expected associations with the patient-rated and clinician-rated TEQ scales and substantial associations with the IM and TTM motivation scales, clinician-rated treatment engagement and with legally mandated treatment. For the HCCQ, the Helping Alliance Questionnaire (HAQ) was used as a criterion measure. The helping alliance refers to the patient's experience of the relationship with the therapist as helpful [195] and more specifically, to perceptions of the patient regarding cooperation (such as working together with the clinician to achieve goals and perception of the influence of the clinician on the healing process) and helpfulness (such as the patient's confidence in his clinician, the treatment in general and his own capacities).

Hypotheses

We hypothesized that more internalized forms of motivation measured within the SDT-framework would be associated with higher levels of motivation measured within the TTM and IM frameworks [86] and more positively associated with clinician-rated treatment engagement [126] compared to more externalized forms of motivation. We expected that patients with a legal mandate for psychiatric treatment would show higher levels of external motivation than patients without a legal mandate for treatment. It should not necessarily be so that patients with a legal mandate show lower levels of identified motivation, as these different motivational types do not exclude each other and different types may co-occur at high levels at the same time [196]. For the HCCQ, we hypothesized that the cooperation-subscale of the HAQ would be more strongly associated with autonomy support than the helpfulness-subscale, because both cooperation and autonomy support specifically refer to the patient's perception of the clinician, while helpfulness refers to a more broad perception of the usefulness of the treatment in general and the patient's competence.

Methods

Participants and procedures

We invited eleven function assertive community treatment teams (FACT teams), one outpatient forensic psychiatric team and one treatment program applying cognitive behavioral therapy to patients with mood and anxiety disorders from the Western North Brabant Mental Health Center and the Breburg Mental Health Center to participate in this study. FACT is a team treatment model where individuals with severe mental illness are offered community-based, assertive, outreaching and supportive psychiatric services [14,15]. Besides assertive outreach, the emphasis is on out-of-office interventions and home visits [14]. First, clinicians who provided care to patients with a primary diagnosis of mood or anxiety, psychotic or personality disorder were approached for participation. Second, participating clinicians were asked to provide a list of their caseload to the primary researcher, to select eligible patients. Patients were eligible for participation if they were aged at least 18 years or older, were in outpatient treatment and had a primary diagnosis of anxiety, mood, psychotic or personality disorder. Comorbid psychiatric disorders were allowed as long as the anxiety, mood, psychotic or personality disorder was the primary diagnosis. These diagnoses were obtained from the patient's medical records. Exclusion criteria were a poor understanding of the Dutch language, mental retardation and a documented history of dementia or chronic toxic encephalopathy. Eligible patients were informed and asked for their consent. Patients were asked to fill in questionnaires and provide some socio-demographic data (e.g. age, gender, education level) and information regarding their treatment (e.g. age of first contact with mental health, legal mandate, previous admissions). Clinicians were asked to fill in questionnaires regarding this patient. To study the test-retest reliabilities of the TEQ and HCCQ, 70 patients with psychotic disorders and/or personality disorders were re-administered the TEQ and HCCQ one year after the first measurement. These 70 patients were in the treatment as usual arm (control condition) of the randomized controlled trial in which the data of the current study were gathered [197]. The SMFL was administered at a later time point than the TEQ and HCCQ, as the TEQ and HCCQ were administered during the baseline assessment of the previously mentioned trial [197] while the SMFL was administered sometime after this (median = 65 days). Additionally, four repeated measures with the

SMFL were available for 52 patients with psychotic disorders and/or personality disorders, with a median of 43 days apart. The current research was approved by an official medical ethical committee and by the committees for scientific research within the two mental health institutions where the data were collected.

Measures

SDT - Treatment Entry Questionnaire

The types of motivation that are distinguished by SDT were measured with the Treatment Entry Questionnaire (TEQ) [35,126]. It was shown that the original English TEQ was reliable for external (Cronbach's α = 0.89), introjected (Cronbach's α = 0.89) and identified motivation (Cronbach's α = 0.85) in a study of patients seeking substance abuse treatment [126]. Construct validity for the English TEQ exists in the form of theoretically expected correlations between TEQ subscales and referral source (i.e. legal mandate or self-referral), social network pressures to seek treatment and problem severity [126,198]. The original TEQ consists of 27 items rated on a scale from 1 (strongly disagree) to 7 (strongly agree), and subscale scores are computed by averaging the item scores. Higher scale scores denote higher levels of that type of motivation.

For the translation of the 27 items of the original TEQ, we first adapted the wording to fit a population of patients with mental illness in psychiatric treatment. For example, where in the original TEQ the focus was upon substance abuse treatment and included items such as 'I plan to go through with a treatment program because I'll hate myself if I don't get my habit under control', we focused on a more general psychiatric treatment and adapted the item to 'I plan to go through with a treatment program because I'll hate myself if I don't get my problems under control'. Two translators performed forward translations of the original TEQ independently into Dutch and adapted the wording to fit its application to outpatient psychiatric treatment. A consensus version based on these two translations was established. This consensus version was back translated by a native English speaker (second language Dutch, also native level) and compared to the original English version. Only minor adaptations were necessary to establish the final Dutch items.

SDT - Short Motivation Feedback List

The Dutch TEQ items served as the basis for item creation and selection in the short motivation feedback list (SMFL). The SMFL contains only eight items (three items intended to measure identified motivation, two items for introjected motivation and three items for external motivation). The eight items were selected based on the highest factor loadings in the study by Wild et al. [126] on the original TEQ. The items were shortened and simplified where possible, to aid patients and clinicians in understanding them. All items begin with the phrase: 'Currently, I remain in treatment because…' followed by a specific ending (e.g. 'I can solve my problems this way' for identified motivation, 'I may not disappoint myself' for introjected motivation and 'other people think that I should' for external motivation). After these adjustments, none of the SMFL items were identical to TEQ items anymore, although they resembled them. The items are rated on a scale from 0 (totally disagree) to 10 (totally agree). Higher scale scores denote higher levels of that type of motivation. Preliminary impressions of the use of the SMFL among 13 patients with primarily anxiety and depressive symptoms receiving outpatient treatment showed that the list was comprehensible and easy to use in clinical practice. Clinicians appreciated the brevity and clarity of the items, which could function as a starting point for the discussion with the patient regarding his/her current motivation to engage in treatment.

SDT - Health Care Climate Questionnaire

The Health Care Climate Questionnaire (HCCQ) [134] was administered to patients to assess the degree in which clinicians were perceived to be autonomy supportive. Autonomy support consists of providing choices to the patient, being open to the perspective of the patient and minimizing pressure and control [65]. The HCCQ has 15 items that are scored on a Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The items are summed up to obtain a total scale score, with higher scores reflecting higher perceived autonomy support. The HCCQ was found to be reliable in a study on psychotherapy for depressed outpatients (Cronbach's α = .88) [128]. The original HCCQ was translated into Dutch by two independent translators who subsequently established a consensus version. This consensus version was back translated into English by two independent expert translators to check for discrepancies between the original version and the back-translation. On the basis of consensus between all translators, the final Dutch HCCQ was constructed.

IM - Motivation to Engage in Treatment (MET) scale

The scale for motivation to engage in treatment (MET) that is part of the Treatment Motivation Scale for forensic patients (TMS-f) [118] is a self-report questionnaire that was administered to patients to

measure their motivation for outpatient treatment. Although the TMS-f was developed within Dutch forensic psychiatric outpatient treatment, we felt that the items on the MET subscale were sufficiently general for application outside a forensic setting. The MET subscale measures commitment for treatment engagement, session attendance, treatment completion and readiness to make sacrifices necessary for treatment (e.g. money, emotional burden and lifestyle changes)[116]. The MET subscale has 16 items that are rated on a scale from 1 (totally agree) to 5 (totally disagree). The TMS-f has been found to be reliable and valid measure in a population of Dutch (forensic) outpatients with a variety of psychiatric disorders [116,118].

TTM - University of Rhode Island Change Assessment

The Dutch version of the University of Rhode Island Change Assessment (URICA-D) [170] is a self-report scale that asks a patient to rate the agreement with a particular statement reflecting a specific stage of change. It has 24 items rated on a scale from 1 (totally disagree) to 5 (totally agree) representing four stages of change: precontemplation, contemplation, action and maintenance. A total readiness for change score was calculated by subtracting the precontemplation scale score from the sum of the other three scale scores, as in a previous study in patients with severe mental illness where it was found to be sufficiently reliable and valid [57]. Higher scores reflect more readiness to change.

Helping Alliance Questionnaire

The Helping Alliance Questionnaire (HAQ) contains two subscales that refer to cooperation (5 items) and helpfulness (5 items) that are rated on a 5-point scale (completely disagree to completely agree)[182]. Both a patient and a clinician version have been developed. The patient version (HAQ-P) includes items such as "I feel the clinician understands me". The clinician version (HAQ-C) has similar items but worded differently, such as "I understand the patient". The HAQ was found to be reliable and construct validity was supported by positive correlations between the HAQ and other relationship scales and outcomes such as length of stay in detox treatment programs and noncompliance with treatment [182].

Service Engagement Scale

The Service Engagement Scale (SES) was used to assess the patient's engagement with outpatient psychiatric treatment [199]. This scale was developed specifically for assessing engagement with services in community mental health settings. It has four subscales that refer to availability, collaboration, help seeking and treatment engagement (including medication adherence). The 14 items of the SES are rated by clinicians on a 4-point scale ranging from 0 (not at all) to 3 (most of the time). For the current study, the total scale score was used. In case patients were not prescribed medications, these items were replaced with the total mean of the other items to compute the total scale score. A higher score on the SES reflects higher levels of treatment engagement. The SES has shown good psychometric properties in patients with psychotic disorders [190,199].

Statistical Analyses

The analysis strategy consisted of four steps: 1) Exploratory Factor Analysis (EFA), 2) Confirmatory Factor Analysis (CFA), 3) estimating reliabilities and 4) determining construct and criterion validity. Although Wild et al. [126] have reported on the structure of the English TEQ, several items referring to substance or drug abuse problems were rewritten in the Dutch translation to fit a population of outpatients with primarily psychiatric problems and these alterations might influence the structural model. Thus, EFA was first conducted to empirically determine the number of factors that would be appropriate for the Dutch TEQ. The fit of structural models with varying numbers of latent factors (i.e. from one factor up to four factors) was compared using robust maximum-likelihood approaches (MLR) and the chi-square statistic (χ^2). Also, the scree plot was inspected and the Kaiser criterion (eigenvalues > 1) was considered. Additionally, theoretical psychological interpretation guided the decision making, informed by the study with the original English TEQ by Wild. et al [126] in which three latent factors were retained.

Subsequently, CFA was performed on the latent factors that were identified by EFA, to establish whether the factor structure of the Dutch TEQ was similar to the original English TEQ. Although the theoretical constructs defined by SDT are distinct, it is likely that these constructs are related when translated in empirical statistical terms. Therefore, we decided to analyze all constructs simultaneously by determining the relative fits of four different models to the TEQ data. First, an uncorrelated factors model (27 items loading on three uncorrelated factors) and an intercorrelated factors model (27 items loading on three intercorrelated factors) were tested to see if three factors underlie the measured items and if these should be correlated. Thirdly, a bifactor model (27 items simultaneously loading on three uncorrelated factors and one general factor) was specified to test if a model with an independent general motivation factor and three additional

more specific motivation factors was appropriate. Although it is unlikely with EFA to obtain a bifactor model (since the aim of EFA is to obtain simple structure and the number of factors), bifactor models can be appropriate for psychological scales [200]. Finally, a second order factor model (27 items loading on three factors which loaded on a single higher order factor) was specified to test if the three motivation factors had a common underlying (higher order) construct (i.e. motivation in general). It is of great importance to identify which of these different factor models is most plausible, both clinically/theoretically and empirically/statistically. It is an important preliminary step before conducting larger structural models that also include relationships between predictors/determinants and outcome variables. For example, CFA can help to determine if there are specific motivation factors that could be used as unique predictors of treatment outcomes (in case we find most support for the uncorrelated or intercorrelated factor model), or if there are both specific factors and an independent general motivation factor, which may be hierarchically ordered (in case we find most support for the second-order factor model) or not (in case of most support for the bifactor model).

The quality of the models was evaluated in two steps. First, the analyses were rerun if the models were improperly specified. Individual fit was assessed by evaluating individual estimated parameters (e.g. no negative variances or correlations of ≥ |1.00 | and no parameter estimates with values that contradicted psychological theoretical interpretation were allowed). Second, overall fit was assessed by using the chi-square statistic (χ2), χ2/df, Bentler's Comparative Fit Index (CFI), Tucker Lewis Index (TLI) and the root mean square error of approximation (RMSEA). The following rules of thumb were used to specify cutoff points for fit indices [201]: CFI/TLI > 0.95 (good fit), 0.90-0.95 (borderline fit) and <0.90 (poor fit); RMSEA <0.06 (good fit), 0.06 - 0.08 (fair fit), 0.08-0.10 (borderline fit) and >0.10 (poor fit). Also, the fit indices of Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC) and Sample-Size Adjusted Bayesion Information Criterion (S-BIC) were inspected. Furthermore, in search for the most parsimonious assessment with the TEQ, the TEQ items with a substantial loading on a certain factor (i.e. ≥ |0.40|) and low loadings on the other factors (i.e. ≤ | 0.20 |) were considered as "factor-pure" items. We performed secondary (and similar) Confirmatory Factor Analyses on only these factor-pure items to determine the final structural model of the Dutch TEQ. For all models, robust maximum likelihood estimation (MLR) as implemented in Mplus [202] was used because of non-normality of the frequency distribution of the items. The factor structure of the SMFL was established with the same procedure, by first conducting EFA to determine the number of factors. The relative fits of models with one, two or three latent factors were evaluated. Subsequently, we fitted the following models in CFA: a general factor model; an uncorrelated factors model; an intercorrelated factors model; a bifactor model and a second order factor model.

The reliabilities of the TEQ, SMFL and HCCQ were determined by the computation of Cronbach's α and either tau-equivalence or congeneric estimates of reliability. The reliability of the composite of items is a function of the square of the sum of the factor loadings on one factor, as this decomposes the observed variance into a systematic and an error component. Although Cronbach's α is the most commonly used measure of internal consistency, it only yields an unbiased estimate of the reliability if the factor loadings and error variances of the items are equal [203]. If however, only factor loadings are equal but error variances are not, a tau-equivalence estimate for reliability is more appropriate and if both factor loadings and error variances are heterogeneous, the congeneric reliability estimate is most appropriate [203]. Therefore, additional to reporting traditional Cronbach's α's, either tau-equivalent or congeneric estimates of reliability will be reported where appropriate. Also, test-retest correlations were computed for the TEQ. For the interpretation of the reliability coefficients, we used the guidelines of Nunnally and Bernstein [204] who stated that a value of 0.70 is sufficient for early stages of research but a reliability coefficient of 0.80 or higher should be attempted, while reliability coefficients of 0.90 or higher are desirable when important decisions are to be made with the test scores. Test-retest reliabilities for the scales were explored by computing Pearson correlations (in case of normally distributed data) or Spearman rank correlations (for non-normally distributed data) between the first and second assessment. For the SMFL, intraclass correlation coefficients (ICCs) were computed to estimate the test-retest stability over four consecutive SMFL assessments, using a two-way random model of consistency.

Validity was investigated by computing Pearson correlations (in case of linear normally distributed data) or Spearman rank correlations (for non-normally distributed data) between all patient-rated and clinician-rated scales. The conventional guidelines by Cohen [205] were used for the interpretation of the correlation coefficients: r ≤ |0.29| as weak, |0.30 to 0.49| as moderate and r ≥ |0.49| as large.

Table 1. Patient characteristics for the total sample and diagnostic groups

	Total patient sample n = 349	Psychotic disorders n= 199	Personality disorders n = 95	Mood and Anxiety disorders n = 55
Age, mean (SD)	43.3 (10.6)	43.0 (10.2)	**46.0 (10.2)***	**39.8 (11.5)***
Male gender, n (%)	200 (57.5)	**133 (66.2)***	**46 (50.0)***	**21 (38.5)*** [A]
Education level, n (%)				
- No education/elementary	129 (37.1)	76 (37.8)	31 (33.7)	22 (40.0)
- Secondary school	144 (41.4)	77 (38.3)	47 (51.1)	20 (36.4)
- Upper high school and over	67 (19.3)	47 (23.4)	12 (13.0)	8 (14.5)
- Unknown	8 (2.3)	1 (0.5)	2 (2.2)	5 (9.1)
Country of birth, n (%)				
- Netherlands	286 (82.2)	158 (78.6)	81 (88.0)	47 (85.5)
- Morocco	15 (4.3)	10 (5.0)	1 (1.1)	4 (7.3)
- Netherlands Antilles	6 (1.7)	5 (2.5)	1 (1.1)	0 (0)
- Other	39 (11.2)	28 (13.9)	9 (9.8)	2 (3.6)
- Unknown	2 (0.6)	0 (0)	0 (0)	2 (3.6)
Treatment duration (months)				
mean (SD)	34.3 (25.5)	**37.3 (24.2)***	**42.1 (25.9)***	**8.3 (8.47)*[B]**
median (IQR)	29 (17 to 48)	30 (20.5 to 52)	37.5 (26.3 to 53)	5.5 (3 to 12)
GAF-score, mean (SD)	57.6 (8.3)	56.7 (9.0)	58.3 (7.5)	59.7 (6.2)
Legal mandate, N (% yes)	24 (6.9)	13 (6.5)	**11 (12.0)***	**0 (0)***
One or more previous admissions, n, (% yes)	234 (67.2)	**162 (80.6)***	**65 (70.7)***	**7 (12.7)*[B]**

Note: percentages reflect column percentages. * $p < 0.017$ (The conventional p-value of $\alpha = 0.05$ was divided by the number of groups (3) in the comparison). [A] All three diagnostic groups significantly differed from each other. [B] Patients with mood and anxiety disorders significantly differed from the other two diagnostic groups.

Furthermore, the mean scores on the TEQ subscales were compared between patients who were rated by their clinicians as having high levels of treatment engagement (measured by the SES) to those with low levels, and between patients with and without legally mandated treatment. Since the SES scores showed a skewed distribution, the SES was dichotomized at the median score. SES ≤30 was interpreted as low treatment engagement and SES >30 as high treatment engagement. Logistic regression analyses were performed using the TEQ scales as predictors for the dichotomized SES and legally mandated treatment (yes/no). Statistical tests were performed using SPSS version 21 for Windows (SPSS Inc., Chicago, IL, USA) and Mplus version 7.0 [202].

Results

A total of 72 clinicians agreed to participate of which 49 were female (68%). Their mean age was 43 years old (SD = 10.81) and they had a mean of 15.4 years of clinical working experience in mental health services (SD = 9.32). From their caseloads, a total of 349 patients agreed to participate. Table 1 shows an overview of the patient characteristics. Within the subsample of patients with psychotic disorders, the majority of patients were diagnosed with schizophrenia (48%), schizoaffective disorder (16%) or psychotic disorder not otherwise specified (24%). Within the subsample of personality disorders, 40% had a borderline personality disorder, 13% had antisocial personality disorder and 26% had a personality disorder not otherwise specified. Within the subsample of patients with mood and anxiety disorders, 46% had an anxiety disorder.

Exploratory Factor Analyses

EFA analyses on the 27 items of the TEQ revealed superior fit for a structural model with three latent factors (χ^2=534.64, df=273, p=0.0000, χ^2/df=1.96, CFI=0.90; TLI=0.87; RMSEA=0.05), as opposed to a model with one latent factor (χ^2=1762.74, df=324, p=0.0000, χ2/df=5.44, CFI=0.46; TLI=0.42; RMSEA=0.11) or two latent factors (χ^2=693.50, df= 298, p=0.0000, χ2/df=2.33, CFI=0.85; TLI=0.83; RMSEA=0.06). A three factor model was most consistent with the original English version of the TEQ [126] and these three factors could theoretically be interpreted as representing identified, introjected and external motivation.

The SMFL was subjected to EFA, in which a superior fit for a model with three latent factors was also found (χ^2=7.16, df=7, p=0.4127, χ2/df=1.02, CFI=0.99; TLI=0.99; RMSEA=0.01), as opposed to two latent factors (χ2=35.91, df =13, p=0.0006, χ2/df=2.76, CFI=0.92; TLI=0.83; RMSEA=0.11) or one latent factor (χ2=113.14, df=20, p=0.0000, χ2/df=5.66, CFI=0.68; TLI=0.55; RMSEA=0.19). Theoretically, SMFL-items 1 and 2 were interpreted as identified motivation, items 3, 5, and 7 were interpreted as introjected

motivation and items 6 and 8 as external motivation. Item 4 was discarded as it did not load substantially on any of the retained factors and could not be interpreted theoretically as belonging to any of these three factors. In the following analyses, these three SMFL-subscales were used.

Confirmatory Factor Analyses

CFA analysis of the 27 items of the TEQ (see Table 2) revealed superior fit for the bifactor model (χ^2=613.30, df= 299, p=0.0000, χ^2/df=2.05; CFI=0.85; TLI=0.82; RMSEA=0.06), compared to the other models. CFA did not converge for the second order factor model, even after a loosening of constraints on the model and enlarging the number of iterations. Secondly, only the TEQ items with a substantial loading on a relevant factor (i.e. ≥ .40|) and low loadings on the other factors (i.e. ≤ |.20|) were brought into a secondary (and similar) CFA (see Table 2). A total of 18 items were selected, 6 items per factor. Again, the bifactor model showed superior fit (χ^2 = 249.65, df = 118, p = 0.0000, χ^2/df = 2.12; CFI = 0.90; TLI = 0.87; RMSEA = 0.06), compared to the other models. The information criteria (AIC, BIC, S-BIC) were also lowest for the bifactor model, which supports that this model was most plausible. However, subsequent reliability analysis on the bifactor model revealed that several subscales had inadequate reliability estimates for both the total sample and subsamples (e.g. congeneric estimates of 0.10 and 0.18). Since our goal was to establish reliable sum scores for the subscales of the TEQ, we chose to continue with the next best fitting model, which was the intercorrelated factors model. This model had borderline acceptable fit (χ^2=315.18, df=135, p=0.0000, χ^2/df=2.33; CFI=0.86; TLI=0.84; RMSEA=0.06) but was theoretically more plausible than the bifactor model solution and reliability estimates for all patient samples were acceptable (see Table 3). The item cross-loadings were inspected for all confirmative analyses and no indication was found for any cross-loading. Standardized coefficients (factors loadings) between the observed measures (18 TEQ items) and latent variables (motivation factors) for the intercorrelated factors model are shown in Figure 1. The three factors in the final model were interpreted as identified motivation, introjected motivation and external motivation. The average variance explained (R^2) by the final model was 35% (R^2 for the items ranging from 11% to 56%). In all subsequent analyses, the TEQ 18-item-version was used.

Regarding the structure for the SMFL, CFA on the seven items revealed that the intercorrelated factors model had relatively better fit compared to the other models.

Reliability

Internal consistencies of the three questionnaires for the total patient sample are summarized in Table 3. As the assumptions for tau-equivalence estimates of reliabilities were never met, these were not reported. We found acceptable reliabilities for the TEQ subscales of identified motivation (congeneric estimate = 0.78), introjected motivation (congeneric estimate = 0.72) and external motivation (congeneric estimate = 0.75) in the total sample. Reliabilities did not vary substantially between subgroups, except for the external motivation subscale that was lower for the patients with personality disorders (congeneric estimate = 0.69). Test-retest reliability of the TEQ was determined by correlating the first measurement with the measurement after 12 months of community mental health treatment in a sample of patients with psychotic and personality disorders (N= 70). The test-retest correlations for the subscales were acceptable; r = 0.58 (p<0.01) for internal motivation, r = 0.60 (p<0.01) for introjected motivation and r = 0.45 (p <0.01) for external motivation.

The short motivation feedback list had adequate internal consistency in the total sample for identified motivation (congeneric estimate = 0.81), introjected motivation (congeneric estimate = 0.93) and external motivation (congeneric estimate = 0.84) at the first administration. The reliability for external motivation varied between subgroups; it was questionable for patients with mood and anxiety disorders. For 52 patients with personality and/or psychotic disorders, the SMFL was administered four times with a median of 43 days apart. The ICCs for identified, introjected and external motivation were 0.69, 0.89 and 0.91, respectively. Table 4 shows that the Spearman correlations increased with the number of times the SMFL was administered. Furthermore, the introjected and external motivation scales consistently showed strong intercorrelations over time, while identified motivation only showed moderate correlations to introjected motivation when it was assessed at the same time.

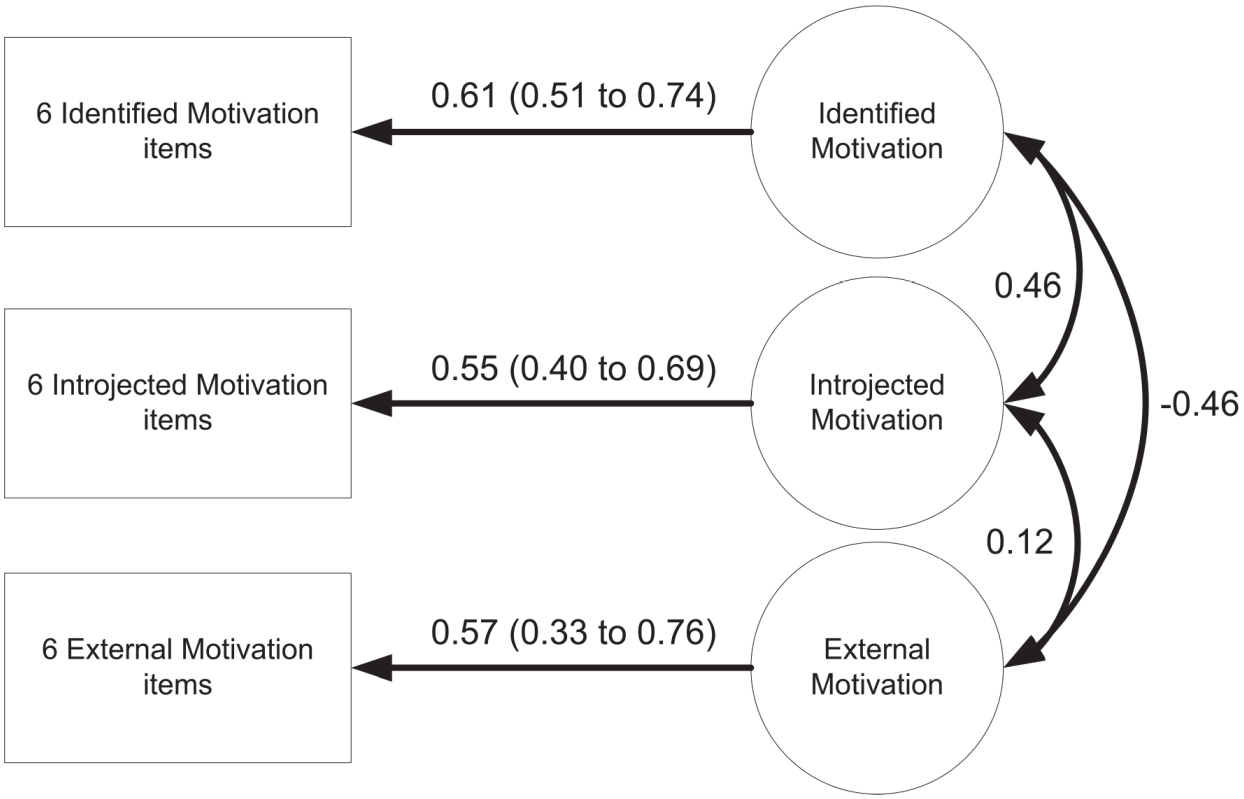
The HCCQ showed excellent internal consistency for the total sample (congeneric estimate = 0.93), and also for all subsamples. The test-retest correlation for the HCCQ after one year was r = 0.58 (p<0.01).

Table 2. Confirmatory Factor Analyses for the TEQ and SMFL

Questionnaire	Model	χ^2	df	p-value	χ^2 / df	CFI	TLI	RMSEA	90% C.I. for RMSEA	AIC	BIC	S-BIC
TEQ (27 items)	Uncorrelated factors	984.96	325	0.0000	3.03	0.68	0.66	0.08	0.071 to 0.082	37810.51	38118.46	37864.67
	Intercorrelated factors	830.65	322	0.0000	2.58	0.76	0.74	0.07	0.062 to 0.073	37638.04	37957.54	37694.23
	Bifactor	613.30	299	0.0000	2.05	0.85	0.82	0.06	0.049 to 0.061	37409.43	37817.46	37481.20
	Second order factor	d.n.c.										
TEQ (18 items)	Uncorrelated factors	423.86	138	0.0000	3.07	0.78	0.75	0.08	0.069 to 0.086	24898.85	25095.16	24933.37
	Intercorrelated factors	315.18	135	0.0000	2.33	0.86	0.84	0.06	0.053 to 0.071	24779.37	24987.23	24851.93
	Bifactor	249.65	118	0.0000	2.12	0.90	0.87	0.06	0.047 to 0.066	24724.88	24998.18	24772.95
	Second order factor	360.59	135	0.0000	2.67	0.83	0.80	0.07	0.061 to 0.078	24828.60	25036.46	24865.16
SMFL (7 items)	Uncorrelated factors	d.n.c.										
	Intercorrelated factors	24.55	9	0.0035	2.72	0.92	0.82	0.11	0.060 to 0.167	4464.64	4540.37	4458.12
	Bifactor	23.42	7	0.0014	3.35	0.92	0.75	0.13	0.075 to 0.192	4468.43	4549.98	4461.40
	Second order factor	d.n.c.										

Note: TEQ = Treatment Entry Questionnaire; SMFL = Short Motivation Feedback List; χ^2 = chi-square statistic; df = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA = root mean square error of approximation; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; S-BIC = Sample-Size Adjusted Bayesion Information Criterion; d.n.c. = did not converge.

Figure 1. Standardized coefficients (factor loadings) obtained with the intercorrelated factors model for the Treatment Entry Questionnaire (TEQ).



Note: To avoid complexity of the figure, the error variances are not shown here. Numbers between brackets represent the range of the item loadings.

Validity

Table 5 shows Spearman correlations that were computed between the subscales of the TEQ, HCCQ, SMFL and the MET, RTC, HAQ and SES for the total sample. To emphasize that the MET and RTC scales were based on theoretical perspectives different from SDT, we will use their theory abbreviations in front of the scale names from this point onward. That is; IM-MET for the motivation scale based on the Integral Model of Treatment Motivation and TTM-RTC for the motivation scale based on the Transtheoretical Model.

Concurrent and discriminant validity

Table 5 shows the patterns of monomethod correlations (gray cells) and the heteromethod correlations (black cells) for the TEQ and SMFL. The inter-correlations of the TEQ subscales showed similar patterns for both methods. That is, identified and external motivation were moderately negatively correlated and introjected motivation showed stronger positive correlation with identified motivation than with external motivation. For the SMFL, the general patterns for both methods were also comparable, although the correlations were stronger for clinician-ratings than patient-ratings. Contrary to theoretical expectations however, identified and external motivation were not negatively correlated but marginally positive.

The convergent validities for the TEQ and SMFL are represented by the correlations on the diagonal of the black boxes within Table 5. These monotrait-heteromethod correlations generally showed moderate correlations (between r = 0.26 and r = 0.30), although the TEQ introjected scale showed weak correlation (r = 0.15). Discriminant validities for the TEQ and SMFL were supported by the finding that generally, higher correlations were found between similar motivation concepts than between different motivation concepts. That is, all monotrait-heteromethod correlations exceeded the heterotrait-heteromethod correlations except for the external motivation scale of the SMFL rated by the clinician, which showed higher correlation with patient-rated introjected than external motivation.

Criterion validity for the TEQ

Regarding associations between the TEQ and measures for the quality of the therapeutic relationship, most theoretically expected associations were confirmed. It was found that identified motivation showed substantial positive correlation with autonomy support measured by the HCCQ and with both subscales of the patient-rated HAQ. Correlations were stronger for patient-rated TEQ than clinician-rated TEQ. Introjected motivation rated by patients showed weak positive correlation with HCCQ ($p=0.13$, $p<0.05$) and the external motivation subscale showed moderate negative association with the HCCQ ($r_s = -0.24$, $p<0.01$). The correlations of clinician-rated TEQ with the therapeutic relationship scales showed a similar pattern but were less pronounced.

The TEQ scores were also correlated with motivation measures based on the two other theories. Regarding associations with the IM-MET-scale, TEQ identified motivation showed weak positive correlation and introjected motivation showed no association for both methods. External motivation showed weak negative association with IM-MET ($r_s = -0.21$, $p<0.01$) when rated by patients, but no association between clinician-rated external motivation and IM-MET was found. Furthermore, for both TEQ methods it was found that identified motivation showed strongest positive correlation with TTM-RTC, introjected motivation showed less strong positive association and external motivation showed moderate negative association.

In line with theoretical expectations, treatment engagement as measured with the SES was positively correlated with clinician-rated TEQ identified motivation ($r_s = 0.58$, $p<0.01$), less strong with introjected motivation ($r_s = 0.18$, $p<0.01$) and negatively with external motivation ($r_s = -0.15$, $p<0.05$). For patient-rated TEQ scales however, neither introjected motivation nor external motivation was associated with SES. The means of the TEQ scales were compared between those who were rated by their clinicians as having high levels of treatment engagement (i.e. SES-score > 30) to those who were rated as having low levels (i.e. SES-score ≤ 30). Table 6 shows that patients who rated themselves higher on identified motivation were rated by their clinicians as having high levels of treatment engagement at the same time (mean difference -2.61, $p < 0.01$).

Table 7 shows results from independent samples T-tests that were performed to investigate the relationship between means on the TEQ subscales and legal mandate for treatment. Patients who had a legal mandate for psychiatric treatment scored significantly lower on identified motivation and significantly higher on external motivation, both for clinician-rated and patient-rated TEQ scales.

Table 3. Descriptive statistics and reliabilities for the SDT measures in the total client sample and diagnostic groups

Questionnaires	Total patient sample n= 348	Psychotic disorders n = 201	Personality disorders n = 92	Mood and Anxiety disorders n = 55
TEQ identified motivation				
- Mean (S.D.)	34.5 (7.13)	33.53 (7.56)	34.6 (6.77)	37.9 (4.71)
- Internal consistency				
- Cronbach's α	0.78	0.78	0.76	0.74
- Congeneric estimate	0.78	0.75	0.82	0.86
- Test-retest reliability (one year)	0.58** (n = 70)	0.60** (n = 48)	0.53* (n = 22)	
TEQ introjected motivation				
- Mean (S.D.)	22.2 (9.24)	22.3 (9.37)	23.1 (9.33)	20.3 (8.48)
- Internal consistency				
- Cronbach's α	0.77	0.76	0.78	0.78
- Congeneric estimate	0.72	0.71	0.73	0.76
- Test-retest reliability (one year)	0.60** (n = 70)	0.58** (n =48)	0.62** (n = 22)	
TEQ external motivation				
- Mean (S.D.)	15.85 (8.41)	18.4 (8.39)	14.5 (7.73)	8.7 (3.57)
- Internal consistency				
- Cronbach's α	0.74	0.71	0.69	0.58
- Congeneric estimate	0.75	0.74	0.69	0.74
- Test-retest reliability (one year)	0.45** (n = 70)	0.48** (n = 48)	0.30 (n = 22)	
SMFL identified motivation				
- Mean (S.D.)	13.54 (4.02)	13.24 (3.86)	13.19 (4.24)	14.00 (4.07)
- Internal consistency				
- Cronbach's α	0.76	0.85	0.72	0.71
- Congeneric estimate	0.81	0.89	0.85	0.85
SMFL introjected motivation				
- Mean (S.D.)	14.01 (7.14)	14.20 (7.75)	11.38 (6.65)	15.33 (6.53)
- Internal consistency				
- Cronbach's α	0.63	0.67	0.63	0.54
- Congeneric estimate	0.93	0.90	0.92	0.91
SMFL external motivation				
- Mean (S.D.)	6.89 (5.18)	8.28 (5.93)	6.16 (4.46)	6.04 (4.63)
- Internal consistency				
- Cronbach's α	0.70	0.84	0.56	0.54
- Congeneric estimate	0.84	0.88	0.74	0.66
HCCQ total scale score				
- Mean (S.D.)	88.56 (15.06)	86.02 (16.17)	89.73 (14.01)	95.85 (8.82)
- Internal consistency				
- Cronbach's α	0.93	0.93	0.92	0.91
- Congeneric estimate	0.93	0.94	0.93	0.91
Test-retest reliability (one year)	0.58**(n= 131)	0.58** (n = 84)	0.56** (n = 47)	

* p < 0.05, ** p < 0.01 TEQ = Treatment Entry Questionnaire; SMFL = Short Motivation Feedback list; HCCQ = Health Care Climate Questionnaire.

Table 4. Test-retest spearman correlations (below diagonal) and corresponding 95% confidence intervals (above diagonal) of four assessments with the patient-rated SMFL scales

	IDEN 1	IDEN 2	IDEN 3	IDEN 4	INTRO 1	INTRO 2	INTRO 3	INTRO 4	EXT 1	EXT 2	EXT 3	EXT 4
IDEN 1	-	0.06 to 0.44	0.05 to 0.52	-0.03 to 0.56	0.20 to 0.53	-0.17 to 0.29	-0.22 to 0.25	-0.26 to 0.31	-0.03 to 0.35	-0.17 to 0.27	-0.26 to 0.20	-0.25 to 0.33
IDEN 2	**0.26***	-	0.14 to 0.62	0.07 to 0.64	0.07 to 0.48	0.18 to 0.57	-0.19 to 0.34	-0.32 to 0.35	-0.22 to 0.24	0.01 to 0.43	-0.09 to 0.43	-0.44 to 0.16
IDEN 3	**0.31***	**0.40***	-	0.22 to 0.68	0.28 to 0.64	-0.03 to 0.45	0.05 to 0.52	-0.03 to 0.41	-0.09 to 0.41	-0.22 to 0.28	-0.07 to 0.40	-0.24 to 0.28
IDEN 4	**0.30***	**0.37****	**0.48****	-	0.03 to 0.60	-0.21 to 0.43	-0.20 to 0.15	0.03 to 0.62	-0.29 to 0.23	-0.46 to 0.15	-0.31 to 0.28	-0.17 to 0.40
INTRO 1	**0.37***	**0.28****	**0.48****	**0.32***	-	0.33 to 0.69	0.31 to 0.74	0.36 to 0.81	0.49 to 0.74	0.23 to 0.63	0.36 to 0.74	0.35 to 0.76
INTRO 2	0.06	**0.39****	0.21	0.09	**0.53****	-	0.46 to 0.79	0.49 to 0.87	0.26 to 0.63	0.51 to 0.79	0.63 to 0.86	0.37 to 0.81
INTRO 3	0.02	0.08	**0.30***	0.08	**0.54****	**0.65****	-	0.45 to 0.87	0.26 to 0.66	0.34 to 0.73	0.54 to 0.84	0.43 to 0.82
INTRO 4	0.03	0.03	0.21	**0.33***	**0.63****	**0.72****	**0.69****	-	0.09 to 0.61	0.22 to 0.74	0.48 to 0.84	0.64 to 0.90
EXT 1	0.17	-0.00	0.18	-0.03	**0.63****	**0.45****	**0.48****	**0.37****	-	0.38 to 0.71	0.42 to 0.79	0.38 to 0.78
EXT 2	0.04	**0.22***	0.03	-0.17	**0.45****	**0.67****	**0.56****	**0.49****	**0.56****	-	0.54 to 0.83	0.44 to 0.82
EXT 3	-0.04	0.16	0.17	-0.02	**0.57****	**0.77****	**0.71****	**0.70****	**0.63****	**0.71****	-	0.69 to 0.93
EXT 4	0.04	-0.13	0.02	0.12	**0.60****	**0.62****	**0.66****	**0.80****	**0.61****	**0.67****	**0.84****	-

* p < 0.05, ** p < 0.01 (two-tailed). IDEN = identified motivation, INTRO = introjected motivation, EXT = external motivation.

Table 5. Spearman correlations between SDT measures and criterion measures rated by patients and clinicians

		PATIENT RATED SCALES											CLINICIAN RATED SCALES							
		SDT							IM	TTM			SDT							
		TEQ ID	TEQ IN	TEQ EX	HCCQ	SMFL ID	SMFL IN	SMFL EX	MET	RTC	HAQ c	HAQh	TEQ ID	TEQ IN	TEQ EX	SMFL ID	SMFL IN	SMFL EX	HAQ c	HAQh
PATIENT-RATED SCALES	TEQ ID	-																		
	TEQ IN	**0.35***	-																	
	TEQ EX	**-0.34***	**0.16***	-																
	HCCQ	**0.49***	**0.13***	**-0.25***	-															
	SMFL ID	**0.24***	0.05	-0.15	**0.22***	-														
	SMFL IN	**0.22***	**0.46***	0.05	0.04	**0.34***	-													
	SMFL EX	-0.05	**0.36***	**0.33***	-0.11	0.09	**0.58***	-												
	MET	**0.18***	0.04	**-0.21***	**0.34***	0.16	-0.04	-0.09	-											
	RTC	**0.50***	**0.25***	**-0.30***	**0.33***	**0.31***	0.18	-0.01	**0.13***	-										
	HAQc	**0.47***	**0.21***	**-0.12***	**0.67***	**0.25***	0.18	0.15	**0.26***	**0.34***	-									
	HAQh	**0.25***	0.03	-0.03	**0.43***	**0.25***	**0.24***	0.13	**0.19***	**0.13***	**0.59***	-								
CLINICIAN-RATED SCALES	TEQ ID	**0.29***	**0.13***	-0.10	**0.30***	0.07	-0.10	-0.08	**0.17***	**0.21***	**0.29***	**0.18***	-							
	TEQ IN	**0.16***	**0.15***	-0.04	**0.17***	**0.22***	0.01	0.03	0.08	**0.14***	**0.15***	0.05	**0.43***	-							
	TEQ EX	**-0.20***	0.03	**0.30***	-0.05	0.03	0.16	0.09	-0.09	**-0.24***	-0.00	**0.14***	**-0.30***	0.12	-						
	SMFL ID	0.15	-0.06	**-0.21***	**0.22***	**0.28***	**0.18***	-0.06	0.16	0.16	0.10	0.02	**0.27***	**0.33***	0.05	-					
	SMFL IN	**0.30***	0.07	-0.11	**0.20***	**0.24***	**0.26***	0.11	-0.01	**0.23***	0.15	0.13	**0.30***	**0.29***	0.09	**0.56***	-				
	SMFL EX	0.15	**0.17***	0.07	0.07	**0.17***	**0.33***	**0.28***	-0.10	0.09	0.12	**0.22***	0.12	0.03	**0.25***	**0.20***	**0.55***	-		
	HAQc	**0.14***	0.01	0.02	**0.24***	0.13	-0.10	-0.10	**0.16***	0.05	**0.24***	**0.16***	**0.47***	**0.16***	-0.11	**0.27***	**0.26***	0.02	-	
	HAQh	**0.19***	0.04	0.03	**0.17***	0.04	-0.10	**-0.21***	**0.18***	0.06	**0.22***	**0.25***	**0.50***	**0.23***	-0.08	**0.21***	**0.19***	0.01	**0.61***	-
	SES	**0.25***	0.04	-0.05	**0.21***	0.13	-0.11	-0.16	**0.28***	0.09	**0.29***	**0.30***	**0.58***	**0.18***	**-0.15***	**0.25***	**0.16**	-0.04	**0.55***	**0.54***

* p < 0.05, (two-tailed). Gray cells represent monomethod correlations. Black cells represent heteromethod correlations. SDT = Self-Determination Theory, IM = Integral Model of treatment motivation, TTM = Transtheoretical Model, TEQ = Treatment Entry Questionnaire, ID = identified motivation, IN = introjected motivation, EX = external motivation, HCCQ = Health Care Climate Questionnaire, SMFL = Short Motivation Feedback List, MET = Motivation to Engage in Treatment scale, RTC = Readiness to Change, HAQc = Helping Alliance Questionnaire cooperation, HAQh= Helping Alliance Questionnaire helpfulness, SES = Service Engagement Scale.

Criterion validity for the SMFL

Not all of the theoretically expected associations between the SMFL and the TEQ subscales were confirmed. For example; looking at patient-rated scales it can be seen that while SMFL identified motivation correlated most positive with TEQ identified motivation (r_s = 0.24, p<0.01) and the SMFL introjected scale showed strongest positive association with TEQ introjected motivation (r_s =0.46, p<0.01), these correlational patterns were not found for clinician-rated scales. Other mixed findings include that patient-rated SMFL scales showed almost no significant associations with clinician-rated TEQ scales, although they were positively associated with most clinician-rated SMFL-scales. For both methods it was found that the SMFL external scale was most strongly positively associated with TEQ introjected motivation instead of with TEQ external motivation. Clinician-rated SMFL scales showed an unexpected pattern of correlations with patient-rated TEQ scales as clinician-rated SMFL introjected motivation was positively correlated with patient-rated TEQ identified motivation (r_s = 0.30, p<0.01) and clinician-rated SMFL external motivation was weakly positively correlated with patient-rated introjected motivation (r_s = 0.17, p<0.01).

Looking at associations between the SMFL and measures for the therapeutic relationship, the findings were generally consistent with expectations. For the HCCQ, both patient-rated and clinician-rated SMFL identified motivation showed significantly positive correlations and, additionally, so did clinician-rated introjected motivation. Three positive correlations were found of patient-rated SMFL with patient-rated HAQ, but no positive correlations were found with clinician-rated HAQ. Vice versa, clinician-rated SMFL scales showed several significant positive correlations with clinician-rated HAQ but only one with patient-rated HAQ.

Finally, regarding associations between the SMFL and motivation scales from the other two theories it was found that patient-rated identified motivation was positively associated with TTM-RTC (r_s = 0.31, p<0.01) and so was clinician-rated

Table 6. Relationship between TEQ subscales and clinician-rated treatment engagement

	Treatment Engagement (SES)					
TEQ subscale Means (S.D.)	**Low (SES ≤ 30)** N = 130	**High (SES > 30)** N = 113	**Mean difference (95% C.I.)**	**T**	**df**	**p-value**
Patient-rated TEQ						
Identified motivation	32.89 (7.65)	35.50 (6.30)	-2.61 (-4.40 to -0.82)	-2.92	240	**0.004**
Introjected motivation	23.25 (9.13)	23.31 (9.70)	1.20 (-2.45 to 2.30)	-0.06	232	0.952
External motivation	18.15 (8.76)	17.48 (8.21)	0.67 (-1.49 to 2.82)	0.61	240	0.540
Clinician-rated TEQ						
Identified motivation	26.67 (7.01)	32.97 (4.76)	-6.29 (-7.70 to -4.87)	-8.77	259	**0.000**
Introjected motivation	20.36 (7.28)	22.09 (6.58)	-1.72 (-3.39 to -0.05)	-2.03	270	**0.043**
External motivation	21.34 (7.93)	19.09 (7.47)	2.24 (0.39 to 4.09)	2.39	270	**0.018**

Table 7. Relationship between TEQ subscales and legal mandate for treatment

	Legal mandate					
TEQ subscale Means (S.D.)	**Yes** (N = 24)	**No** (N = 267)	**Mean difference (95% C.I.)**	**T**	**df**	**p-value**
Patient-rated TEQ						
Identified motivation	29.83 (8.83)	34.24 (7.08)	4.41 (1.37 to 7.44)	2.86	289	**0.005**
Introjected motivation	19.83 (8.85)	22.83 (9.37)	2.99 (-0.91 to 6.91)	1.51	289	0.133
External motivation	20.45 (7.22)	16.89 (8.42)	-3.57 (-7.06 to -0.07)	-2.01	289	**0.045**
Clinician-rated TEQ						
Identified motivation	23.68 (9.71)	30.09 (6.30)	6.41 (2.04 to 10.77)	3.04	23	**0.006**
Introjected motivation	19.54 (9.98)	21.31 (6.83)	1.76 (-2.71 to 6.26)	0.81	23	0.425
External motivation	26.95 (5.87)	19.70 (7.64)	-7.25(-10.00 to -4.51)	-5.42	27	**0.000**

introjected motivation (r_s = 0.23, p<0.05). However, neither patient-rated nor clinician-rated SMFL scales were associated with IM-MET.

Criterion validity for the HCCQ

The HCCQ showed exceptionally strong positive association with the patient-rated HAQ cooperation (r_s = 0.71, p <0.01) and strong correlation with patient-rated HAQ helpfulness (r_s = 0.47, p<0.01). The HCCQ showed weaker associations with the clinician-rated HAQ; r_s = 0.24 (p <0.01) for cooperation and r_s = 0.18 (p<0.01) for helpfulness, which suggests that the correlations between patient-rated scales are likely inflated due to common method variance. Consistent with theoretical expectations, the HCCQ showed somewhat stronger association with patient-rated TEQ identified motivation (r_s = 0.49, p<0.01) than with the IM-MET-scale (r_s = 0.34, p<0.01) and the TTM-RTC score (r_s = 0.33, p<0.01). Finally, the HCCQ showed a positive association with the SES (r_s = 0.23, p<0.01), which was less strong than the associations between the different HAQ-scales and the SES.

Discussion

The current study investigated the psychometric properties of the TEQ, HCCQ and SMFL in a Dutch sample of psychiatric outpatients and generally found support for the use of these instruments for further research applications.

Factor structures

The factor structure for the TEQ was best represented by an intercorrelated factors model with three factors, which were interpreted as identified, introjected and external motivation. This structure was consistent with the original English TEQ [126]. In search for the most parsimonious assessment with the TEQ, it was found that a scale with 18 items (as opposed to the original 27 items), represented by 6 items per subscale showed best fit. All 18 items loaded onto the same factors as the original English TEQ, except the item 'I remain in treatment because I want others to see that I am really trying to deal with my problems'. In our solution this item

was incorporated into the introjected motivation subscale, while for the original English version it loaded highest onto the external motivation subscale [126].

The analysis for the SMFL revealed that this questionnaire had a similar factor structure as the TEQ. The SMFL item ending on 'I find it interesting' did not fit adequately within the internal/external approach/avoidance matrix, which was consistent with SDT since this form of motivation represents a truly internal motive that does not seem to apply to psychiatric treatment engagement [65,86]. That is, generally patients do not feel that engaging in psychiatric treatment is 'interesting' or 'pleasurable' in itself, but rather see this as instrumental to the goal of achieving relief from symptoms and/or resolving problems that result from the psychiatric illness and disabilities.

Reliability

The reliabilities of the Dutch TEQ subscales were generally found to be acceptable, although there is still room for improvement as they ranged between 0.66 (external motivation scale for patients with mood and anxiety disorders) and 0.86 (identified motivation scale for patients with mood and anxiety disorders). Possibly, this could be due to heterogeneity of diagnoses and other patient characteristics within these subsamples. Also, it is likely that a selection bias occurred in the study sample as participation in this study was voluntary and it is plausible to assume that the less motivated or more extrinsically motivated patients were less likely to participate. The found reliabilities are not sufficient for the scale to be used for assessment at the individual level but may currently be used to interpret the sum scores at the level of groups. The test-retest reliabilities after one year were generally adequate. The SMFL subscales showed adequate congeneric estimates of reliability, although the external motivation scale for patients with mood and anxiety disorders was too low. The test-retest correlations were generally good. Future studies using larger samples of more homogenous patient groups are needed to determine if the reliabilities of the TEQ and SMFL can be improved upon for use of assessments at the individual level.

The HCCQ revealed excellent internal consistency for all subsamples and the total sample, and acceptable test-retest reliability. It should be noted however that the HCCQ showed a ceiling effect, such that there was a restriction of range to high scores as most patients were very satisfied regarding their relationship with their clinician. This was a limitation to the correlational analyses.

Validity

The construct validities of the questionnaires were generally supported by correlations between the different scales and methods, although this was less so for the SMFL. The associations between the three TEQ scales and the HCCQ were consistent with theoretical expectations, as the different types of motivation were differentially related to perceived autonomy support in the manner that SDT predicted. Also, the association between the HCCQ and TEQ identified motivation was relatively stronger than the associations with the IM-MET-scale and the TTM-RTC score. Correlations between the TEQ scales and the IM-MET scale and TTM-RTC score suggest that the more broad external-internal distinction of SDT is linked with the quantitative motivation concepts of the TTM and with the IM (although less so) in the manner hypothesized by Jochems et al. [86]; namely that higher levels of identified motivation are associated with higher levels of IM-MET and TTM-RTC while higher levels of external motivation are associated with lower levels of IM-MET and TTM-RTC.

Theoretically, it was expected that when clinicians scored their patients as high on the SES, thereby implicating that patients are available for appointments, seek help when needed and actively engage in treatment (including taking prescribed medications), this would be positively associated with identified motivation and negatively with external motivation. This hypothesis was only partially supported, since it was found that the patient-rated identified motivation scale was significantly associated with clinician-rated treatment engagement, but neither patient-rated introjected nor external motivation was. It did not matter if we treated the SES-scores as a continuous variable (in correlational analyses) or as a dichotomous variable (in t-tests and logistic regression analyses) or if we looked at subscales of the SES (results not presented). Looking at clinician-rated TEQ, the associations with SES were stronger and more consistent with theory, which was probably due to their common method. The TEQ subscales of identified and external motivation were associated with legally mandated treatment in the theoretically expected manner, regardless of who rated the TEQ.

Little support was found for the validity of the patient-rated SMFL scales when looking at the associations with criterion measures. Most support was found for SMFL identified motivation, which showed positive association with TTM-RTC, the HCCQ and with HAQ cooperation and helpfulness as rated by the patient, but not with clinician-rated HAQ subscales or the SES. The implications of the findings

on the SMFL are less clear and deserve further study as we face multiple possible explanations for these findings. A plausible explanation is that the correlations were low due to the fact that the SMFL was not administered at the same time as the TEQ and HCCQ. Other explanations are that perhaps the SMFL is an inadequate measure, the criterion measures might have been inadequate, the design of this study could be inappropriate, or a combination of the above. At the moment, it seems that the SMFL might be useful as a short and simple way to communicate with patients about different types of motivation for treatment, as it slightly resembles the TEQ, but it is far from assessment applications at the individual level.

The HCCQ showed moderate to strong association with the HAQ, depending on the rater (patient or clinician) and the subscale (cooperation or helpfulness). As expected, the strongest correlation was found between the HCCQ and the cooperation subscale of the HAQ when rated by the patient (r_s = 0.71, p<0.01). This is an exceptionally high correlation when considering that Hemphill [206] found that correlations of 0.50 or higher correspond to the 89th percentile of most psychological assessment studies. Also, a similar correlation pattern with the TEQ was found for the HCCQ and HAQ cooperation scale when all were rated by the patient. Both the HCCQ and the HAQ were moderately strongly related to clinician-rated treatment engagement. It seems that the scales (and underlying concepts) are not completely interchangeable but they seem to be perceived highly similar, implying a need for a better differentiation of the concept of 'clinician autonomy support' from other (perhaps more broadly defined) positive clinician behaviors.

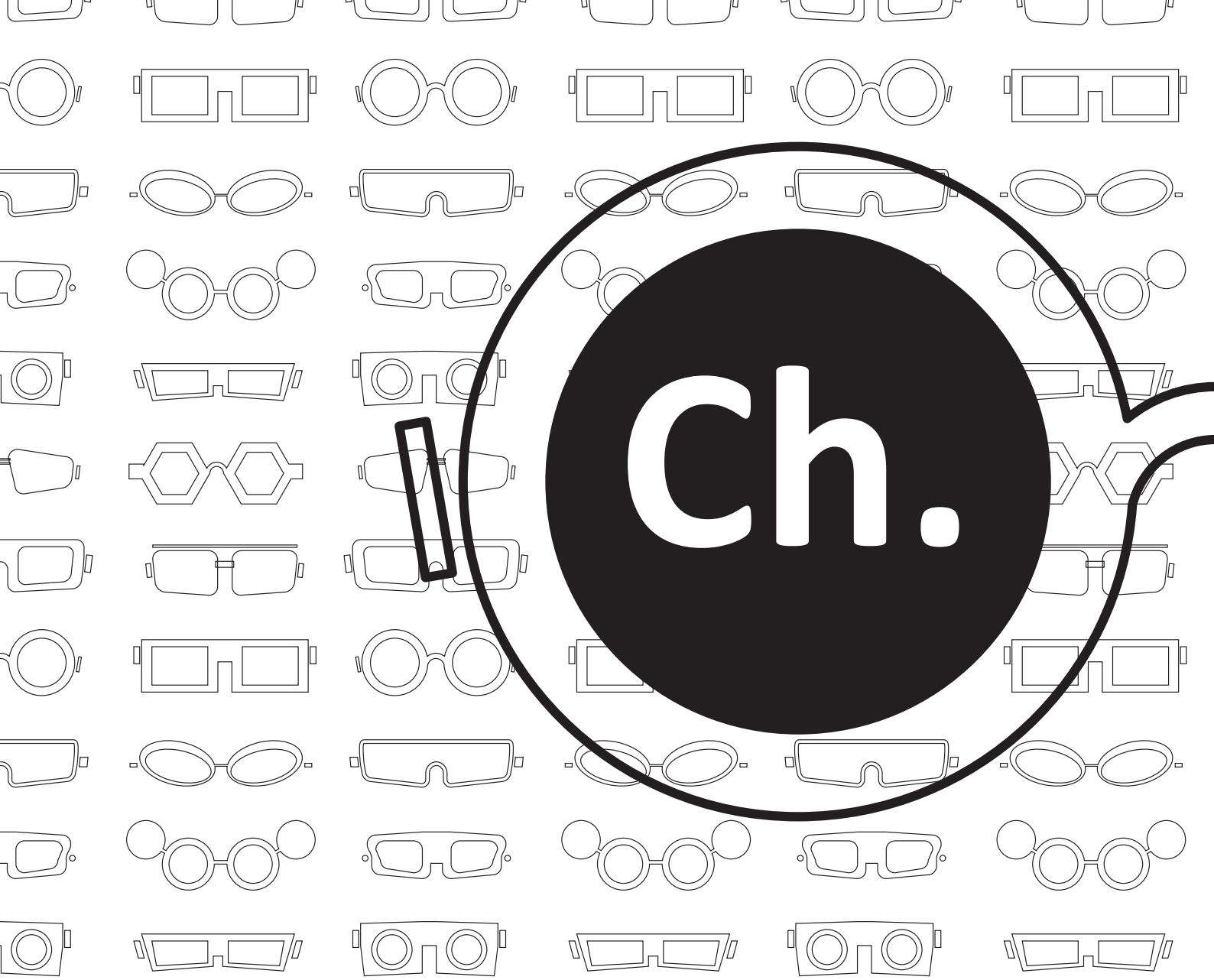
Strengths, limitations and implications

Both a strength and a limitation of this study is the heterogeneity of our study sample that included outpatients with varying primary psychiatric diagnoses and comorbid psychiatric disabilities. Within the three diagnostic groups that we have specified, it is likely that heterogeneity exists between patients with different disorders, such as differences between types of personality disorders, psychotic disorders or mood disorders. These differences might influence the motivational profiles on the questionnaires. This heterogeneity was ignored to obtain adequate sample sizes for each subgroup, but future studies are needed to replicate the findings. On the other hand, the heterogeneity strengthens the generalizability of the findings to a broad psychiatric outpatient population.

Currently, we feel that the SMFL should not be used for assessment purposes, but might be used for structured communication purposes, such as discussing the patient's current motivation for engaging in psychiatric treatment. This is relevant considering that our findings seem to suggest that patients and clinicians have different views on the patient's motivation, which was in line with another study that we recently performed[207]. In an exploratory analysis on the patient-rated SMFL, where we looked at the proximities of the items, we saw that the items formed an ellipse shape rather than clearly distinct clusters of items (results not reported). We felt that the interpretation of this solution could be understood by consideration of both Self Determination Theory and approach-avoidance theories of motivation [208]. One axis within the SMFL represents the internal-external continuum proposed by SDT and appeared to be the most important one, while the other axis represents approach-avoidance motives which operates orthogonally to the internal-external axis. Several items can be interpreted as representing approach ('I will feel proud of myself if I do so') or avoidance motives ('I may not disappoint myself' and 'I may not disappoint others'). Using the SMFL as a starting point for a discussion between the patient and clinician regarding the patient's current motivation for treatment, these external/internal and approach/avoidance motives can be explored. It should be noted that theoretically, patients can endorse all these motives simultaneously as they are not mutually exclusive. A high score for one type of motivation does not preclude a high score for another type. As an example, Silverstein (2010) mentions supported employment for patients with schizophrenia, where the intrinsically motivating psychological benefits of work (e.g. sense of competence and having a valued social role, sense of autonomy) are combined with the benefits of earning money [196].

Investigating the construct validity of the scales is an ongoing iterative evaluation process [209] that should be continued after this study, preferably with other criterion measures and in other (larger and more homogenous) patient populations. The predictive utility of the scales should be investigated with longitudinal data, with other measures of treatment engagement and other outcomes such as drop-out, psychosocial functioning and the patient's quality of life. These criterion measures should include more objective measures of treatment engagement, such as percentage of no-shows in clinical practice and/or blood levels of (antipsychotic) medication use. Nevertheless, the preliminary results of this study

are promising and suggest that the TEQ, SMFL and HCCQ could be valuable instruments for research on SDT in psychiatric outpatients or for clinical purposes such as discussing the patient's motivation to engage in treatment.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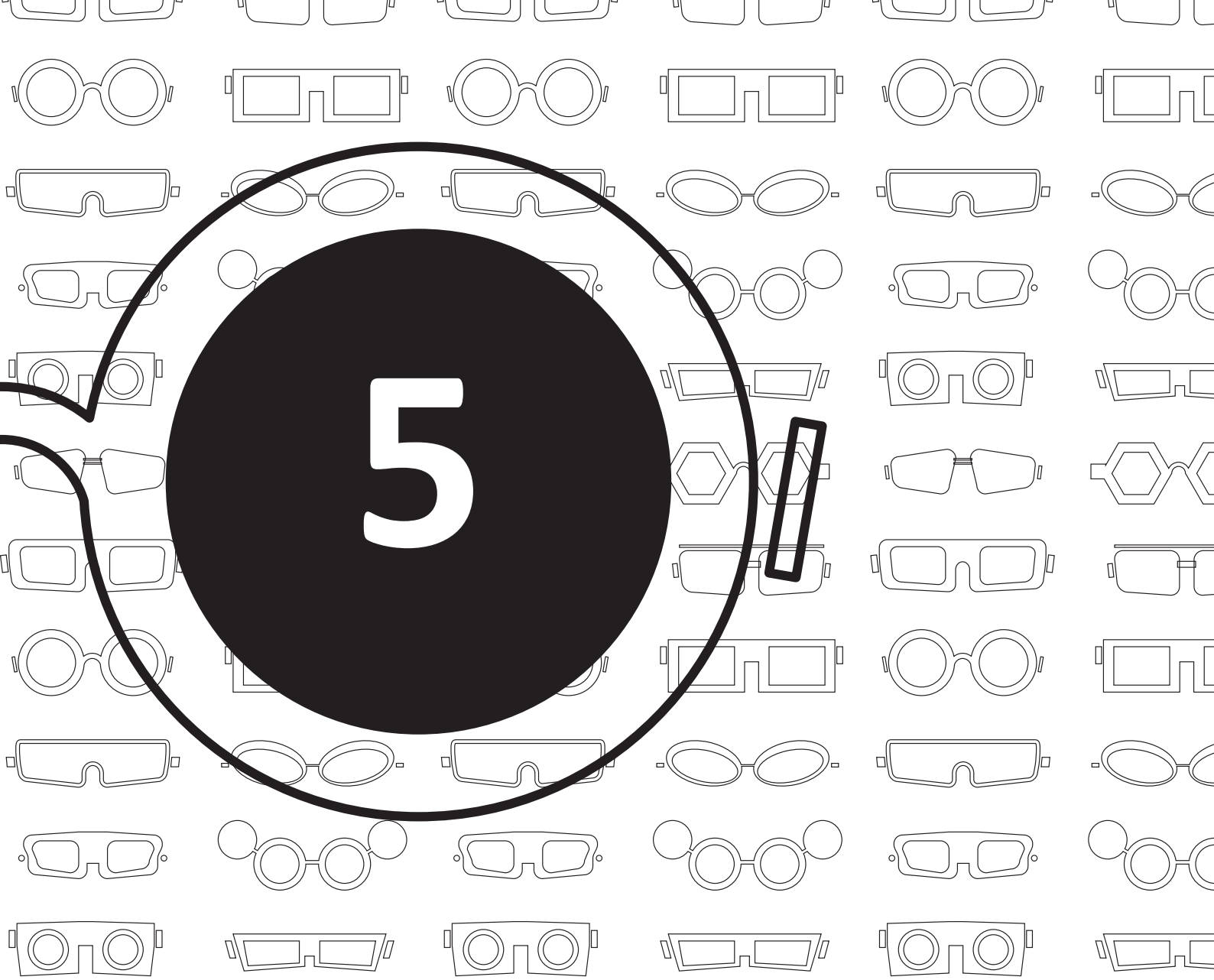
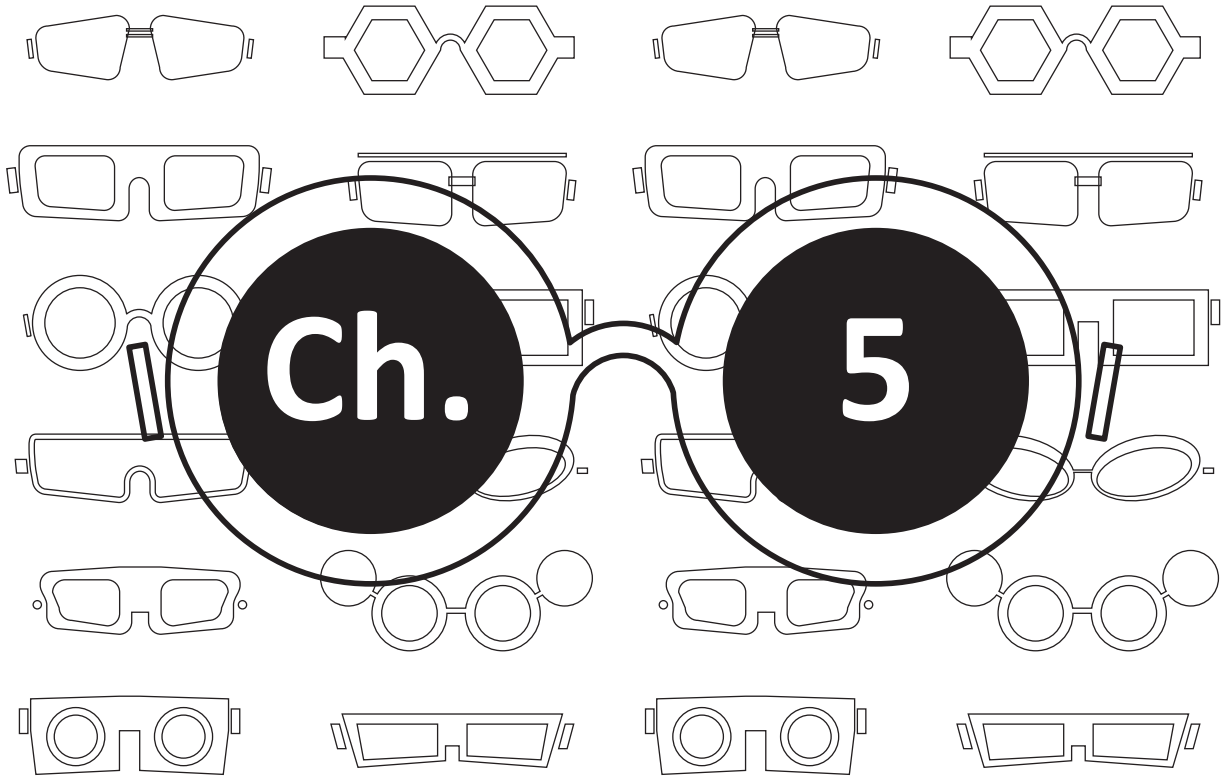


5

Motivation, treatment engagement and psychosocial outcomes in outpatients with severe mental illness:

A test of Self-Determination Theory

Jochems, E.C., Duivenvoorden, H.J., van Dam, A., van der Feltz-Cornelis, C.M., Mulder, C.L. 2016. Motivation, treatment engagement and psychosocial outcomes in outpatients with severe mental illness: A test of Self-Determination Theory. International Journal of Methods in Psychiatric Research, revised and resubmitted.



Objective

Currently, it is unclear whether Self-Determination Theory (SDT) applies to the mental health care of patients with severe mental illness (SMI). Therefore, the current study tested the process model of SDT in a sample of outpatients with SMI.

Methods

Participants were 294 adult outpatients with a primary diagnosis of a psychotic disorder or a personality disorder and their clinicians (n=57). Structural equation modelling was used to test the hypothesized relationships between autonomy support, perceived competence, types of motivation, treatment engagement, psychosocial functioning and quality of life at two time points and across the two diagnostic groups.

Results

The expected relations among the SDT variables were found, but additional direct paths between perceived competence and clinical outcomes were needed to obtain good model fit. The obtained process model was found to be stable across time and different diagnostic patient groups, and was able to explain 18% to 36% of variance in treatment engagement, psychosocial functioning and quality of life.

Conclusion

It is concluded that SDT can be a useful basis for interventions in the mental health care for outpatients with SMI. Additional experimental research is needed to confirm the causality of the relations between the SDT constructs and their ability to influence treatment outcomes.

Introduction

Background and rationale

Self-Determination Theory (SDT) [48] claims to provide a universal framework for understanding the individual and environmental factors that produce and shape certain types of motivation and subsequent engagement with behaviour [48]. SDT describes different types of motives or *reasons why* a person may engage in behaviour, that fall along a continuum of self-determination in the following order from most to least self-determined: intrinsic, integrated, identified, introjected, external and amotivation [65,123]. For example, identified motivation is evident when a patient recognizes and accepts that treatment is useful for achieving personally relevant goals [65], which is more internalized than introjected motivation, which is evident when a patient is driven by feelings of guilt, shame or anxiety, and might feel ashamed or disappointed if he did not remain in treatment. To date, several studies have found support for the utility of SDT's motivational constructs in relation to cognitive and psychosocial functioning in patients with schizophrenia spectrum disorders [66-69]. For example, studies show that intrinsic motivation in schizophrenia spectrum disorders can change over time [66,68,70], predicts improvements in learning and psychosocial functioning [66,71,72], is positively associated with physical activity [210] and mediates the relationship between negative and disorganized symptoms of schizophrenia and psychosocial functioning [69].

It has been suggested that SDT may be useful as a basis for psychosocial interventions for patients with severe mental illness (SMI) [73,74]. In line with this, we have recently conducted and reported on a cluster-randomized controlled trial in which a motivation feedback intervention based on SDT was investigated in outpatients with SMI [211]. In this study, clinicians were trained in the principles of SDT and the use of a short questionnaire as a communication tool with patients about their motivation for treatment (i.e. providing them with motivation feedback). It was expected that the motivation feedback would help to internalize the patient's motivation resulting in a higher level of treatment engagement, compared to treatment as usual. After one year of treatment, however, no statistically significant differences between the intervention group and control group on treatment engagement, psychosocial functioning and quality of life were found [211]. Although the results of the trial were negative, this was not taken as decisive evidence against SDT, as the motivation feedback may not have been able to successfully affect SDT-constructs such as patient autonomy and competence. We argued that the motivational constructs of SDT might still be able to predict clinical outcomes in both treatment conditions. The aim of the current study therefore, is to investigate the basic process model of SDT in the patient sample of the trial. In the following, we will briefly describe SDT, it's hypotheses and the specific objectives regarding the testing of this theory in outpatients with SMI.

Self-Determination Theory

Central to SDT is the notion of the basic human needs for autonomy, competence and relatedness that, when supported, facilitate the internalization of motivation [48]. Internalization is the process through which reasons for change and motivations for particular behaviours are integrated to different degrees into the sense of self [48]. The environmental context, which may include the mental health care system, can support autonomy by acknowledging the patient's perspective, offering choice (about treatment options) and support initiative while minimizing pressure and control [65]. Further, when patients are additionally afforded the skills and tools for change and are helped to experience mastery and control over their behaviour, they may gain a sense of competence [123]. Relatedness may be supported by involvement with others in an empathic, affectionate and dedicated manner [212]. It is argued that regardless of the motivational starting point, the support for the basic needs is essential for internalization of motivation, which in turn would lead to the instigation and sustainment of treatment-related behaviours such as engagement, but also to better health and higher quality of life [65].

According to SDT, the more internal the perceived cause of a person's behaviour [82], the more likely the person is to persist in this behavioural activity, and in case of treatment, to adhere to a therapeutic regimen. Conversely, the more external perceived cause of behaviour, or the more a person's reasons for entering treatment are based on external regulators, the less persistence and adherence are expected [48]. In line with this, it is generally found that initial increases in target behaviours in response to token economy systems, which involve rewarding patients for specified target behaviours, are not sustained after reinforcements are withdrawn [213]. Alternatively, other authors have suggested that external motivation may be beneficial and even necessary to optimally enhance motivation and outcomes in patients with motivational deficits [196,214]. For example, when individuals present with low baseline levels of intrinsic motivation for engaging in treatment, extrinsic rewards such as praise by a mental health worker or receiving help for financial problems, may help to achieve short-term desired goals and provide

a sense of self-competency and relatedness which may in time stimulate internalization of motivation [196,214]. In a study by Ryan et al. [35] among patients in alcohol treatment, outcomes were most beneficial for those with both high intrinsic and high extrinsic motivation, which suggests a potential synergistic effect of different motivational types. In a study by Wild et al. [126] involving patients seeking treatment for addiction problems, introjected treatment motivation was positively related to both perceived benefits of reducing alcohol or drug use and to perceived costs of reducing alcohol or drug use. Currently, it is still unclear how different types of motivation affect the psychosocial treatment of individuals with SMI, including the way through which the different types of motivation affect treatment engagement and treatment outcomes.

The current study aims to determine whether the basic process model of SDT is applicable in a setting of outpatients with SMI. The basic process model that will be tested in the current study, is based on previous studies of SDT in health care contexts [215-217] and on our own previous work on the relationships between autonomy support and motivation types in the current patient sample [218]. In the meta-analyses by Ng et al. [217] on studies of SDT in health care contexts, support was found for a model in which autonomy support predicted perceived competence as well as motivational regulations, which were in turn predicted health outcomes. Further, in a previous study in which we examined the factor structure of a SDT questionnaire for motivation types [218], we found support for a model with three intercorrelated factors which were interpreted as identified, introjected and external motivation. This structure was incorporated into the larger structural model which will be tested in the current study, as shown in Figure 1.

Hypotheses

1: It was hypothesized that the process model as outlined in Figure 1 would be plausible. If this model does not turn out to be plausible, we will evaluate which alternative model is more plausible.
2: It was hypothesized that the model would be stable across time (i.e. baseline and one year later) and across patient groups (i.e. patients with primarily a personality disorder versus those with primarily a psychotic disorder).
3: It was hypothesized that the model would show clinical utility by explaining observed variance in clinical outcomes, including clinician-rated treatment engagement, interviewer-rated psychosocial functioning and patient-reported quality of life.

Methods

Study Design

The current longitudinal study constitutes a secondary analysis of a cluster randomized clinical trial [197]. The study was approved by an official medical ethical committee as well as by the scientific committees of the two specialty mental health institutions where the data were collected.

Setting

Data were collected between May 2011 and October 2013 from 12 outpatient treatment programs, including a forensic psychiatric outpatient clinic, three specialized psychotic outpatient treatment programs and eight several flexible assertive community treatment teams (FACT-teams [14]) of two specialty Dutch mental health treatment centres. FACT-teams provide assertive, outreaching, community-based, and supportive psychiatric services to individuals with SMI [14], such as those with psychotic disorders and severe personality disorders.

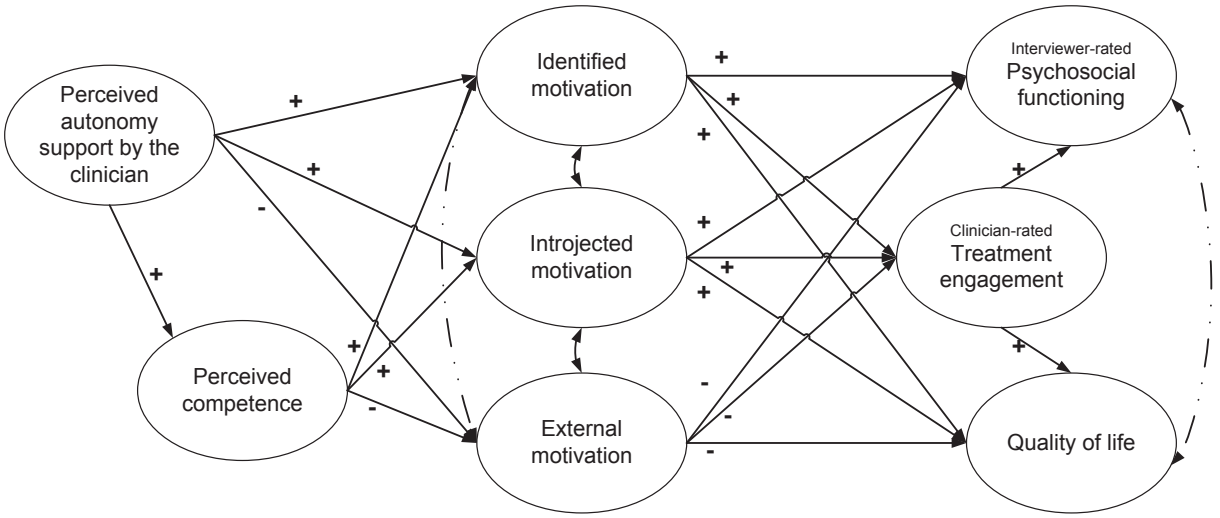
Participants and procedures

Inclusion criteria for patients were: a primary diagnosis of psychotic or personality disorder, aged 18 to 65 years, undergoing individual outpatient treatment and having a sufficient command of the Dutch language. A clinician was eligible for participation if he or she was the primary health care provider involved with the patient and saw the patient most frequently. Eligible patients on the clinicians' caseload lists were approached and informed by researchers and asked for their signed consent. Both patients and clinicians were asked to fill in questionnaires at baseline and follow-up assessment (12 months after baseline) and additionally, patients were interviewed regarding their functioning in several life domains by independent research assistants at these assessment moments. To enhance the likelihood of participation, patients were given an incentive of 15 euro for the baseline and follow-up assessment in the trial.

Measures

All measures for the current study were assessed at baseline and at follow-up (12 months after baseline) in the trial in which the current data were collected [197,211]. Baseline assessment took place after randomization at clinician-level, such that patients but not clinicians were blind to treatment allocation at baseline assessment.

Figure 1. Hypothesized conceptual model based on Self-Determination Theory



Note: Thick lines represent theoretically expected regression paths, dotted lines represent theoretically expected intercorrelations of variables. A plus indicates a hypothesized positive relationship between the constructs, a minus indicates a negative hypothesized relationship. Variables reflect patient-rated constructs unless indicated otherwise.

Clinical outcomes: Treatment engagement, psychosocial functioning and quality of life

Treatment engagement was measured with the Service Engagement Scale (SES) that was filled out by clinicians. The SES was developed to measure engagement with community mental health services [199]. It comprises 14 items that assess availability, collaboration, help seeking and treatment engagement behaviours (including medication adherence). The items are rated on a 4-point scale ranging from 0 (not at all) to 3 (most of the time). The SES has good internal consistency (Cronbach's α =0.87, congeneric estimate of reliability = 0.91 in the current sample) and validity [199,218]. The SES total scale score was used as the outcome measure in this study, where higher scores denote higher treatment engagement.

The patient's psychosocial functioning was measured with the Dutch version of the Health of the Nations Outcome Scales (HoNOS)[163,164]. The HoNOS is a semi-structured interview with the patient in which health and social problems of the previous two weeks are quantified. It contains 12 items that refer to behavioural problems, cognitive and physical impairments, symptoms, and social functioning. HoNOS items are scored on a scale from 0 (no problem) to 4 (severe problem). The total scale score is computed by adding the 12 items. For ease of interpretation, we recoded the total score such that higher scores reflected better psychosocial functioning. The administration of the HoNOS was performed by independent research assistants (mostly graduate students in psychology and medicine) who had no involvement in the patient's treatment. The psychometric properties of the total scale score were shown to be acceptable [164]. Internal consistency was acceptable in the current study (Cronbach's α = 0.70, congeneric estimate of reliability = 0.77).

The patient's quality of life was assessed with the Manchester Short Assessment of Quality of Life (MANSA)[167,168]. The MANSA is a self-report questionnaire that asks the patient how satisfied he/she is in the following life domains: living situation, social relationships, physical health, mental health, safety, financial situation, work situation and life as a whole. The 12 items are scored on a Likert scale from 1 (couldn't be worse) to 7 (couldn't be better), which are summed to calculate a total score. Higher scores denote a higher perceived quality of life. The scale is shown to be reliable (i.e. Cronbach's α = 0.82 and congeneric estimate of reliability = 0.92 in the current sample) and other psychometric properties are considered satisfactory [167].

Core theoretical constructs of SDT: types of motivation and need support

Motivation for engaging in treatment as postulated by SDT was measured with the Treatment Entry Questionnaire (TEQ)[126,218] that was administered to patients. The TEQ contains three subscales (external, introjected and identified motivation), each with 6 items rated on a scale from 1 (strongly disagree) to 7 (strongly agree). The congeneric estimates of

reliability for TEQ subscales ranged from 0.72 to 0.78, which was considered adequate[218]. In a previous study, we found support for the construct validity of the TEQ [218]. Higher scale scores denote higher levels of that type of motivation.

The Health Care Climate Questionnaire (HCCQ) [134] was administered to patients to assess the degree to which patients perceived their clinician as autonomy supportive. The HCCQ has 15 items that are scored on a Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The items are summed up to a total scale score, with higher scores reflecting higher perceived autonomy support. Internal consistency was found to be good (Cronbach's α = 0.93, congeneric estimate of reliability = 0.93)[218] and the scale was shown to be valid for patients with SMI [218].

The subscale 'Outcome Expectancy' from the Treatment Motivation Scales for Forensic patients (TMS-F) was administered to patients as a measure for the patient's perceived competence in being able to finish the treatment and making and sustaining the behaviour changes learned during treatment. Example items include 'I am absolutely certain that I will be able to maintain my new behaviour after the treatment', 'I probably do not have enough patience for this treatment' and 'I think that my problem behaviour will never really change'. The scale consists of 9 items rated on a 5-point Likert scale from 0 (totally agree) to 5 (totally disagree). Several items are reverse scored after which the items are summed, such that a higher score on the subscale reflects a higher perceived competence. Internal consistency was good in the current sample (Cronbach's α = 0.82, congeneric estimate of reliability = 0.86) and previous studies in forensic psychiatry have provided support for convergent and discriminant validity of the scales of the TMS-f [116,118].

Statistical analyses

The analyses were performed in several steps. First, the bivariate relations of variables were estimated using Spearman correlations. Structural equation modelling (SEM) as implemented in Mplus version 7.3 [32] was used to test the hypothesized relationships between autonomy support, perceived competence, types of motivation, treatment engagement, psychosocial functioning and quality of life as depicted in Figure 1.

Latent variables

Both at baseline and at follow-up we evaluated the plausibility of the SDT process model using latent path analysis as outlined in Figure 1. Classical reliability theory reformulated in terms of confirmatory factor analysis enabled to identify latent variables. Congeneric reliability estimates [203,219] were obtained as both the common factors loadings and the residuals turned out to differ. Subsequently, a factor analysis model for each observed variable was defined , in which the factor loading was fixed at 1.0 and the residual variance of that factor (i.e. 1- reliability) was multiplied by the variance of the variable at issue. In doing so, the observed variables were corrected for unreliability resulting in the latent variables.

Model testing

As the type of design was complex (patients clustered within teams) and, in addition, the distributions of the variables were considered to be non-normal, the estimation method used was MLR. This maximum likelihood estimates standard errors and χ^2 test statistic that are robust to non-normality and non-independence of observations. The MLR standard errors were estimated using a sandwich estimator. Multilevel analyses were performed to adjust for potential clustering of the data within teams (i.e. the variable 'team' was included as an additional level in the analyses).

First, the model as depicted in Figure 1 was fitted to the data for the full sample using the baseline and follow-up measurements separately. The following measures were used to test for adequacy of the model fit: χ^2 for model fit (low and non-significant values of the χ^2 were desired; P-value > 0.05); χ^2/df ratio (a value <2.0 was considered to be acceptable); information criteria including Akaike (AIC), Bayesian (BIC), sample-size adjusted BIC (SS-BIC) (the smaller the better); Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) (high values are desired (> 0.95), values > 1.0 point to over identification [220,221]); Root Mean Square Error of Approximation (RMSEA: a value < 0.05 indicates a close fit [222]; and Standardized Root Mean Squares of Residuals (SRMR: a value of < 0.05 indicates a reliable fit)[201]. Explained variances (R^2) were used to describe the performances of the determinants for the individual dependent variables. It was tested whether the baseline model showed a good overall fit. If not, it was evaluated how it could be adapted such that the fit would improve or alternatively, whether the model could be simplified while not threatening the overall model fit. The most plausible model was obtained by evaluating the model fit criteria and standardized residuals. Further, the MLR χ^2 difference test [223] was used to compare different models which were nested.

The invariance of the most plausible path model across time was evaluated by testing the invariance of the regression estimates of the latent variables, by comparing those assessed at baseline with those

Table 1. Baseline characteristics of participating patients, stratified by primary diagnosis

	Total patient sample n = 294	Psychotic disorders n= 199	Personality disorders n = 95
Age, mean (SD)	44 (10.3)	43 (10.3)	45 (10.0)
Male gender, n (%)	179 (60.9)	132 (66.3)	47 (49.5)
Dutch ethnicity, n (%)	208 (70.7)	140 (70.4)	68 (71.6)
Education level, n (%)			
- No education/elementary	108 (36.7)	76 (38.2)	32 (33.7)
- Secondary school	124 (42.2)	75 (37.7)	49 (51.6)
- Upper high school and over	59 (20.1)	47 (23.6)	12 (12.6)
Comorbid substance use problemsA, n (% yes)	74 (25.2)	42 (21.1)	32 (33.7)
Legal mandate, n (% yes)	24 (6.9)	13 (6.5)	11 (12.0)
One or more previous admissions, n, (% yes)	227 (77.2)	159 (79.9)	68 (71.6)
Perceived competence, median (IQR)	31 (28 to 39)	34 (29 to 39)	32 (26 to 38)
Perceived autonomy support, median (IQR)	91 (78 to 100)	90 (75 to 100)	92 (81 to 100)
Identified motivation, median (IQR)	36 (30 to 40)	36 (29 to 39)	36 (30 to 40)
Introjected motivation, median (IQR)	23 (16 to 30)	23 (16 to 30)	23 (17 to 30)
External motivation, median (IQR)	16 (11 to 24)	18 912 to 25)	13 (7 to 21)
Treatment engagement, median (IQR)	31 (24 to 36)	32 (25 to 37)	28 (24 to 35)
Psychosocial functioning, median (IQR)	9 (6 to 13)	8 (5 to 12)	10 (8 to 15)
Quality of life, median (IQR)	5 (4 to 5)	5 (4 to 5)	4 (4 to 5)

[A] Substance abuse problem was defined as having a DSM-IV diagnosis of substance abuse and/or dependence in the medical record.

assessed at follow-up using the MLR χ^2 difference test. Fitting both latent path models (baseline and follow-up) jointly was used to evaluate whether the regression estimates of both time points could be considered invariant. Specifically, a non-significant MLR χ^2 difference test between the model with all regression estimates constrained to be equal for the corresponding measurements versus all regression estimates unconstrained was considered statistical evidence for the latent path model being invariant across time. Individual estimates were regarded statistically significant if the two-sided P-values were < 0.05. The correlations of the latent variables between the corresponding measurements were allowed to be free as the measurements were repeated. It should be noted that it was decided not to analyse the data longitudinally (e.g. correlated change analysis or cross-lagged analyses) because the motivational intervention was conducted in between the two assessment moments and may have affected the 'natural' change between the two time points.

A similar procedure was applied to test whether the model was invariant across different patient groups (personality disorders versus psychotic disorders). To test to what extent the process model has utility for clinical practice, it was evaluated how much variance was explained on the dependent variables in the model, namely treatment engagement, psychosocial functioning and quality of life.

Results

Participants and descriptive data

The enrolment of participants took place from May 2011 to September 2012, at which time a total of 57 clinicians and 294 eligible patients were enrolled in the study. Table 1 shows an overview of the patient characteristics. Within the subsample of patients with psychotic disorders, the majority of patients were diagnosed with schizophrenia (48%), schizoaffective disorder (16%), or psychotic disorder not otherwise specified (24%). Within the subsample of personality disorders, 40% had a borderline personality disorder, 13% had antisocial personality disorder, and 26% had a personality disorder not otherwise specified. Most clinicians were female (63%), their mean age was 44 years (SD = 10.70) and they had a mean of 16 years of clinical working experience in mental health services (SD =9.30). At 12 months, 253 patients (86%) were re-assessed. The group that was lost to follow-up was significantly more often of non-Dutch ethnicity (48% versus 26%, p<0.01) and more often had a legal mandate for treatment (18% versus 7%, p = 0.03) compared to completers.

The correlations between SDT constructs and clinical outcomes are shown in Table 2. Most of the correlations between baseline psychological needs (autonomy and competence) and other variables at baseline and follow-up were medium to high, in the expected direction and reached statistical significance at $p<0.05$ (two-tailed).

Path analyses

Test of the SDT process model

First, all observed variables were linearly transformed by a factor of 10 to reduce their variances which allowed Mplus to reach convergence[202]. Subsequently, the observed variables were corrected for unreliability resulting in the latent variables. The latent variables were used in the subsequent path analysis, where the process model as depicted in Figure 1 was fitted to the data at baseline (Model 1a) and at follow-up (Model 2a). As can be seen in Table 3, Model 1a provided bad fit to the data (χ^2 / df = 7.64, RMSEA = 0.15, CFI = 0.92, TLI = 0.61, SRMR = 0.03) as did Model 2a (χ^2 / df = 14.44, RMSEA = 0.22, CFI = 0.81, TLI = 0.09, SRMR = 0.04). The modification indices and standardized residuals suggested that the misfit was most likely due to lacking direct effects between perceived competence and clinical outcomes (treatment engagement, psychosocial functioning and quality of life). Such direct effects were also theoretically plausible [217]. When these three paths were added, model fit for both measurement occasions improved substantially as can be seen in Table 3. Other rivalling models, including those with the regression path between autonomy support and perceived competence in the opposite direction, additional direct regression paths from autonomy support to clinical outcomes and a model in which autonomy support and perceived competence were simply inter-correlated either provided worse fit to the data or did not improve the fit. Therefore, it was decided to retain models 1b and 2b for further analyses, which included testing the obtained SDT process model for invariance across time.

Test of the SDT process model across time

Testing the process model across time was done by testing the invariance of the regression estimates of the latent variables across the two measurement occasions. A model was created in which both baseline and follow-up latent path models were included simultaneously (Model 3). In the first version of this model the regression weights were allowed to be free (unconstrained) for the baseline and follow-up measurements (Model 3a), which resulted in borderline fit to the data (χ^2/df=2.39, RMSEA=0.07, CFI=0.94, TLI=0.89, SRMR=0.08). Subsequently, a second version of this model was created (Model 3b) in which the regression weights for the corresponding paths at baseline and follow-up were constrained to be similar. Model 3b provided good fit to the data (χ^2/df =2.19, RMSEA=0.06, CFI=0.93, TLI=0.90, SRMR=0.08).

The test for invariance across time was represented by the MLR χ^2 difference test between the model with all regression estimates constrained to be equal for the corresponding measurements (Model 3b) versus all regression estimates unconstrained (Model 3a), where a non-significant χ^2-test was considered statistical evidence for the latent path model being invariant across time. The χ^2-test did not reach statistical significance ($\Delta\chi^2$=30.67, Δdf=21,p=0.08), which provided support for the hypothesis that the SDT process model was invariant across time. Model 3b was accepted as a plausible model for the representation of SDT and was used in the subsequent analyses. This model is shown in Figure 2, including standardized regression coefficients for the baseline and follow-up measurements. It can be seen in Table 4 that around 26% of the variance of psychosocial functioning and between 31% and 36% of the variance of quality of life was explained depending on the time of measurement.

Table 2. Spearman intercorrelations of variables in the model

	Baseline assessment								Follow-up assessment							
	CO	AS	ID	IN	EX	TE	PF	QL	CO	AS	ID	IN	EX	TE	PF	QL
Baseline assessment																
Perceived competence (CO)																
Autonomy support (AS)	**0.45**															
Identified motivation (ID)	**0.27**	**0.53**														
Introjected motivation (IN)	-0.02	**0.22**	**0.43**													
External motivation (EX)	**-0.16**	**-0.15**	**-0.28**	**0.13**												
Treatment engagement (TE)	**0.30**	**0.26**	**0.26**	0.06	-0.04											
Psychosocial functioning (PF)	**0.33**	**0.19**	0.08	-0.06	0.07	**0.38**										
Quality of life (QL)	**0.45**	**0.29**	0.11	-0.03	0.10	**0.37**	**0.57**									
Follow-up assessment																
Perceived competence (CO)	**0.61**	**0.35**	**0.14**	-0.03	-0.10	**0.23**	**0.23**	**0.41**								
Autonomy support (AS)	**0.41**	**0.60**	**0.28**	0.09	-0.12	**0.32**	**0.16**	**0.34**	**0.58**							
Identified motivation (ID)	**0.28**	**0.38**	**0.54**	0.34	-0.11	**0.27**	**0.14**	**0.13**	**0.22**	**0.38**						
Introjected motivation (IN)	0.04	0.07	**0.27**	**0.62**	**0.18**	**0.14**	0.03	0.01	-0.05	0.01	**0.40**					
External motivation (EX)	**-0.17**	**-0.19**	**-0.17**	**0.14**	**0.52**	-0.03	-0.03	-0.03	-0.21	-0.25	**-0.15**	**0.33**				
Treatment engagement (TE)	**0.26**	**0.27**	**0.26**	0.10	-0.02	**0.65**	**0.24**	**0.28**	**0.34**	**0.38**	**0.29**	0.09	**-0.18**			
Psychosocial functioning (PF)	**0.30**	**0.15**	0.08	-0.03	-0.04	**0.28**	**0.44**	**0.36**	**0.37**	**0.21**	-0.02	-0.06	-0.05	**0.25**		
Quality of life (QL)	**0.39**	**0.26**	0.04	-0.04	0.00	**0.21**	**0.28**	**0.58**	**0.49**	**0.32**	-0.02	**-0.13**	-0.11	**0.21**	**0.61**	

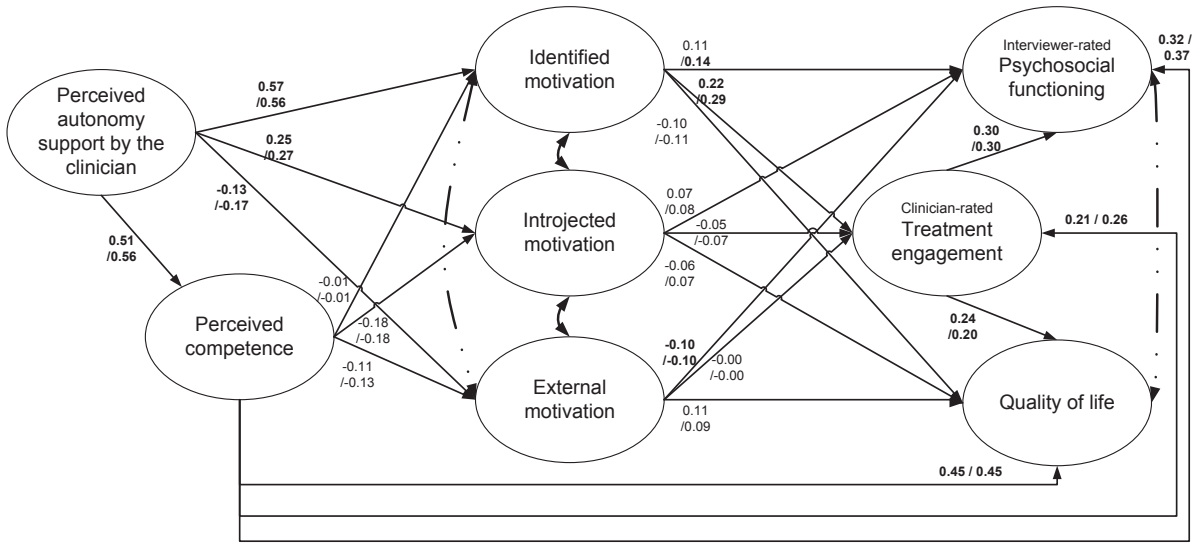
Boldface indicates $p < 0.05$ (two-tailed).

Table 3. Model fit information

Model	C or U	χ2	df	χ2/df	p-value	RMSEA	90% C.I. for RMSEA	CFI	TLI	SRMR	AIC	BIC	SS-BIC
1a. Baseline process model (Figure 1)	-	45.85	6	7.64	<0.01	0.15	0.11 to 0.19	0.92	0.61	0.03	4156	4296	4175
1b. Baseline process model (as 1a plus additional paths between perceived competence and outcomes)	-	1.87	3	0.62	0.60	0.00	0.00 to 0.08	1.00	1.02	0.01	4133	4284	4154
2a. Follow-up process model (Figure 1)	-	86.64	6	14.44	<0.01	0.22	0.18 to 0.26	0.81	0.09	0.04	3272	3410	3290
2b. Follow-up process model (as 2a plus additional paths between perceived competence and outcomes)	-	9.75	3	3.25	0.02	0.09	0.03 to 0.15	0.98	0.85	0.02	3238	3388	3258
3a. Baseline and follow-up jointly (as 1b and 2b)	U	143.55	60	2.39	<0.01	0.07	0.05 to 0.08	0.94	0.89	0.08	6829	7168	6876
3b. Baseline and follow-up jointly (as 1b and 2b)	C	177.59	81	2.19	<0.01	0.06	0.05 to 0.08	0.93	0.90	0.08	6814	7075	6850
4a. Baseline process model (as 1b) for psychotic versus personality disorders	U	75.32	6	12.55	<0.01	0.28	0.23 to 0.34	0.86	-0.35	0.02	4134	4436	4176
4b. Baseline process model (as 1b) for psychotic versus personality disorders	C	33.13	27	1.23	0.19	0.04	0.00 to 0.08	0.99	0.97	0.05	4111	4336	4142
5a Follow-up process model (as 2b) for psychotic versus personality disorders	U	29.38	6	4.90	<0.01	0.17	0.11 to 0.23	0.95	0.50	0.03	3252	3552	3292
5b Follow-up process model (as 2b) for psychotic versus personality disorders	C	55.47	27	2.05	<0.01	0.09	0.05 to 0.12	0.94	0.86	0.10	3242	3465	3271

Note: C or U = Model with either constrained (C) or unconstrained (U) regression coefficients for corresponding measurements at baseline and follow-up. The grey and white shading indicates models that are rivaling (nested) models (similar shading indicates rivaling models). χ^2 = chi-square statistic; df = degrees of freedom; RMSEA = root mean square error of approximation; CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, SRMR = standardized root mean square residual; AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, SS-BIC = Sample size adjusted BIC.

Figure 2. Testing the SDT process model across time on clinical outcomes of treatment engagement, psychosocial functioning and quality of life



Note: The figure represents Model 3b, with all regression coefficients constrained for the corresponding measurements at baseline and follow-up (i.e. indicating that these are invariant across time). Numbers represent standardized regression coefficients for the corresponding path (baseline / follow-up), where boldface indicates that the estimate is statistically significant at p<0.05. Thick lines represent regression paths, dotted lines represent intercorrelations of variables. Variables reflect patient-rated constructs unless indicated otherwise. The intercorrelations between the motivation scales and between the patient's psychosocial functioning and quality of life were as follows: ID with IN = 0.32/0.32, ID with EX =-0.24/-0.03 , IN with EX = 0.04/0.28, PF with QL = 0.42/0.61.

Table 4. Variances explained by the SDT process model

Model	Variance (R2)						
	CO	ID	IN	EXT	TE	PF	QL
1b. Baseline	0.26	0.39	0.10	0.04	**0.18**	**0.26**	**0.36**
2b. Follow-up	**0.38**	**0.22**	0.01	**0.10**	**0.24**	**0.26**	**0.31**

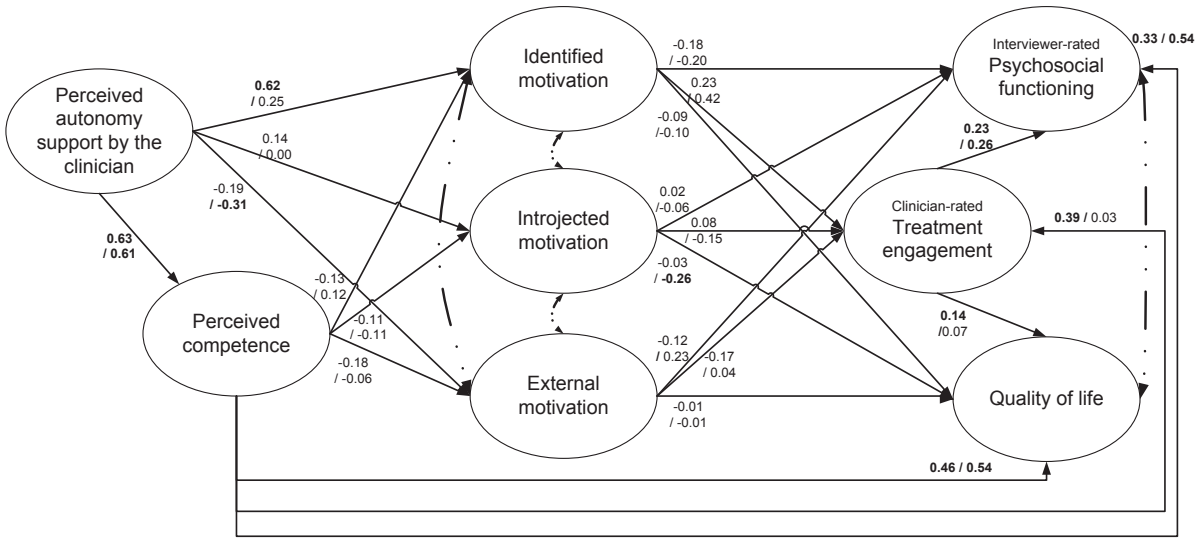
Note: CO = perceived competence; ID = identified motivation; IN = introjected motivation; EX = external motivation; TE = treatment engagement; PF = psychosocial functioning; QL = quality of life. N.a. = not applicable. Boldface indicates p<0.05 (two-tailed).

Test of the SDT process model across patient groups

To further test the robustness of the SDT process model, it was tested whether the model could be considered invariant across different diagnostic groups of patients. The two groups consisted of those with a primary diagnosis of a psychotic disorder and those with a primary diagnosis of a personality disorder. First, it was tested whether the process model at baseline (Model 1b) could be considered invariant across patient groups by evaluating the χ^2-test, which did not reach statistical significance ($\Delta\chi^2$=16.91, Δdf=21,p=0.73) and thus provided support for the hypothesis that the SDT process model was invariant across different patient groups at the baseline measurement.

The same procedure was repeated for the process model at follow-up (model fit is shown in Table 3). Here, it was found that the χ2-test for nested models did reach statistical significance ($\Delta\chi$2=34.85, Δdf=21, p=0.03), which was interpreted as the SDT process model being variant across the patient groups at follow-up. It was explored whether these differences could be explained by loss-to-follow-up (e.g. differences between the sample at baseline and the sample at follow-up) but this was not the case. Therefore, the regression estimates for models 5a and 5b were inspected and several discrepancies were found between the two patient groups at the follow-up assessment, including the associations between autonomy support and all three motivation types. These are shown in Figure 3. For example, patients with psychotic disorders showed a stronger positive association between autonomy support and identified motivation

Figure 3. Testing the SDT process model across diagnostic groups at follow-up



Note: The figure represents Model 5a, with all regression coefficients unconstrained for the corresponding measurements of each diagnostic group at follow-up. Numbers represent standardized regression coefficients for the corresponding path (psychotic disorders / personality disorders), where boldface indicates that the estimate is statistically significant at p<0.05. Thick lines represent regression paths, dotted lines represent intercorrelations of variables. Variables reflect patient-rated constructs unless indicated otherwise.

compared to those with personality disorders (β= 0.62 versus β=0.25, respectively), and a less strong negative association between autonomy support and external motivation (β= -0.19 versus β=-0.31, respectively). Also, regarding the associations between SDT constructs and treatment engagement, it was found that patients with psychotic disorders showed a stronger positive association between perceived competence and treatment engagement (β= 0.39 versus β=0.03, respectively), and stronger negative association between external motivation and treatment engagement (β= -0.17 versus β=0.04, respectively), compared to patients with personality disorders.

Discussion

Key findings and interpretation

The results of the current study show that the SDT process model specified to motivation for psychiatric treatment in a sample of outpatients with SMI: 1) shows good fit, 2) is stable across time and different patient groups and 3) is able to explain and predict clinical outcomes such as treatment engagement, psychosocial functioning and quality of life to a substantial degree. These findings suggest that SDT might be a useful foundation for interventions in the mental health care for outpatients with SMI.

Regarding the first hypothesis, it should be noted that although the results supported all the hypothesized paths in the model, additional paths were required between perceived competence and clinical outcomes which were not a-priori hypothesized. The necessity of such direct effects between competence and outcomes suggest that the patient's perception of being able to do what the treatment requires is important in achieving actual treatment engagement and realizing favourable psychosocial outcomes and quality of life, independent of the quality of their motivation for engaging in treatment. Alternative models in which autonomy support was directly related to clinical outcomes were not supported by the data. This suggests that the model with indirect effects through competence and motivational regulations was most appropriate. Further, neither did we find support for a model in which the path between perceived competence and autonomy support was reversed, which suggests that gaining a sense of competence is facilitated by autonomy. Thus, it seems that once patients experience a high degree of choice, respect and relevance of treatment, they are then most likely to also experience competence to learn and do what the treatment requires. These findings are consistent with previous studies in other health-related contexts, which have also found support for the indirect link between perceived autonomy support and health outcomes via perceived competence [217]. The strengths of the

relationships between SDT constructs and clinical outcomes suggest that especially the patient's perceived competence is imperative for engaging with treatment and achieving a better quality of life.

Considering the second hypothesis, we found that the process model was relatively stable across different time points and across different diagnostic groups of SMI patients (i.e. psychotic disorders and personality disorders). This provided further empirical support for the robustness of the SDT process model. The model was, however, slightly different at follow-up assessment for the two patient groups (model 5a compared to model 5b). After inspecting the regression estimates, it was found that both patients groups generally showed the theoretically expected associations between SDT constructs, yet to a different degree. For example, the finding that autonomy support was found to show a stronger and more stable relationship to identified motivation in patients with psychotic disorders compared to personality disorders, may indicate that patients with psychotic disorders show more stable continuous benefit from autonomy support in terms of their motivation whereas this may be more fluctuant in patients with primarily personality disorders. Also, looking at the strengths of the different regression estimates, it seems that treatment engagement in patients with psychotic disorders was most strongly associated with perceived competence (independent of the type of motivation), whereas for patients with personality disorders, treatment engagement was most strongly related to identified motivation. These findings may reflect differential effects of the motivational intervention in patients with primarily psychotic disorders compared to patients with primarily psychotic disorders [211], or alternatively, may be a reflection of different 'natural' courses of motivational changes in these groups over time. Either way, these findings could argue for a differential approach to motivational interventions in these two patient groups.

Further, although the current study shows preliminary support that SDT constitutes a robust framework for patterns through which patients become motivated to engage in treatment, future studies should investigate potential moderators of the processes described by SDT. The association between SDT constructs and various outcomes may vary in strength as a function of, for example, treatment duration, duration of illness, patient age, and type of treatment. These analyses were beyond the scope of the current study, but the detection of such moderators may have implications for the design of future SDT-based studies and interventions.

Regarding the third hypothesis, it was found that the SDT process model explained around 18% to 24% of the variance of treatment engagement, around 26% of the variance of psychosocial functioning and around 31% to 36% of the variance of quality of life. Although it is apparent that most variance in the clinical outcomes remains unexplained, these findings compare favourably to most other studies investigating models that include attitude-behaviour relationships [224]. All in all, these findings provide preliminary support for the use of SDT principles such as support of the patient's autonomy and competence to improve treatment engagement and achieve better mental health outcomes in outpatients with SMI.

Strengths and limitations

Strengths of the current study include the longitudinal component which allowed for testing of the process model at two time points, demonstrating that SDT is a robust model that has potential as the basis for interventions in outpatients with SMI. Other strengths included a relatively large sample size considering the often difficult to engage patient population, that it was a multi-center study, the correction for unreliability of measurements and testing of rivalling models.

Several limitations of the current study should be acknowledged. First, there is the possibility of misspecification of the SDT process model. For example, misspecification of the model may have occurred if (some of) the relations in the model were in fact bidirectional. These alternatives were not tested as this is not in line with SDT, but it has been noted that for example, a patient who shows better psychosocial functioning (in terms of better cognitive, social and behavioural functioning) would likely experience more competence in doing what the treatment requires [217]. However, other alternative models were adequately tested such that model misspecification is unlikely.

Second, several variables were not available in the current data set, such as perceived relatedness, other types of motivation such as intrinsic, integrated and amotivation and/or causality orientations which are also part of the larger holistic theoretical framework of SDT [48]. Nevertheless, we feel that the constructs that have been recognized as the core constructs of SDT, namely autonomy support and perceived competence [65,123,217] and different types of motivation, were included in this study.

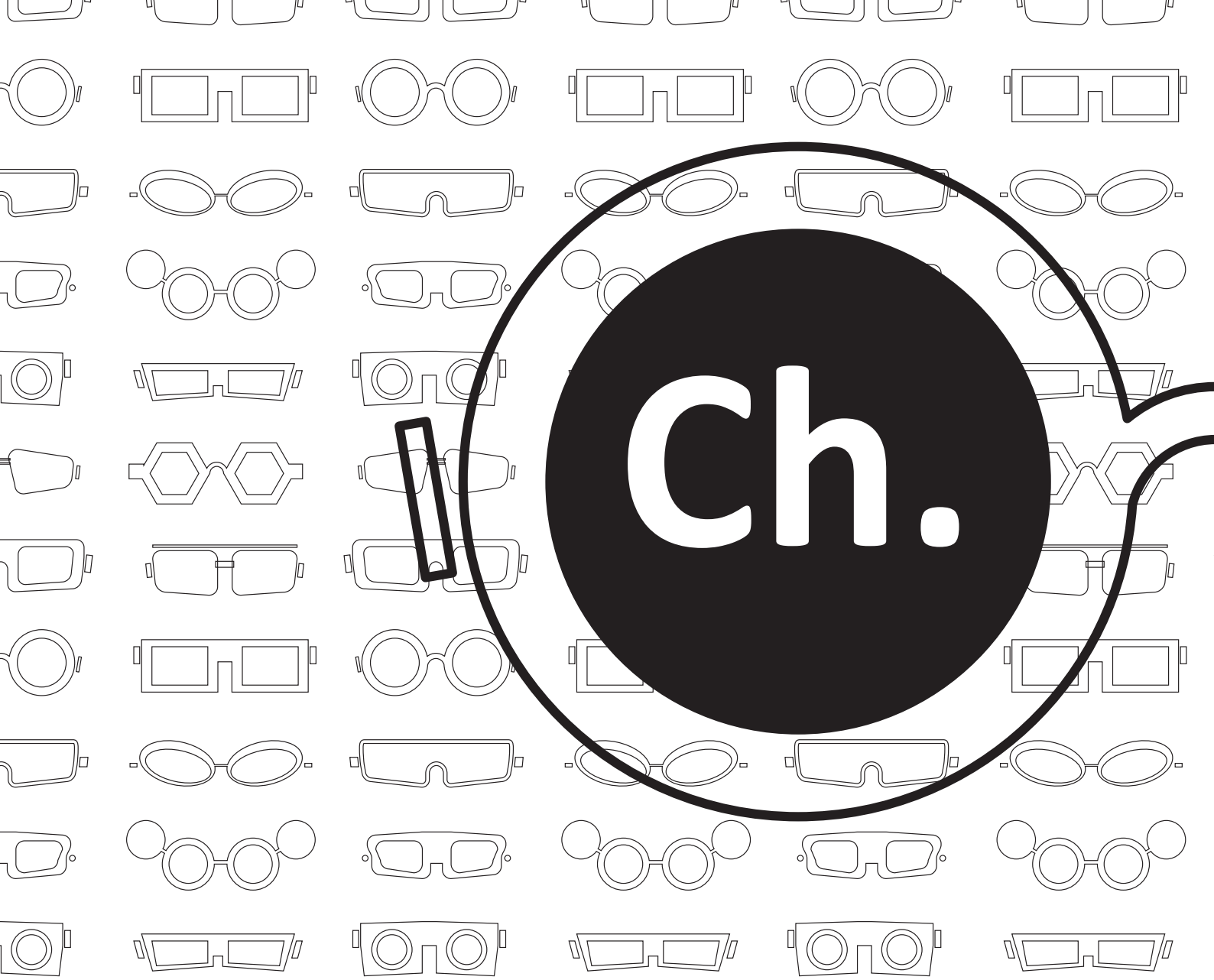
Third, the tests in the current study represent cross-sectional associations which cannot be used to infer causality. The actual utility of SDT in clinical practice for SMI patients should be proven

in experimental studies, preferably by randomized clinical trials that aim to effectively influence patient autonomy and competence. Furthermore, the process model that was tested in the current study was based on previous studies, including a meta-analysis [217], that have modelled the effects of SDT constructs disjointly, or in other words, have examined each construct separately in relation to the other constructs. Although our approach adds to the comparability of the current study to previous studies and is a preliminary step towards more research into SDT in this context, the disjoint approach does not take into account possible combinations of different levels of motivation in association with the outcomes. Future studies could benefit from a conjoint analytic approach. Such analyses, could for example include motivational profiles of patients who show high ratings on all types of motivation compared to patients who show low ratings on several or all types of motivation, or including the conjoint effects of high and low autonomy and competence, such that we could further clarify the potential synergistic, additive or antagonistic effects between these constructs.

Finally, our sample largely represents a broad population of outpatients with diagnoses of psychotic and personality disorders with a variety of co-morbid psychiatric disorders, which strengthens the generalizability of the study. The incentive of 15 euro was introduced with the aim to improve recruitment and follow-up of less motivated and less engaged patients. However, patients with relatively high levels of motivation for treatment, treatment engagement and psychosocial functioning may still have been more likely to participate in and complete the study compared to patients with low motivation, low engagement and poor functioning [28]. Also, the patients included in the current study were already engaged with services for some time, whereas future studies may aim to include patients who have just entered or who are in need for help but not yet in contact with services, who are likely to present with a different motivational profile and more variety in levels of functioning and quality of life.

Conclusion and implications

The current study showed that the relations between perceived autonomy support, perceived competence, types of motivation for engaging in treatment and clinical outcomes were in the directions hypothesized by SDT. These relations were found to be consistent across time and patient diagnostic groups and showed explanatory value, which suggests that SDT can be a useful basis for interventions in the mental health care for outpatients with SMI. The results seem to confirm that the motivational feedback intervention that was tested in the randomised controlled trial [211] was insufficient in improving patient autonomy and competence compared to usual care. Potentially fruitful future interventions might include (a combination of) more extensive training and monitoring of clinicians in the application of SDT, techniques from motivational interviewing that align with SDT [191,225], accounting for potential problems in (social) cognitive functioning of patients, as well as feedback components. Specific techniques that clinicians may use to support the needs for autonomy, competence and relatedness have been described in other papers (see for example [65,123,212]). Experimental studies based on SDT in outpatients with SMI are still scarce, which underlines the need for additional research to confirm the causality of the relations between the SDT constructs and their ability to influence treatment outcomes.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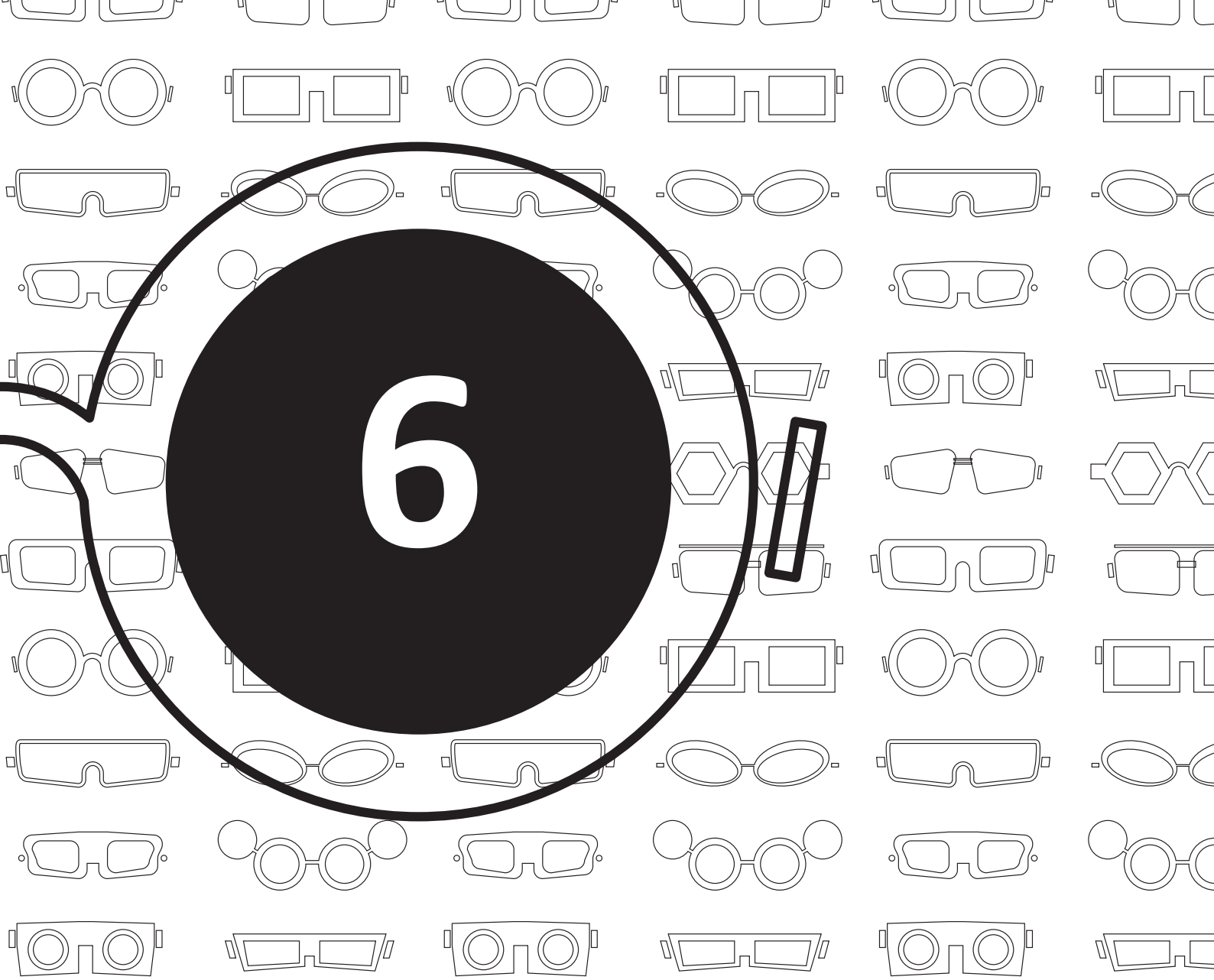
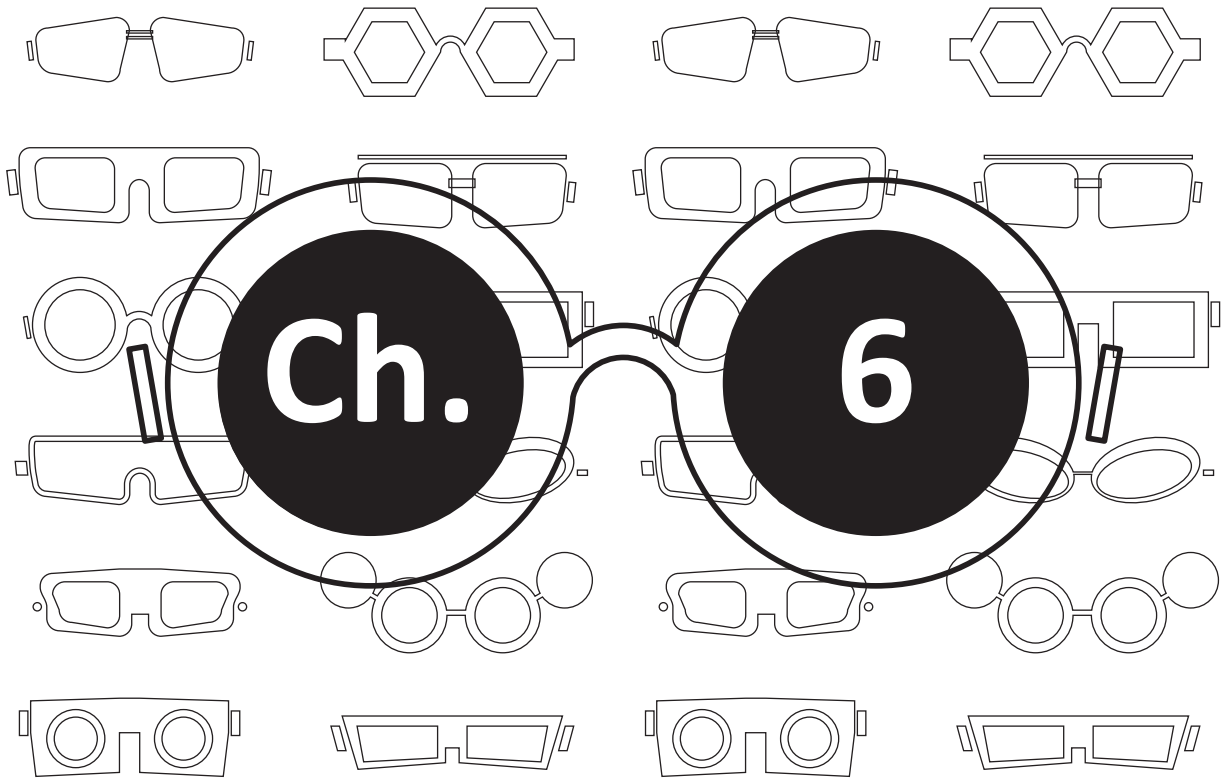


6

Testing the Integral Model of Treatment Motivation in outpatients with severe mental illness

Jochems, E. C., Duivenvoorden, H. J., Van Dam, A., Mulder, C. L., & Van der Feltz-Cornelis, C. M. (2016). Testing the Integral Model of Treatment Motivation in outpatients with severe mental illness. (Revised and resubmitted).



Objective and Methods

The Integral Model of treatment motivation (IM) is the theory underlying the Treatment Motivation Scales for Forensic patients. The current study tested the IM using structural equation modelling in a sample of 294 outpatients with severe mental illness (SMI).

Results

Congeneric estimates of reliability for the seven subscales of the TMS-f ranged from 0.61 to 0.91 in the current sample. The obtained structural model was not consistent with original theory, nor was the model invariant across time and patient groups (psychotic disorders and personality disorders). The patient's perceived suitability of treatment, perceived costs of treatment and outcome expectancy were most strongly associated with motivation and treatment engagement. The model explained between 22% and 86% of variance in clinical outcomes, depending on the timing of the assessment.

Conclusion

Currently, the IM does not constitute a robust framework for patterns through which patients become motivated to engage in treatment, but does explain substantial amounts of variance in clinical outcomes. The future potential of IM as a basis for interventions in the mental health care for outpatients with SMI is discussed, including suggestions for subsequent research and potential alterations of the IM to improve its utility for application in clinical practice.

Introduction

Background and rationale

The Integral Model of treatment motivation (IM) is a health behavior theory that was specifically developed for application in mental health treatment to understand patients' motivation for engaging in treatment [37]. The IM holds that six cognitive and emotional factors, called internal determinants [37], predict the patient's motivation for engaging in treatment. The patient's motivation is seen as the mediator between the internal determinants and actual treatment engagement. The Treatment Motivation Scales for forensic outpatient treatment (TMS-f) was developed by the founders of IM to assess the constructs in the theory [118]. A series of studies using the TMS-f in a forensic psychiatric setting showed support for its hypothesized factorial structure and showed adequate reliability and validity[116,118]. The studies also found support for the general tenets of the IM, such that three out of six internal determinants were indeed statistically significantly related to the patient's motivation for engaging in treatment, which in turn was predictive of treatment engagement [116-118]. However, the relationships between the core constructs of the IM are in need for further empirical testing, including the plausibility and utility of the model outside a forensic psychiatric population. Therefore, the current study aimed to test the IM in a sample of Dutch adult outpatients with severe mental illness using a slightly adapted version of the TMS-f. The following describes the general tenets of IM and our study objectives.

The Integral Model of treatment motivation

The IM is theoretically affiliated with Ajzen and Fishbein's theory of planned behaviour [45], with a strong focus on attitudes toward the behaviour, subjective norms, and perceived behavioural control. The theory of planned behaviour however, does not account for other factors that can influence motivation, such as distress, past experience or environmental factors, which are relevant in the context of motivation for engaging in treatment(-related behaviours)[37]. The IM does take into account these factors more explicitly and may therefore be more useful in the context of mental health care. The IM holds that the patients' MET depends on the six internal determinants (IDs), which in turn are determined by external factors such as treatment characteristics, external circumstances and patient factors. These external factors are thought to have their effect on motivation only through the IDs [37]. The IDs comprise problem recognition, distress, perceived costs of the treatment, perceived suitability of the treatment, outcome expectancy and perceived legal pressure. *Problem recognition* refers to the recognition that one has a problem, the willingness to admit to the presence of a problem and the recognition that one must change to prevent recidivism. *Distress* is the level of suffering that might result from symptoms, social problems or having fear of deterioration in any area of life. *Perceived costs of the treatment* are the fee and the time the patient feels is spent on treatment, and the psychological costs resulting from exposure to unpleasant emotions and changes in lifestyle. *Perceived suitability of the treatment* encompasses three facets: the patient's perception of appropriateness and effectiveness of the therapy, the patients' agreement with the goals of treatment and the patients' perception of the therapeutic relationship. *Outcome expectancy* refers to the patient's expectancy of being able to finish the treatment, have success and believe in the ability to change [37,116,118,160]. Finally, *perceived legal pressure* is the patient's perception of the external pressure through the legal system. As the current study will explore whether the IM is also applicable outside a forensic psychiatric setting, the current study decided to adapt the construct of perceived legal pressure into a more broad *perceived external pressure* by others. This adjustment can be justified by considering that only a subgroup of outpatients with SMI will be referred to or pressured into psychiatric treatment via the legal system, while (most) others will likely experience other pressures that drive their motivation for engaging with treatment (i.e. family, friends, partner, assertive outreaching clinicians).

Further, MET is thought to predict treatment engagement, which in turn is a predictor of treatment outcome. However, the relationship between MET and treatment engagement is not presumed perfect, because of the possibility that patients may lack the capacity to do what the treatment requires due to cognitive, neuropsychological and other limitations[37]. Also, treatment outcome may depend on the effectiveness of the treatment approach and the persistence of the patients' problems [37,117] which may result in only a modest relationship between treatment engagement and treatment outcome.

Figure 1 shows the IM as applied to the current study, including additional clinical outcomes and using perceived external pressure as one of six IDs as opposed to perceived legal pressure. In evaluating whether a motivation theory such as the IM is a "good theory", we argued that a good theory would be applicable in multiple settings (i.e. different patients groups), robust against changes across time and would be able to explain clinical

outcomes. Regarding the second criterion, it should be noted that, although patients may change in their respective levels of motivation and outcome expectancy and perceived external pressure etc. over time, the associations between the constructs in the theory should remain constant across time if the theory is correctly specified. The objectives for the current study were based on these criteria.

Objectives

1: It will be tested whether the IM-model as outlined in Figure 1 is plausible. We hypothesized that the model in Figure 1 would show good fit to the reality, as represented by the data. However, if this model does not turn out to be plausible, we will test which alternative model is most plausible.
2: It will be tested whether the most plausible model can be considered invariant across time (i.e. baseline and one year later) and across patient groups (i.e. patients with primarily a personality disorder versus those with primarily a psychotic disorder).
3: The clinical utility of the model will be evaluated by investigating to which extent the IM model explains observed variance in clinical outcomes.

Methods

Study Design

The current longitudinal study constitutes a secondary analysis of a cluster randomized clinical trial [197]. The design of this trial and the intention-to-treat analyses were reported elsewhere [197]. Findings are reported according to the STROBE guidelines [226]. The current study was approved by the Medical Ethical Committee for Mental Health Care Institutions (Dutch Trial Registry NTR2968) as well as by the scientific committees of the two specialty mental health institutions where the data were collected.

Setting

Data were collected between May 2011 and October 2013 from 12 outpatient treatment programs, including a forensic psychiatric outpatient clinic, three specialized psychotic outpatient treatment programs and eight several function-assertive community treatment teams (FACT-teams [14]) of two Dutch treatment centres: GGZ Westelijk Noord Brabant and GGz Breburg. FACT-teams provide assertive, outreaching, community-based, and supportive psychiatric services to individuals with SMI [14], such as those with psychotic disorders and severe personality disorders.

Participants and procedures

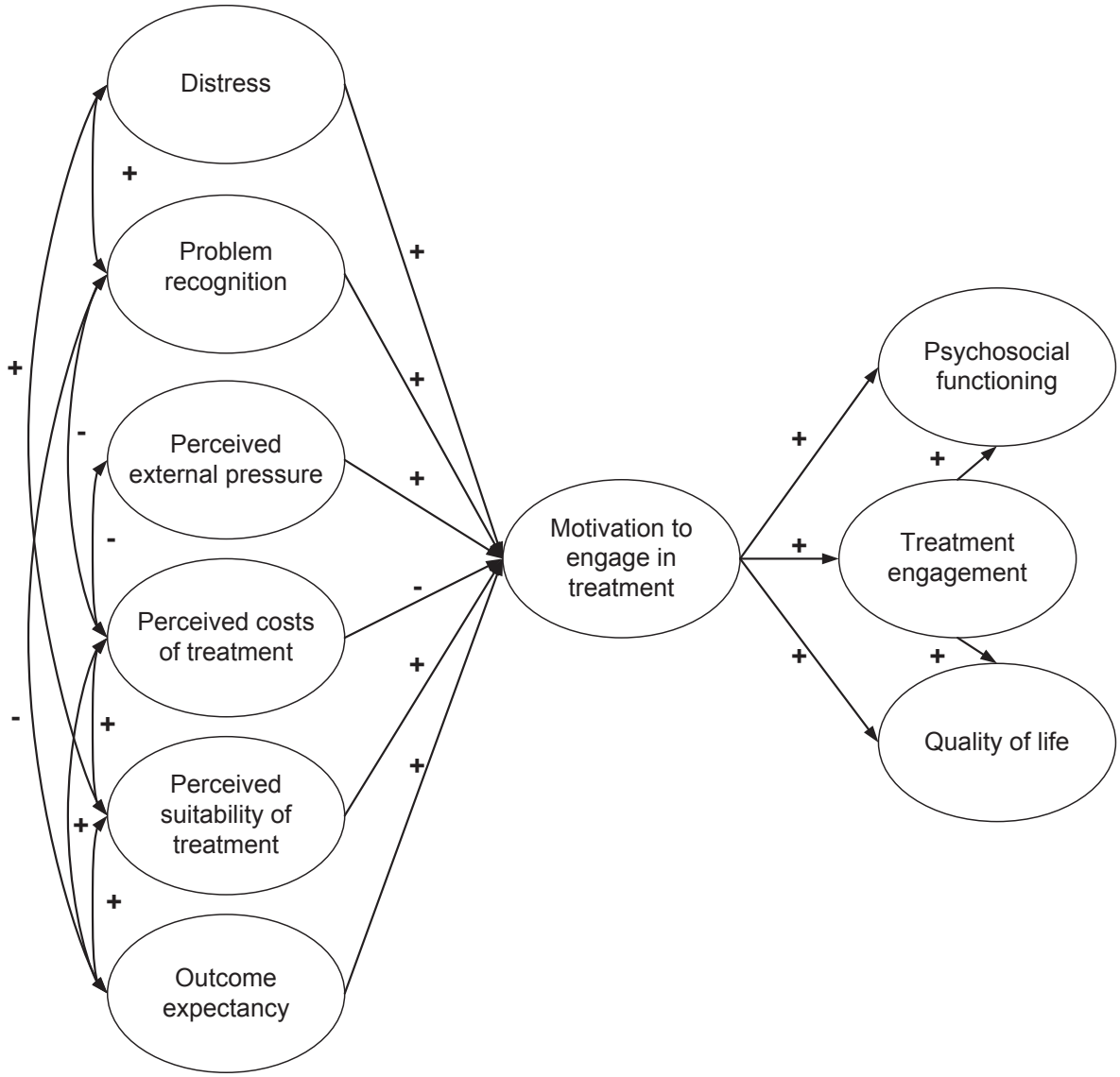
Inclusion criteria for patients were: a primary diagnosis of psychotic or personality disorder, aged 18 to 65 years, undergoing individual outpatient treatment and having a sufficient command of the Dutch language. A clinician was eligible for participation if he or she was the primary health care provider involved with the patient and saw the patient most frequently. Eligible patients on the clinicians' caseload lists were approached and informed by researchers and asked for their signed consent. Both patients and clinicians were asked to fill in questionnaires at baseline and follow-up assessment (12 months after baseline) and additionally, patients were interviewed regarding their functioning in several life domains by independent research assistants at these assessment moments. To enhance the likelihood of participation, patients were given an incentive of 15 euro for the baseline and follow-up assessment in the trial.

Measures

Core theoretical constructs of IM: Internal Determinants and motivation for engaging in treatment

Treatment motivation and the six internal determinants were measured by the Treatment Motivation Scales for Forensic patients (TMS-f). The items were rated on a 5-point Likert scale (0 = totally agree to 5 = totally disagree). The subscale scores were calculated in such a way that a higher score on the subscale represented more perception of that respective scale, including the subscale perceived costs of the treatment (i.e. higher scores represented higher perceived costs of the treatment). The subscale of perceived legal pressure was adapted to represent a more broad perceived external pressure by others. For example, where in the original TMS-f an item is 'I feel a strong pressure from the legal system', this was substituted for 'I feel a strong pressure from others'. The entire modified scale and additional psychometric properties of the adapted subscale can be found in the online supplementary material. The congeneric estimates of reliability for the seven subscales of the TMS-f for the baseline and follow-up assessment in the current study were as follows: problem recognition = 0.80 and 0.80, distress = 0.90 and 0.91, external pressure = 0.61 and 0.68, costs of treatment = 0.77 and 0.79, suitability of treatment = 0.86 and 0.89, outcome expectancy = 0.86 and 0.85, and motivation for engaging in treatment = 0.82 and 0.86, respectively. The TMS-f was found to be a reliable and valid operationalisation of the constructs in the Integral Model in previous studies [116,118]. In a previous study in outpatients with severe

Figure 1. Hypothesized model for IM



Note: The figure depicts latent variables, the observed variables and accompanying measurement errors underlying the latent variables were left out to avoid a cluttered presentation.

mental illness, we found statistically significant low to moderate correlations between the motivation subscale of the TMS-f and motivation scales derived from other motivation theories [218].

Clinical outcomes: Treatment engagement, psychosocial functioning and quality of life

Treatment engagement was measured with the Service Engagement Scale (SES) that was filled out by clinicians. The SES was developed to measure engagement with community mental health services [199]. It comprises 14 items that assess availability, collaboration, help seeking and treatment engagement behaviours, including medication adherence. The items are rated on a 4-point scale ranging from 0 (not at all) to 3 (most of the time). The SES has good internal consistency (Cronbach's α =0.87, congeneric estimate of reliability = 0.91 in the current patient sample) and validity is supported by discrimination between criterion groups [199] and significant associations with therapeutic alliance and motivation for engaging in treatment [218]. The SES total scale score was used as the outcome measure in this study, where higher scores denote higher treatment engagement.

The patient's psychosocial functioning was measured with the Dutch version of the Health of the Nations Outcome Scales (HoNOS)[163,164]. The HoNOS is a semi-structured interview with the patient in which health and social problems of the previous two weeks are quantified. It contains 12 items that refer to behavioural problems, cognitive and physical impairments, symptoms, and social functioning. HoNOS items are scored on a scale from 0 (no problem) to 4 (severe problem) . The total scale score is computed by adding the 12 items. For ease of interpretation, we reversed the total score such that higher scores reflected higher levels of psychosocial functioning. The administration of the HoNOS was performed by independent research assistants (mostly graduate students in psychology and medicine) who had no involvement in the patient's treatment. Patients were interviewed at the team office or at home, depending on their preference. The psychometric properties of the total scale score were shown to be acceptable and sensitive to change [164]. Internal consistency was acceptable in the current study (Cronbach's α = 0.70, congeneric estimate of reliability = 0.77).

The patient's quality of life was assessed with the Manchester Short Assessment of Quality of Life (MANSA)[167,168]. The MANSA is a self-report questionnaire that asks the patient how satisfied he/she is in the following life domains: living situation, social relationships, physical health, mental health, safety, financial situation, work situation and life as a whole. The 12 items are scored on a Likert scale from 1 (couldn't be worse) to 7 (couldn't be better), which are summed to calculate a total score. Higher scores denote a higher perceived quality of life. The scale is shown to be reliable (i.e. Cronbach's α = 0.82 and congeneric estimate of reliability = 0.92 in the current patient sample) and other psychometric properties are considered satisfactory [167].

Socio-demographic factors and clinical diagnosis

The DSM-IV diagnosis as made by the psychiatrist of the team was obtained from the patients' medical record, as well as socio-demographic data such as gender, age, ethnicity, age of onset and legal status. If these data were missing in the medical record, the patient was asked to provide this information.

Statistical analyses

The analyses were performed in several steps. First, the bivariate relations of variables were estimated using Spearman correlations. Structural equation modelling (SEM) as implemented in Mplus version 7.3 [202] was used to test the hypothesized relationships between autonomy support, perceived competence, types of motivation, treatment engagement, psychosocial functioning and quality of life as depicted in Figure 1.

Latent variables

Both at baseline and at follow-up we evaluated the plausibility of the IM- model using latent path analysis as outlined in Figure 1. Classical reliability theory reformulated in terms of confirmatory factor analysis enabled to identify latent variables. Congeneric reliability estimates [203,219] were obtained as both the common factors loadings and the residuals turned out to differ. Subsequently, a factor analysis model for each observed variable was defined as a basis for deriving latent variables, in which the factor loading was fixed at 1.0 and the residual variance of that factor (i.e. 1- reliability) was multiplied by the variance of the variable at issue. In doing so, the observed variables were corrected for unreliability resulting in the latent variables. This process was included in each SEM-analysis.

Testing the invariance of the structural model

As the type of design was complex (patients clustered within teams) and, in addition, the distributions of the variables were considered to be non-normal, the estimation method used was MLR. This maximum likelihood estimates standard errors and $\chi 2$ test statistic that are robust to non-normality and non-independence of observations. The MLR standard errors were estimated using a sandwich estimator. Additionally, the variable 'team' was included as an additional level in the analyses to adjust for potential clustering of the data within teams.

First, the model as depicted in Figure 1 was fitted to the data for the full sample using the baseline and follow-up measurements separately. The following measures were used to test for adequacy of the model fit: $\chi 2$ for model fit (low and non-significant values of the $\chi 2$ were desired; P-value > 0.05); $\chi 2$/df ratio (a value <2.0 was considered to be acceptable); information criteria including Akaike (AIC), Bayesian (BIC), sample-size adjusted BIC (SS-BIC) (the smaller the better); Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) (high values are desired (> 0.95), values > 1.0 point to over identification [220,221]); Root Mean Square Error of Approximation (RMSEA: a value < 0.05 indicates a close fit [222]; and Standardized Root Mean Squares of Residuals (SRMR: a value of < 0.05 indicates a reliable fit)[201]. Explained variances (R2) were used to describe the performances of the determinants for the individual dependent variables.

Subsequently, it was tested whether the baseline model showed a good overall fit. If not, it was

evaluated how it could be adapted such that the fit would improve or alternatively, whether the model could be simplified while not threatening the overall model fit. The most plausible model was obtained by evaluating the model fit criteria and standardized residuals. Further, the MLR $\chi 2$ difference test was used to compare different models which were nested. The $\chi 2$ difference was based on log-likelihood values and scaling correction factors obtained with the MLR estimator, using the formula $\Delta\chi 2 = -2*(L0 - L1)/cd$ where L0 is the log likelihood of the constrained (nested) model, L1 is the log likelihood of the unconstrained model and cd is the difference test scaling correction (which is based on scaling correction factors (c0 and c1) and number of parameters (p0 and p1) for the constrained and unconstrained models, respectively).

The invariance of the most plausible path model across time was evaluated by testing the invariance of the regression estimates of the latent variables, by comparing those assessed at baseline with those assessed at follow-up using the MLR $\chi 2$ difference test. Fitting both latent path models (baseline and follow-up) jointly was used to test whether the regression estimates of both time points could be considered invariant. Specifically, a non-significant MLR $\chi 2$ difference test between the model with all regression estimates constrained to be equal for the corresponding measurements versus all regression estimates unconstrained was considered statistical evidence for the latent path model being invariant across time. Individual estimates were regarded statistically significant if the two-sided P-values were < 0.05. The correlations of the latent variables between the corresponding measurements were allowed to be free as the measurements were repeated.

The next step was to test the invariance of the model with the regression estimates of the identified latent path models jointly at baseline and follow-up further. This was done by comparing whether this model was also invariant across different patient groups (personality disorders versus psychotic disorders). The MLR $\chi 2$ difference test was used to test equality constraints between nested models.

Explained variance of clinical outcomes

To test to what extent the obtained IM- model has utility for clinical practice, it was evaluated how much variance was explained on the dependent variables in the model, including treatment engagement, psychosocial functioning and quality of life.

Results

Participants and descriptive data

A total of 294 patients and 57 clinicians were included between May 2011 and September 2012. Patient characteristics are shown in Table 1. The majority of patients with psychotic disorders were diagnosed with schizophrenia (48%), schizoaffective disorder (16%), or psychotic disorder not otherwise specified (24%). In the group with primarily personality disorders, 40% had a borderline personality disorder, 13% had antisocial personality disorder, and 26% had a personality disorder not otherwise specified. Most clinicians were female (63%), their mean age was 44 years (SD = 10.70) and they had a mean of 16 years of clinical working experience in mental health services (SD =9.30).

After 12 months, 253 patients (86%) were re-assessed. The group that was lost to follow-up was significantly more often of non-Dutch ethnicity (48% versus 26%, $p<0.01$) and more often had a legal mandate for treatment (18% versus 7%, $p = 0.03$) compared to completers.

Table 2 shows Spearman correlations between variables that were included in the IM model. MET was most strongly correlated with the subscales perceived costs of treatment, suitability of treatment and outcome expectancy. The correlation between motivation for treatment with treatment engagement was moderate for both time points ($r = 0.28$ and $r = 0.30$, respectively). Further descriptive statistics of the TMS-f scales, including results from confirmatory factor analyses on each subscale and on the model including the six IDs as predictors for motivation, are presented in the supplementary material online. Based on these analyses, it was decided that the adapted version of the TMS-f, as used in the current study, was suitable for subsequent analyses.

Path analysis

Establishing a plausible structural model

The observed variables were divided by a factor of 10 to reduce their variances which allowed Mplus to reach convergence with less uncertainty. The observed variables were then corrected for unreliability resulting in the latent variables, which were used in the subsequent path analyses. Table 3 shows the model fit information of the models that were subjected to latent path analyses. The IM-model as depicted in Figure 1 was fitted to the data at baseline (Model 1a) and at follow-up (Model 2a). Model 1a provided a bad fit to the data ($\chi 2/df=8.30$, RMSEA=0.16, CFI=0.88, TLI=0.71, SRMR=0.13) and Model 2a provided a borderline fit ($\chi 2/df=3.94$, RMSEA=0.10, CFI=0.95, TLI=0.86, SRMR=0.09).

Table 1. Baseline characteristics of participating patients, stratified by primary diagnosis

	Total patient sample n = 294	Psychotic disorders n= 199	Personality disorders n = 95
Age, mean (SD)	44 (10.3)	43 (10.3)	45 (10.0)
Male gender, n (%)	179 (60.9)	132 (66.3)	47 (49.5)
Dutch ethnicity[A], n (%)	208 (70.7)	140 (70.4)	68 (71.6)
Education level, n (%)			
- No education/elementary	108 (36.7)	76 (38.2)	32 (33.7)
- Secondary school	124 (42.2)	75 (37.7)	49 (51.6)
- Upper high school and over	59 (20.1)	47 (23.6)	12 (12.6)
Comorbid substance use problemsB, n (% yes)	74 (25.2)	42 (21.1)	32 (33.7)
Legal mandate, n (% yes)	24 (6.9)	13 (6.5)	11 (12.0)
One or more previous admissions, n, (% yes)	227 (77.2)	159 (79.9)	68 (71.6)
Problem recognition, mean (SD)	30.2 (7.7)	28.6 (7.7)	
Distress, mean (SD)	25.7 (9.6)	23.6 (9.1)	33.8 (6.7)
External pressure, mean (SD)	30.4 (5.9)	30.2 (6.0)	30.0 (9.2)
Perceived costs of treatment, mean (SD)	19.9 (6.9)	19.8 (7.1)	30.9 (5.8)
Suitability of treatment, mean (SD)	35.0 (7.2)	35.1 (7.3)	20.3 (6.4)
Outcome expectancy, mean (SD)	31.9 (8.1)	32.5 (8.2)	34.7 (7.0)
Motivation to engage in treatment, mean (SD)	47.2 (11.7)	47.4 (11.7)	46.9 (12.0)
Treatment engagement, median (IQR)	31 (24 to 36)	32 (25 to 37)	28 (24 to 35)
Psychosocial functioning, median (IQR)	9 (6 to 13)	8 (5 to 12)	10 (8 to 15)
Quality of life, median (IQR)	5 (4 to 5)	5 (4 to 5)	4 (4 to 5)

[A] The definition of Dutch Ethnicity was based on the definition by the Dutch Bureau of Statistics.

[B] Substance abuse problem was defined as having a DSM-IV diagnosis of substance abuse and/or dependence in the medical record.

Table 2. Spearman intercorrelations of variables in the model for the total study sample

	Baseline assessment										**Follow-up assessment**									
	PR	**DS**	**EP**	**CT**	**ST**	**OE**	**MET**	**TE**	**PF**	**QL**	**PR**	**DS**	**EP**	**CT**	**ST**	**OE**	**MET**	**TE**	**PF**	**QL**
PR																				
DS	**0.54**																			
EP	**0.54**	**0.28**																		
CT	0.02	**0.35**	0.01																	
ST	0.12	**-0.34**	**0.24**	**-0.59**																
OE	-0.11	**-0.55**	0.08	**-0.61**	**0.68**															
MET	0.10	**-0.18**	0.07	**-0.50**	**0.38**	**0.51**														
TE	0.03	**-0.24**	**0.17**	**-0.26**	**0.30**	**0.30**	**0.30**													
PF	**-0.30**	**-0.56**	**-0.17**	**-0.27**	**0.20**	**0.37**	**0.18**	**0.35**												
QL	**-0.19**	**-0.57**	-0.02	**-0.32**	**0.33**	**0.45**	**0.26**	**0.37**	**0.57**											
Follow-up assessment																				
PR	**0.58**	**0.38**	**0.43**	0.02	0.09	-0.05	**0.17**	0.09	**-0.19**	**-0.13**										
DS	**0.40**	**0.68**	**0.19**	**0.25**	**-0.29**	**-0.40**	**-0.16**	**-0.19**	**-0.37**	**-0.46**	**-0.56**									
EP	**0.44**	**0.25**	**0.57**	0.00	**0.16**	0.06	**0.14**	**0.18**	-0.08	-0.05	0.63	**0.37**								
CT	0.05	**0.26**	0.00	**0.58**	**-0.48**	**-0.49**	**-0.34**	**-0.22**	**-0.25**	**-0.35**	0.14	**0.40**	0.04							
ST	0.03	**-0.28**	**0.19**	**-0.46**	**0.66**	**0.54**	**0.38**	**0.31**	**0.20**	**0.36**	0.07	**-0.37**	**0.19**	**-0.67**						
OE	-0.10	**-0.42**	0.06	**-0.43**	**0.51**	**0.61**	**0.33**	**0.23**	**0.27**	**0.41**	-0.25	**-0.60**	-0.04	**-0.70**	**0.70**					
MET	0.01	**-0.16**	0.08	**-0.37**	**0.36**	**0.38**	**0.61**	**0.28**	**0.17**	**0.27**	-0.02	**-0.28**	0.04	**-0.49**	**0.49**	**0.54**				
TE	**0.18**	-0.07	**0.23**	**-0.26**	**0.28**	**0.24**	**0.26**	**0.63**	**0.21**	**0.25**	0.09	**-0.13**	**0.23**	**-0.35**	**0.41**	**0.33**	**0.32**			
PF	**-0.22**	**-0.48**	**-0.14**	**-0.22**	**0.21**	**0.34**	**0.20**	**0.30**	**0.52**	**0.40**	-0.34	**-0.60**	**-0.20**	**-0.27**	**0.27**	**0.37**	**0.22**	**0.23**		
QL	**-0.24**	**-0.52**	-0.11	**-0.30**	**0.34**	**0.39**	**0.21**	**0.21**	**0.33**	**0.58**	-0.33	**-0.73**	**-0.21**	**-0.39**	**0.38**	**0.49**	**0.25**	**0.19**	**0.61**	

Boldface indicates p < 0.05 (two-tailed). Problem recognition, Distress, External pressure, Perceived costs of treatment, Perceived suitability of treatment, Outcome expectancy , Motivation to engage in treatment, Treatment engagement, Psychosocial functioning, Quality of life.

Table 3. Model fit information

Model	χ2	df	χ2/df	p-value	RMSEA	90% C.I. for RMSEA	CFI	TLI	SRMR	AIC	BIC	SS-BIC
1a. Baseline (as in Figure 1)	149.40	18	8.30	<0.01	0.16	0.14 to 0.18	0.88	0.71	0.13	4567	4740	4591
1b. Baseline (as obtained by Drieschner & Boomsma[116], version 1)	141.93	19	7.47	<0.01	0.15	0.13 to 0.17	0.89	0.74	0.12	4560	4730	4584
1c. Baseline (as obtained by Drieschner & Boomsma[116], version 2)	77.97	15	5.20	<0.01	0.12	0.09 to 0.15	0.94	0.83	0.05	4497	4681	4522
1d. Baseline (start-model)	0.00	0	-	<0.01	0.00	0.00 to 0.00	1.00	1.00	0.00	4448	4688	4482
1e. Baseline (constricted paths between IDs and PF/QL)	14.68	10	1.47	0.14	0.04	0.00 to 0.08	1.00	0.98	0.02	4441	4644	4469
1f. Baseline (model 1e plus additional constricted paths between IDs and TE)	19.57	14	1.40	0.14	0.04	0.00 to 0.07	1.00	0.98	0.02	4436	4624	4462
2a. Follow-up (as in Figure 1)	71.00	18	3.94	<0.01	0.10	0.08 to 0.13	0.95	0.86	0.09	-1256	-1083	-1232
2b. Follow-up (as obtained by Drieschner & Boomsma[116], version 1)	109.02	19	5.74	<0.01	0.13	0.10 to 0.15	0.91	0.78	0.09	-1243	-1074	-1220
2c. Follow-up (as obtained by Drieschner & Boomsma[116], version 2)	101.39	15	6.76	<0.01	0.14	0.12 to 0.17	0.91	0.73	0.07	-1251	-1066	-1225
2d. Follow-up (start-model)	0.00	0	-	<0.01	0.00	0.00 to 0.00	1.00	1.00	0.00	-1317	-1078	-1284
2e. Follow-up (constricted paths between IDs and PF/QL)	12.71	10	1.27	0.24	0.03	0.00 to 0.07	1.00	0.99	0.02	-1321	-1118	-1293
2f. Follow-up (model 1e plus additional constricted paths between IDs and TE)	18.19	14	1.30	0.20	0.03	0.00 to 0.07	1.00	0.99	0.02	-1321	-1133	-1295

Note: χ^2 = chi-square statistic; df = degrees of freedom; RMSEA = root mean square error of approximation; CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, SRMR = standardized root mean square residual; AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, SS-BIC = Sample size adjusted BIC.

In search for a more plausible model, modification indices and, in particular, standardized residuals were inspected. These did not provide theoretically plausible nor unequivocal suggestions for improving model fit. That is, the indices pointed to several lacking direct effects between internal determinants and clinical outcomes (treatment engagement, psychosocial functioning and quality of life), some of which were opposite to theoretical expectations. Therefore, it was decided to investigate whether the structural model that was empirically obtained by Drieschner and Boomsma [160] would show better fit to the data than the originally hypothesized model.

The empirically derived model by Drieschner and Boomsma [160] was tested across both time points and labelled as model 1b (baseline) and model 2b (follow-up) in Table 3. This model included indirect paths from problem recognition, outcome expectancy and costs of treatment to treatment engagement via MET (while the paths between the remaining three internal determinants and MET were constrained to 0), and direct paths from suitability of treatment, external pressure and MET to treatment engagement. Additionally, psychosocial functioning and quality of life were determined by both treatment engagement and MET. In a second version of this model, psychosocial functioning and quality of life were also determined by suitability of treatment and external pressure (models 1c and 2c). The results in Table 3 show that model fit improved slightly but remained borderline for baseline assessment (models 1b and 1c), whereas it became worse for the follow-up assessment (models 2b and 2c) compared to the model depicted in Figure 1. Thus, these models did not show acceptable fit to the data.

In search for a more plausible model, a model was chosen which included paths from all predictors to all subsequent variables in the model. The fit of this model (which we labelled 'start-model') was perfect for both assessment moments (see models 1d and 2d in Table 3). Subsequently, a backward elimination procedure was applied to the start-model to obtain a more constrained model while not statistically significantly reducing model fit. The MLR χ2 difference test was used to compare nested rivalling models on model fit. The backward procedure started with the constriction of paths from the internal determinants to the distal outcomes (psychosocial functioning and quality of life) as these paths were least in line with theory [37]. Specifically, the regression paths were sequentially constrained to zero between each internal determinant and the two distal outcomes to determine which constrictions were acceptable, i.e. did not statistically significantly reduce model fit. It was found that all paths between the internal determinants and two distal outcomes could be constrained to zero except for the path between distress and both outcomes. The fit for this model for both assessment moments is presented in Table 3 (models 1e and 2e) and Table 4a shows the results of the MLR χ2 difference test between the start-model (models 1d and 2d) and the constrained models (models 1e and 2e).

Table 4a. Model comparisons to test for constrictions of the start-model

Model	C or U	χ2	df	χ2/ df	Δ X2	Δ df	Δ X2 / Δ df	p-value	Interpretation based on statistical inference
1d. Baseline (start-model)	U	0.00	0	-	14.68	10	1.47	0.14	The more constricted model can be retained without significant loss of model fit
1e. Baseline (constricted paths between IDs and PF/QL)	C	14.68	10	1.47					
1d. Baseline (start-model)	U	0.00	0	-	19.57	14	1.40	0.14	The more constricted model can be retained without significant loss of model fit
1f. Baseline (model 1e plus additional constricted paths between IDs and TE)	C	19.57	14	1.40					
2d. Follow-up (start-model)	U	0.00	0	-	12.71	10	1.27	0.24	The more constricted model can be retained without significant loss of model fit
2e. Follow-up (constricted paths between IDs and PF/QL)	C	12.71	10	1.27					
2d. Follow-up (start-model)	U	0.00	0	-	18.19	14	1.30	0.20	The more constricted model can be retained without significant loss of model fit
2f. Follow-up ((model 1e plus additional constricted paths between IDs and TE)	C	18.19	14	1.30					

Table 4b. Model comparisons to test for robustness of the obtained model across time and patient groups

Model	C or U	χ2	df	χ2/ df	Δ X2	Δ df	Δ X2 / Δ df	p-value	Interpretation based on statistical inference
3a. Baseline and follow-up jointly (as 1f and 2f)	U	244.94	86	2.85	247.47	15	16.50	<0.01	The model is variant across time
3b. Baseline and follow-up jointly (as 1f and 2f)	C	589.39	101	5.84					
4a. Baseline process model (as 1f) for psychotic versus personality disorders	U	31.11	28	1.11	17.57	15	1.17	0.29	The model is invariant across patient groups at baseline
4b. Baseline process model (as 1f) for psychotic versus personality disorders	C	48.92	43	1.13					
5a Follow-up process model (as 2f) for psychotic versus personality disorders	U	50.67	28	1.81	38.00	15	2.53	<0.01	The model is variant across patient groups at follow-up
5b Follow-up process model (as 2f) for psychotic versus personality disorders	C	87.25	43	2.03					

Note: C or U = Model with either constrained (C) or unconstrained (U) regression coefficients for corresponding measurements at baseline and follow-up. The constrained (nested) model is the more constrictive model with more degrees of freedom than the comparison model. The grey and white shading indicates models that are rivalling (nested) models (similar shading indicates rivaling models). χ^2 = chi-square statistic; df = degrees of freedom; Δ χ^2 = chi-square value of the MLR difference test, Δ df = difference in degrees of freedom between the models being compared. IDs = internal determinants; PF = psychosocial functioning; QL = quality of life; TE = treatment engagement.

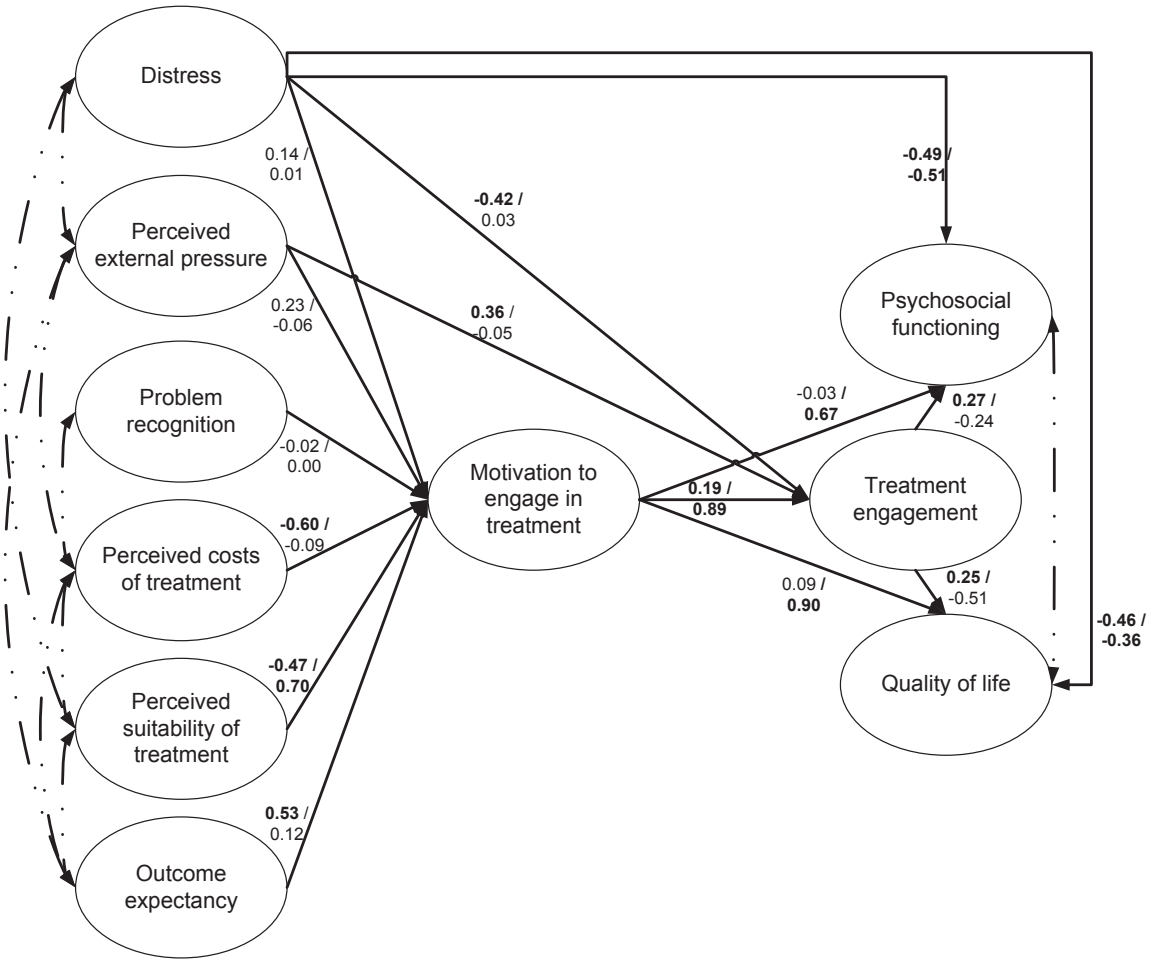
Subsequently, it was investigated if the path from MET to the distal outcomes could be constrained to zero, which was acceptable for the baseline model but not for the follow-up assessment. It was therefore decided to retain this path in the model unconstrained. Then, it was investigated which paths from the internal determinants to treatment engagement could be constrained to zero without significant loss of model fit. It was found that all paths from internal determinants to treatment engagement could be constrained to zero, except for the paths from distress and external pressure to treatment engagement (see Table 4a for the MLR χ2 difference test between the start-model and models 1f and 2f). This model was accepted as the final model, as further constrictions (e.g. between the IDs and MET) would hinder the testing of the 'core' of the original theory which consists of the mediating role of motivation between the six internal determinants and treatment engagement [37].

Figure 2 shows the accepted final structural model, in which it can be seen that the strongest positive associations were found from perceived suitability of treatment, perceived costs of treatment and outcome expectancy to motivation for engaging in treatment, whereas strong negative associations were found between distress and treatment engagement, psychosocial functioning and quality of life.

Test of the IM process model across time and across patient groups

Testing the obtained process model across time was done by testing the invariance of the regression estimates of the latent variables across the two measurement occasions. A model was created in which both baseline and follow-up latent path models were included simultaneously (Model 3). In the first version of this model the regression weights were allowed to be free (unconstrained) for the

Figure 2. Testing the obtained process model for IM across time on clinical outcomes



Note: The figure represents Model 3a, with all regression coefficients left unconstrained for the corresponding measurements at baseline and follow-up (i.e. indicating that these are variant across time). Numbers represent standardized regression coefficients for the corresponding path (baseline / follow-up). Thick lines represent regression paths, dotted lines represent intercorrelations of variables. Boldface indicates statistical significance at p<0.05 (two-tailed). The figure depicts latent variables, the observed variables and accompanying measurement errors underlying the latent variables were left out to avoid a cluttered presentation.

baseline and follow-up measurements (Model 3a), which resulted in borderline fit to the data (χ2 / df = 2.85, RMSEA = 0.08, CFI = 0.94, TLI = 0.86, SRMR = 0.08). Then, a second version of this model was created in which the regression weights for the corresponding paths at baseline and follow-up were constrained to be similar (Model 3b). Compared to Model 3a, Model 3b provided much worse fit to the data (χ2/df = 5.84, RMSEA=0.13, CFI=0.80, TLI=0.63, SRMR=0.17). The test for invariance across time was represented by the MLR χ2 difference test between Models 3a and 3b, where a non-significant χ2-test was considered statistical evidence for the latent path model being invariant across time. As can be seen in Table 4b, the χ2-test reached statistical significance (Δχ2=247.47, Δdf=15, p=<0.01), implying that the IM model was not invariant across time. That is, the regression coefficients between variables in the model could not be considered similar for the baseline and follow-up assessments, as at least some of these were significantly different for the two time points. Model 3a is shown in Figure 2, including standardized regression coefficients for the baseline and follow-up measurements.

Additionally, it was tested whether the IM model could be considered invariant across different patient groups. To this end, the IM model was tested for differences between the group of patients with a primary diagnosis and patients with a primary diagnosis of a personality disorder. First, it was tested whether this model at baseline (Model 1f) could be considered invariant across patient groups by evaluating the χ2-difference test, which compared the model with all corresponding

regression estimates constrained to be equal for the two patient groups (Model 4b) to the model where all regression estimates were unconstrained for the two patient groups (Model 4a). Table 4 shows the results for this comparison and it can be seen that the χ2-test did not reach statistical significance (Δχ2=17.57, Δdf= 15, p=0.29), which provided support for the hypothesis that the IM model was invariant across these different patient groups at the baseline measurement.

The same procedure was repeated for the IM process model at follow-up. Here, it was found that the χ2-test for nested models did reach statistical significance (Δχ2=38.00, Δdf= 15, p<0.01), which was interpreted as the IM process model being not invariant across the patient groups at follow-up. That is, although the two patient groups could be described by a similar structural model at baseline (i.e. the regression coefficients between variables in the model at baseline were not significantly different between the groups), this was not the case for the follow-up assessment. Further testing of differences between patient groups with models that included both time points simultaneously also showed that the two patient groups were not invariant. In sum, these tests of the obtained IM process model suggest that this model is not stable across time nor across patient groups.

Variance explained and predictive value of the IM process model

It can be seen in Table 5 that the obtained IM process model explained between 22% to 86% of treatment engagement, between 38% to 43% of psychosocial functioning and between 31% to 42% of quality of life, depending on the timing of the assessment.

Table 5. Variances explained by the IM process model

	Variance (R^2)			
Model	**MET**	**TE**	**PF**	**QL**
1. Baseline	**0.44**	**0.22**	**0.38**	**0.42**
2. Follow-up	**0.73**	**0.86**	**0.43**	**0.31**

Note: MET = motivation to engage in treatment; TE = treatment engagement; PF = psychosocial functioning; QL = quality of life. N.a. = not applicable. Boldface indicates p<0.05 (two-tailed).

Discussion

Key findings and interpretation

Regarding the first objective, the hypothesized mediational effect of motivation for engaging in treatment between internal determinants and treatment engagement was only partially supported. It was found that motivation fully mediated the effects of problem recognition, suitability of treatment, costs of treatment and outcome expectancy on treatment engagement. However, the model did not show a good model fit until additional direct paths between distress and all clinical outcomes were incorporated. Also, perceived external pressure was found to be of direct influence on the patient's treatment engagement, independent of a mediational effect by motivation. Thus, the final structural model was not in line with original hypothesized theory nor similar to the obtained empirical model which was previously found by Drieschner and Boomsma in a forensic psychiatric research population [116], in which the patient's motivation for engaging in treatment mediated the relations between problem recognition, outcome expectancy, costs of treatment and treatment engagement.

Regarding the second objective, the obtained plausible model was not stable across time nor across different patient groups. These findings indicate that this theory in its current form does not constitute a robust framework for patterns through which patients become motivated to engage in treatment. On the one hand, it is not surprising that the identified model differs between patients with psychotic disorders and personality disorders, or that this is different for forensic psychiatric outpatients compared to outpatients with severe mental illness (with or without a history of offending). On the other hand, it would have strengthened the utility and generalizability of the theory if similar patterns of associations between motivational variables would appear across time and across different patient populations. Future studies should aim to replicate the current study in other populations and aim to explain (if and) why these differences occur. In addition, since the patient's quality of life and psychosocial functioning are of great interest to treatment outcomes, future studies may aim to explore subdomains within these outcomes and how this affects the fit of the model.

Despite these findings regarding the structure and stability of the IM, the current study does provide insight into which factors are most relevant for the patient's motivation and treatment engagement. Both our work and that of Drieschner and Boomsma [160] showed that perceived suitability of treatment, perceived costs of treatment and outcome expectancy were most strongly associated with motivation and treatment engagement. These determinants comprise the patient's perception of the treatment and relationship with the clinician, the perception of the investment that is needed and the perceived competence in being able to do what the treatment requires, and the findings underscore

their importance in relation to motivation and treatment outcomes.

Further, the level of distress is generally regarded an important determinant of treatment motivation, such that more (symptomatic) suffering makes patients more motivated to engage in treatment [227]. Indeed, studies have found that treatment-seeking patients with personality disorders or substance-use disorders reported higher subjective distress than those who did not seek treatment [228,229]. However, others have found a so-called 'motivation paradox' in patients with SMI, such that those with more symptoms and more psychosocial problems are less motivated for engaging in treatment [230]. This latter observation is consistent with the current study, where distress showed a negative association with treatment engagement and was unrelated to motivation for engaging in treatment (controlling for the other internal determinants). Drieschner and Boomsma found similar results in their studies in forensic psychiatric patients [116]. This implies that, higher distress may withhold outpatients with SMI from in engaging with treatment, which may be related to the finding that higher distress is also associated with lower outcome expectancy and lower perceived suitability of treatment (see Table 2). For patients where distress is high and other motivational determinants are low, this may provide an argument for the paternalistic practices as performed by the assertive outreach teams, trying to engage patients who might otherwise be left untreated [230]. These patients might be engaged by first increasing the external (legal) pressure, as – again similar to the findings of Drieschner and Boomsma [116] - we found that perceived external (legal) pressure was directly related to treatment engagement, whereas no significant association between external pressure and motivation was found. These findings suggest that patients may engage in treatment due to external pressures, regardless of how motivated they are (by themselves).

Regarding the differences between the structural models at the two time points, it seems remarkable that not only the strengths of the relationships between the IDs and motivation were different , but also – in some cases – the direction of these relationships. For example, the correlation between perceived suitability of treatment and motivation was positive (see Table 2), but when corrected for the influence of the other internal determinants resulted in a negative association at baseline, and again a positive association at follow-up (see Figure 2). After ruling out the possibility of multicollinearity problems, we interpreted this finding as valid and indicating that the interrelations of the internal determinants are more complex than the current theory suggests. This should therefore be subject of subsequent investigations of the IM.

Thirdly and finally, the obtained plausible model was able to explain substantial amounts of variance in treatment engagement, psychosocial functioning and quality of life. The model explained between 22% to 86% of treatment engagement, between 38% to 43% of psychosocial functioning and between 31% to 42% of quality of life, depending on the timing of the assessment. The discrepancy between explained variances at baseline and at follow-up may be explained by the relative contributions of perceived suitability of treatment and motivation, which were more pronounced at the follow-up assessment. All in all, this suggests that the concepts contained within the IM hold potential to predict treatment outcomes, which warrants further empirical investigation into the IM.

Strengths and limitations

Strengths of the current study include the longitudinal component which allowed for testing of the model at two time points, a relatively large sample size considering the often difficult to engage patient population, that it was a multi-center study, the correction for unreliability of measurements and testing of rivalling models.

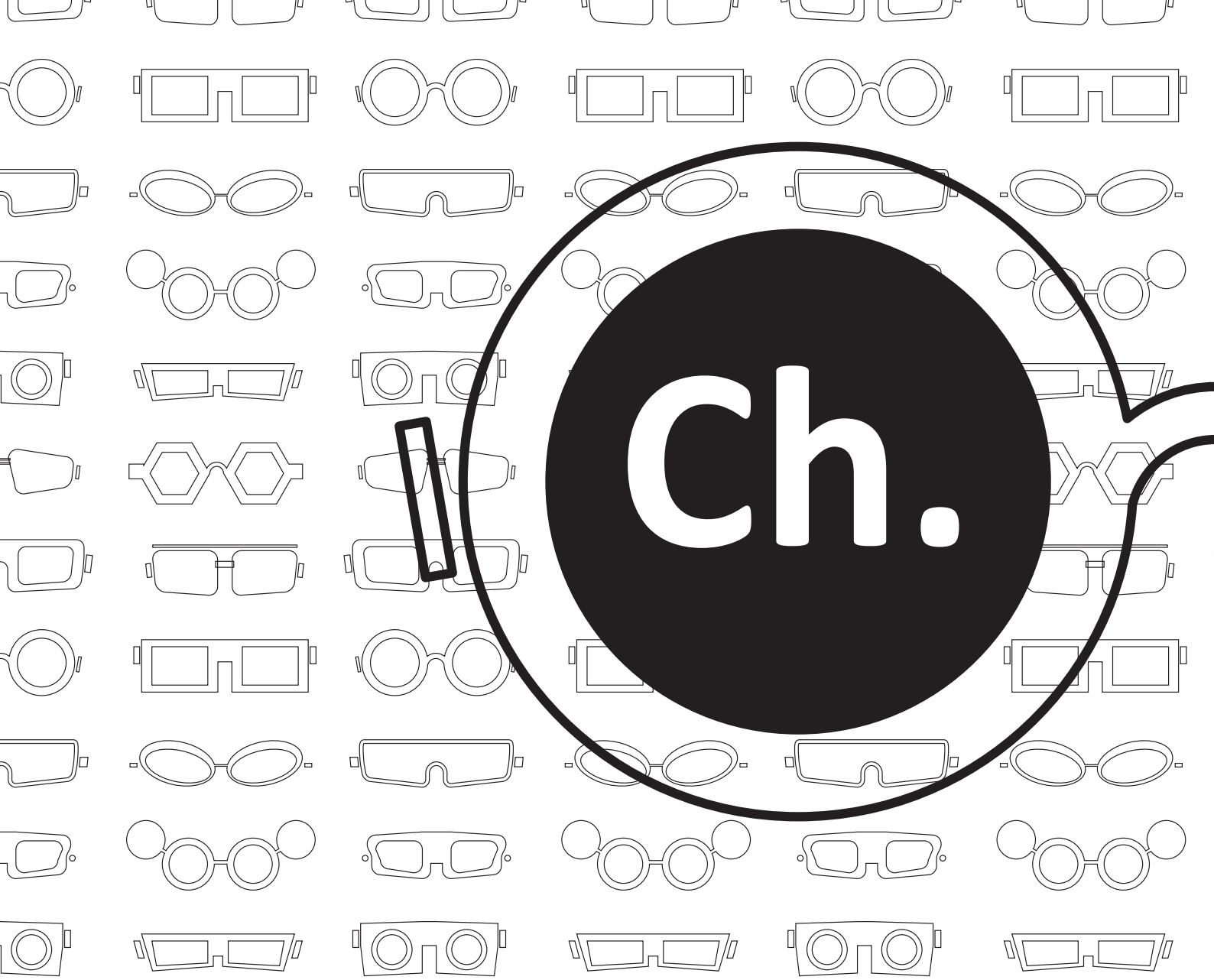
Limiting the current study is the possibility of model misspecification, which should not be underestimated. Misspecification of the model may have occurred due to misspecification of the relations between the internal determinants or if some of the relations in the model were actually bidirectional (such as between distress and psychosocial functioning and quality of life). These alternatives were not tested as these were not in line with IM, but the idea of reciprocal relationships between some of the variables in the model is actually possible. For example, not only may motivation for engaging with treatment depend on the patient's outcome expectancy, but in turn the patient's outcome expectancy may depend on (previous) motivation for engaging in treatment and previous treatment engagement behaviours. Such relations are likely for ongoing, repeated behaviours [77] as is the case in our study sample, where patients were not new to treatment but most had been in treatment for many years. Further, although efforts were made to compare different structural models and to identify a model which was most plausible considering both theory and data, our final model was based on a backward elimination approach which opens the possibility of a ranking and selection problem. That is, the constriction of certain paths in the model

to zero (i.e. “dropping them”), was based on this study sample which might not be generalizable to other samples let alone to the entire population of outpatients with SMI.

It is considered a strength that our sample largely represents a broad population of outpatients with diagnoses of psychotic and personality disorders with a variety of co-morbid psychiatric disorders, which strengthens the generalizability of the study. However, patients with relatively high levels of motivation for treatment, treatment engagement and psychosocial functioning may still have been more likely to participate in and complete the study compared to patients with low motivation, low engagement and poor functioning. Therefore, the results may not be generalizable to the entire population of outpatients with SMI, in particular those patients who are not in contact with services. Future studies should further investigate the generalizability of the TMS-f and the adapted version that was used in the current study, to other patient populations and nationalities, as the scales and the conceptual framework of the IM may prove useful in the understanding and communication about motivation for engaging with treatment services in other mental health contexts as well.

Conclusion and implications

The current study showed that the relations between internal determinants, motivation for engaging in treatment, treatment engagement and clinical outcomes were not consistent with the original theory, nor were they consistent across time and different patient diagnostic groups. Future studies should aim to test the IM in other clinical populations, to further specify the relations between constructs in the model and to re-specify (or reject) the initially hypothesized principles. Depending on the context of these future studies, researchers may choose to use the original TMS-f, or to use the version that was used in the current study in which the legal pressure subscale was adapted to represent external pressure. The IM might be improved by re-specifying the interrelations of the internal determinants and/or by including intermediary factors such as action planning between the level of MET and the actual treatment engagement [86,115]. Including such intermediary factors might create opportunities to beneficially influence the pathway to treatment engagement. The constructs in the model did show explanatory value, which demonstrates the future potential of IM (constructs) as a basis for interventions in the mental health care for outpatients with SMI. In further testing of the theory, it will become more accurate and thus more useful for application in clinical practice. Clinical implications of our findings include that perceived suitability of treatment, perceived costs of treatment and outcome expectancy currently seem the most interesting targets for interventions aimed at improving motivation and treatment engagement.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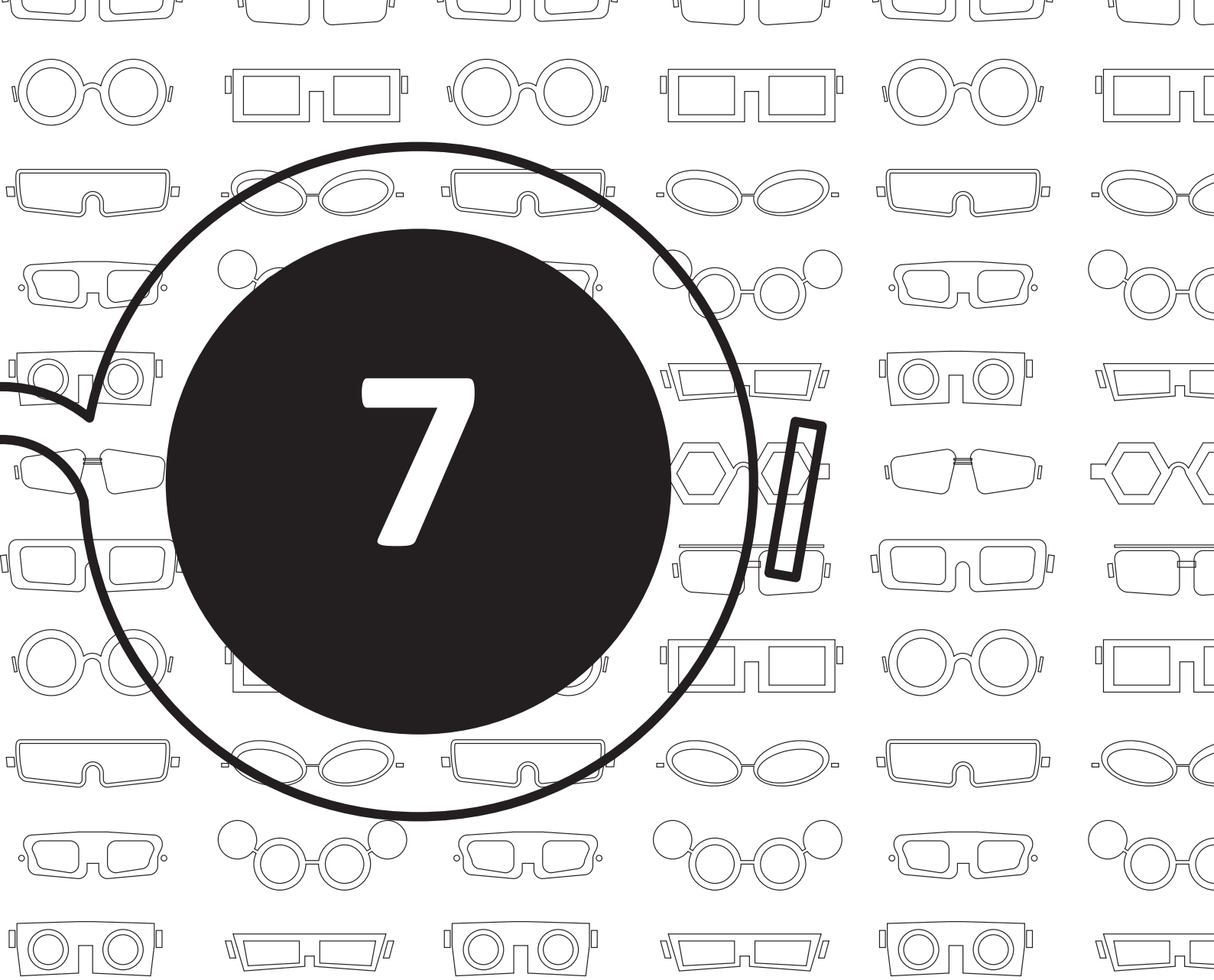
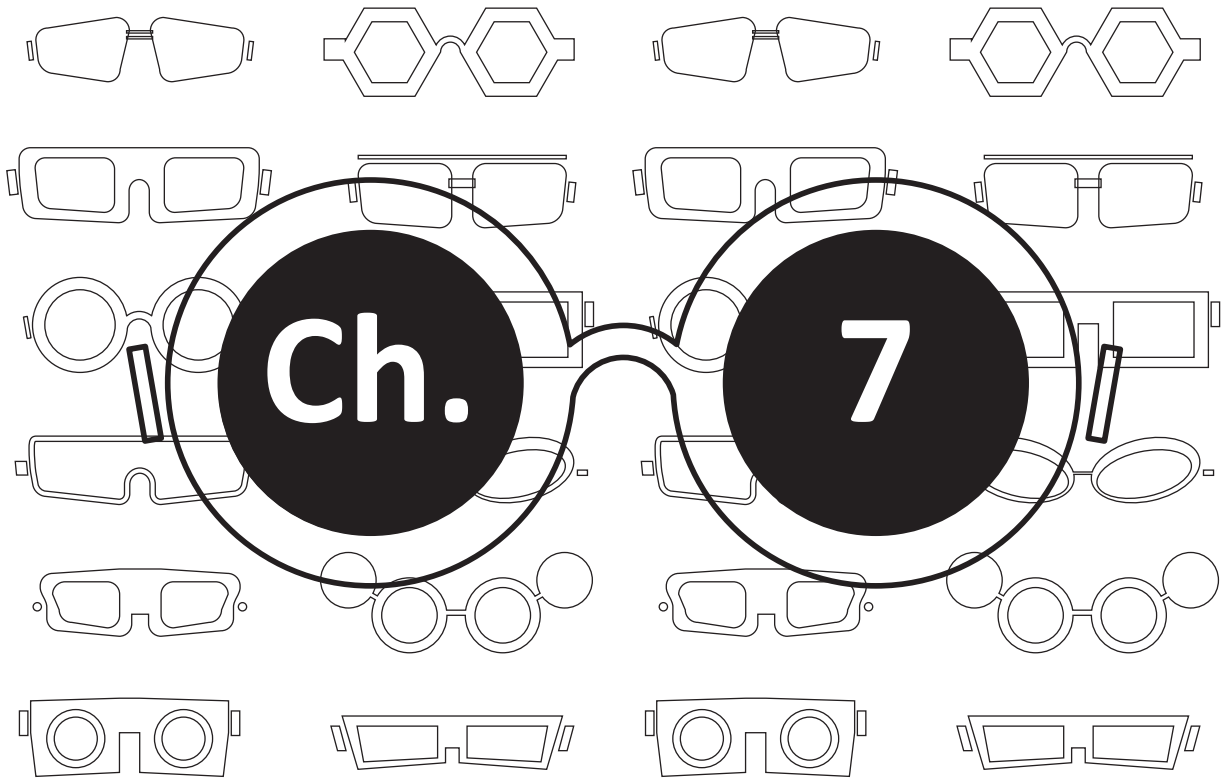


7

The TransTheoretical Model Stages of Change for Motivation to Engage with Psychiatric Treatment in Outpatients with Severe Mental Illness

Jochems, E. C., Duivenvoorden, H. J., Van Dam, A., Van der Feltz-Cornelis, C. M., & Mulder, C. L. (2016). The TransTheoretical Model Stages of Change for Motivation to Engage with Psychiatric Treatment in Outpatients with Severe Mental Illness. (Submitted).



Objective and Methods

The stages of change (SoC) described by the TransTheoretical Model (TTM) provide a potentially useful framework for evaluating the motivation of patients with severe mental illness (SMI) to participate in treatment for their psychiatric problems, yet no studies to date have evaluated stage instruments for such applications. Two assessment methods for SoC, namely a staging algorithm and the University of Rhode Island Change Assessment, were studied using structural equation modelling in a sample of 294 SMI outpatients. Convergent validity and criterion validity were evaluated.

Results

It was found that the two measures showed low convergence and thus seem to assess different aspects of motivation to engage with psychiatric treatment. For both assessment methods, the TTM stages only partially showed the theoretically expected associations with other TTM constructs and treatment engagement. Further, the instruments explained only 3% to 16% of variance in treatment engagement.

Conclusion

These findings reveal important problems in the applicability of staging measures to the engagement of patients with SMI in outpatient psychiatric treatment, and currently do not support their use in clinical practice. Future studies should focus on evaluating other SoC measures as a foundation for further research into the utility of the TTM in psychiatric treatment services.

Introduction

Background and rationale

The TransTheoretical Model (TTM) [44] is one of the most frequently used models in daily clinical practice to assess and address motivation for behaviour change [63]. According to the TTM, effective health behaviour intervention strategies are those which are tailored to the patient's stage of change. That is, clinicians should aim to identify their patients' readiness to change by specifying in which one of five stages the patient is in: precontemplation (not planning to change or even resistant to change), contemplation (considering change but not yet planning it), preparation (preparing to change soon), action (behaviour change has recently been achieved) or maintenance (long-term behaviour change has been achieved) [53]. When the appropriate stage is identified, specific interventions should be offered to help patients progress to the next stage or to maintain changes made [54]. Typically, the TTM is regarded as a model for motivation for change, as the motivation to engage in behaviour change increases with each progressive stage until action is taken, after which the level of motivation must be maintained to consolidate the changes made [86]. TTM researchers have evaluated two distinct but related aspects of motivation: motivation for change and motivation for engaging in treatment [53]. Although related, these two concepts are not equivalent, as patients may want to change their health behaviour problem without professional help. Vice versa, patients can come into treatment and be motivated to engage in treatment activities but still be reluctant to change their health behaviour problems [53]. For these latter patients, engaging in treatment may be the first step towards behaviour change if they are supported in developing motivation, which may take months or even years [231].

The TTM has been applied to numerous health behaviours and settings[54], and may also be useful for application in psychiatric treatment services for patients with severe mental illness (SMI), such as patients with psychotic disorders, personality disorders and co-occurring SMI and substance use-disorders (dual diagnosis) patients [58,86]. Current studies suggest that TTM constructs can explain outcomes for patients with a dual diagnosis [57-59], and that the TTM constructs are associated with physical activity in patients with schizophrenia spectrum disorders [60,61] and with drop-out from dialectical behavioural therapy for patients with borderline personality disorder [62]. A meta-analysis on the relations between stages of change and processes of change applied to psychotherapy, found that "the majority of published research concerns health behaviours and addictive disorders, as contrasted with the wide range of Axis I disorders" (p. 151)[63]. It appears that the TTM has been understudied regarding motivation for changing psychiatric problems in outpatient treatment for patients with SMI, despite its potential in this domain. For example, it would be relevant for clinicians to know whether the stages regarding motivation for changing psychiatric problems by engaging with treatment can objectively be identified and which instrument is most useful for assessing the stages. Further, it would be relevant for clinicians to know whether the stages are associated with actual treatment engagement and clinical outcomes (in the manner hypothesized by TTM).

Previous studies in patients with substance use problems have found that associations between stages and clinical outcomes may vary depending on the type of stage assessment (e.g. using an algorithm versus a continuous scale)[93,232]. It is unknown, however, how the (measures of the) TTM model perform in outpatients with SMI, rendering it important to evaluate different types of instruments for assessing stages of change in clinical practice to decide which of the two types has the highest predictive power regarding treatment engagement. Therefore, the purpose of the current study is to examine the plausibility and utility of the TTM stages of change regarding the engagement with outpatient psychiatric services for patients with SMI, using two popular methods of stage assessment to evaluate which instrument is most applicable in clinical practice.

Hypotheses from the Transtheoretical Model

Figure 1 shows how the TTM holds that people progress through the five stages to accomplish behaviour changes and that this progression is cyclical rather than linear (see bottom left of Figure 1). People may move forward and backward through the stages of change, as relapse is common to the change process [53]. As noted previously, the TTM proposes several mechanisms of change, including ten processes of change, that guide movement through the stages. Prochaska, Redding and Evers have noted that: *"To help people progress from precontemplation to contemplation, such processes as consciousness raising and dramatic relief should be applied. Applying processes like contingency management, counterconditioning, and stimulus control to people in precontemplation would represent a theoretical, empirical, and practical mistake. But for people in action, such strategies would represent optimal matching"* (p. 106)[54]. Across

the ten processes of change, two higher-order constructs have been identified which are referred to as experiential and behavioural processes of change [96]. According to the authors of TTM, experiential processes are used in early stages and include the cognitive, affective, and evaluative processes to progress through stages [96]. In later stages, people rely more on commitments, conditioning, contingencies, environmental controls, and support for progressing toward maintenance or termination, which together make up the behavioural processes of change[96].
Movements through stages are marked by a shift in decisional balance, which is the patient's perception of the pros and cons of changing, and by an increase in the patient's self-efficacy [54]. In sum, the processes of change are considered as mediators between stage movements or as predictors of stages [54,80], whereas the markers of change - self-efficacy and decisional balance - are considered as dependent variables or sometimes as mediators [54,80].

Objectives and hypotheses of the current study

1) **Validating the five TTM stages:** It will be tested whether the five stages of change can be empirically validated regarding the patient's motivation for changing psychiatric problems in outpatient treatment. Specifically, it will be tested if:

a. the experiential and behavioural processes of change, self-efficacy and decisional balance discriminate between the identified stages in the manner hypothesized by TTM. We hypothesized that the stages could be distinguished in the manner consistent with original theory [54], as shown in Figure 1:

1. experiential processes of change are predictive of the precontemplation and contemplation stages, including stronger positive association with contemplation compared to precontemplation. Experiential processes are not predictive of the action and maintenance stages, or at least show less strong positive association with these stages compared to the behavioural processes;
2. behavioural processes of change are predictive of the action and maintenance stages, showing positive associations with both stages. Behavioural processes are not predictive of the precontemplation and contemplation stages, or at least show less strong positive association with these stages compared to the experiential processes;
3. the decisional balance variables problem recognition, distress and perceived suitability of treatment will be negatively associated with precontemplation, and will show increasingly positive associations with contemplation, action and maintenance;
4. the decisional balance variables perceived external pressure and costs of treatment will be positively associated with precontemplation, and will show increasingly negative associations with contemplation, action and maintenance;
5. self-efficacy will be negatively associated with precontemplation, and will show increasingly positive associations with contemplation, action and maintenance.

b. the stages show associations with treatment engagement. Consistent with TTM [54], we hypothesized that precontemplation would show negative association with treatment engagement, whereas the 'higher' stages would all show increasingly stronger positive associations with treatment engagement.

2) **Testing the stability of the relations between stages and outcomes:** we hypothesized that the associations between stages and clinical outcomes would be stable across time and across patient groups, as this would provide support for the robustness of the stage construct.

3) **Testing differences in stability and predictive power between two types of stage assessments:** it will be investigated whether there are differences between the staging algorithm and continuous assessment regarding their stability across time and patient groups and their abilities to explain variance in treatment engagement. It was hypothesized that the strength of associations would vary between the two types of assessment, but that the pattern of associations and stability across times and groups would be similar.

Methods

Study Design

The current longitudinal observational study (baseline assessment and one-year follow-up) constitutes a secondary analysis of a cluster randomized clinical trial[197]. The design of this trial and the intention-to-treat analyses were reported elsewhere [197]. The study was approved by the Medical Ethical Committee for Mental Health Care Institutions (Dutch Trial Registry NTR2968) as well as by the scientific committees of the two specialty mental health institutions where the data were collected. Findings are reported according to the STROBE guidelines [226].

Setting

Data were collected between May 2011 and October 2013 from 12 outpatient treatment programs,

including a forensic psychiatric outpatient clinic, three specialized psychotic outpatient treatment programs and eight several function-assertive community treatment teams (FACT-teams[14]) of two Dutch treatment centers: the Western North Brabant Mental Health Center and the Breburg Mental Health Center. FACT-teams provide assertive, outreaching, community-based, and supportive psychiatric services to individuals with SMI [14], such as those with psychotic disorders and severe personality disorders.

Participants and procedures

All of the following inclusion criteria for patients had to be fulfilled: a primary diagnosis of psychotic or personality disorder, aged 18 to 65 years, undergoing individual outpatient treatment and having a sufficient command of the Dutch language. A clinician was eligible for participation if he or she was the primary health care provider involved with the patient and saw the patient most frequently. Eligible patients on the clinicians' caseload lists were approached and informed by researchers and asked for their signed consent. Both patients and clinicians were asked to fill in questionnaires at baseline and follow-up assessment (12 months after baseline) and additionally, patients were interviewed regarding their functioning in several life domains by independent research assistants at these assessment moments. To enhance the likelihood of participation, patients were given an incentive of 15 euro for the baseline and follow-up assessment in the trial.

Measures

Core theoretical constructs of TTM: stages of change, decisional balance, self-efficacy and processes of change

The stages of change were measured by using the University of Rhode Island Change Assessment (URICA)[38,170] and with a staging algorithm. The URICA-D is the Dutch version of the URICA [38,170], which is a self-report scale consisting of 24 items which are rated on a scale from 1 (totally disagree) to 5 (totally agree) that correspond to one of four stages: precontemplation (P), contemplation (C), action (A) or maintenance (M). The version used in the present study employs the generic 'problem' frame for the items, which has allowed the URICA to be used with a variety of disorders and behaviours[54,62,63], by instructing the patients that 'for all statements that refer to your "problem", answer in terms of the most important problem that you are working on in your current treatment'. In the current study, most patients wrote target goals such as 'reach stability in psychotic symptoms' or 'prevent relapse in psychoses'. As all patients in our study sample were enrolled in treatment, we considered that we could generalize the responses to the URICA-D as representing 'willingness to change psychiatric problems during outpatient treatment'. Example items of the URICA-D are 'As far as I'm concerned, I don't have any problems that need changing' (P), 'I have a problem and I really think I should work on it' (C), 'I am doing something about the problems that had been bothering me' (A) and 'It worries me that I might slip back to a problem I have already changed, so I am here to seek help' (M). Subscale scores were calculated based on their original item composition [170]. Congeneric estimates of reliability in the current sample were: 0.50 (P), 0.67 (C), 0.84 (A) and 0.68 (M).

The algorithm approach involves several questions that ask about attempts and intentions to change behaviour within certain time frames corresponding to a particular stage. Patients were asked to indicate whether they were currently in the precontemplation, contemplation, preparation, action or maintenance stage with regard to their motivation to change psychiatric problems. That is, this is a 'forced-choice' assessment; patients can choose only one stage to be in regarding their motivation for changing their psychiatric problems. Precontemplation was defined as 'not planning to work on my problems in the next six months'. Contemplation was defined as 'planning to work on my problems within the next six months, but not within 30 days from now'. Preparation was defined as 'planning to work actively on my problems within the next 30 days'. Action was defined as 'having worked on my problems actively for the last 30 days, but no longer than six months'. Maintenance was defined as 'having worked actively on my problems for the last six months'. These definitions are similar to standard stage algorithms from TTM [80,83,96].

To assess the processes of change, we developed a Dutch questionnaire which was based on available short questionnaires for the processes of change [96,171,172], but adapted to fit its application to change processes in psychiatric treatment. The processes of change were measured by asking patients to indicate how often they made use of the strategies described in 20 statements [197], reported in the supplementary material (Table S1). The statements were rated on a five point Likert scale, ranging from 1 (never) to 5 (repeatedly), consistent with other short measures of the processes of change [57,96,171,172]. The overarching constructs of experiential and behavioural processes of change were used for the current study, of which the congeneric estimates of reliability were 0.71 and 0.77, respectively. Additional psychometric

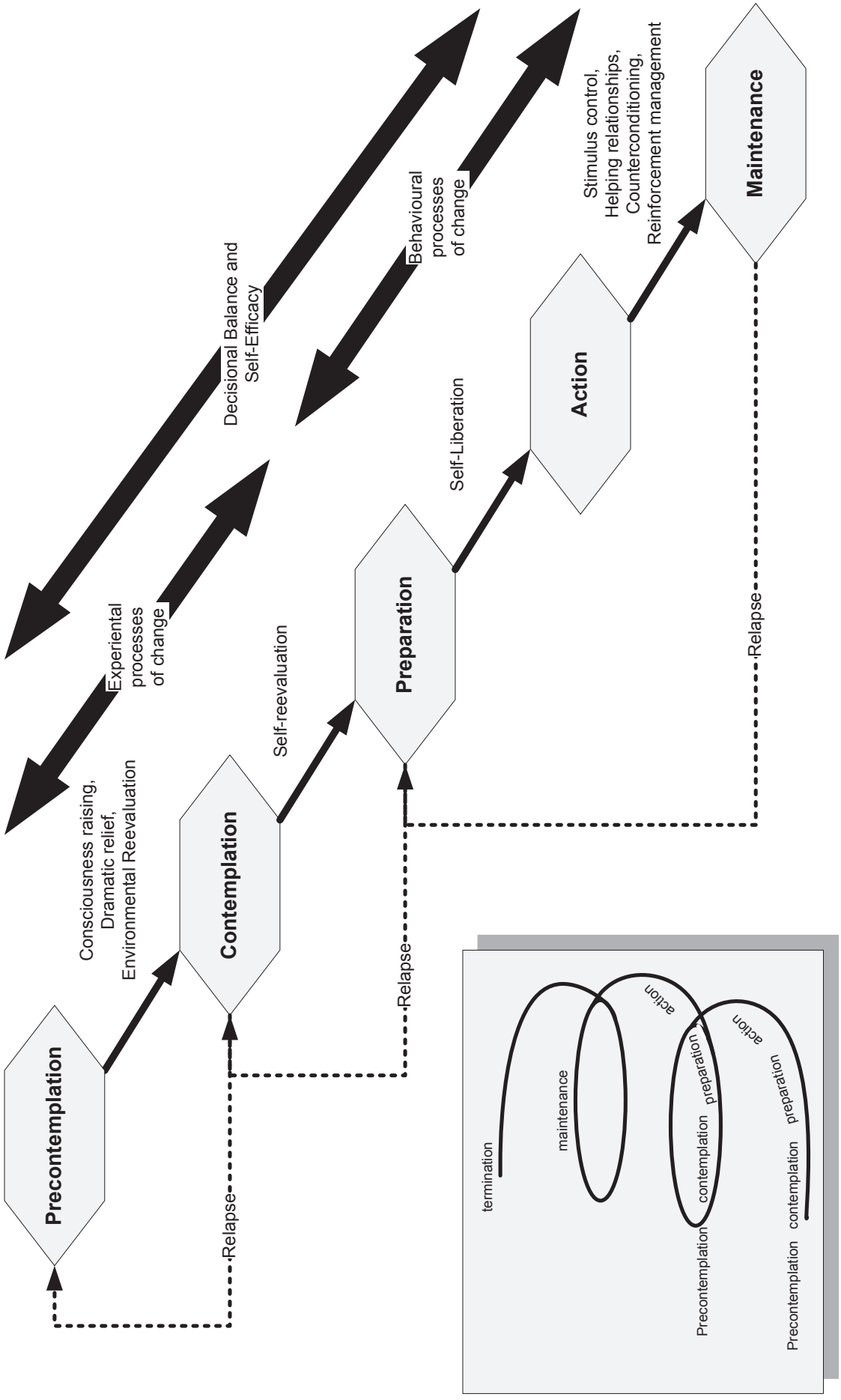
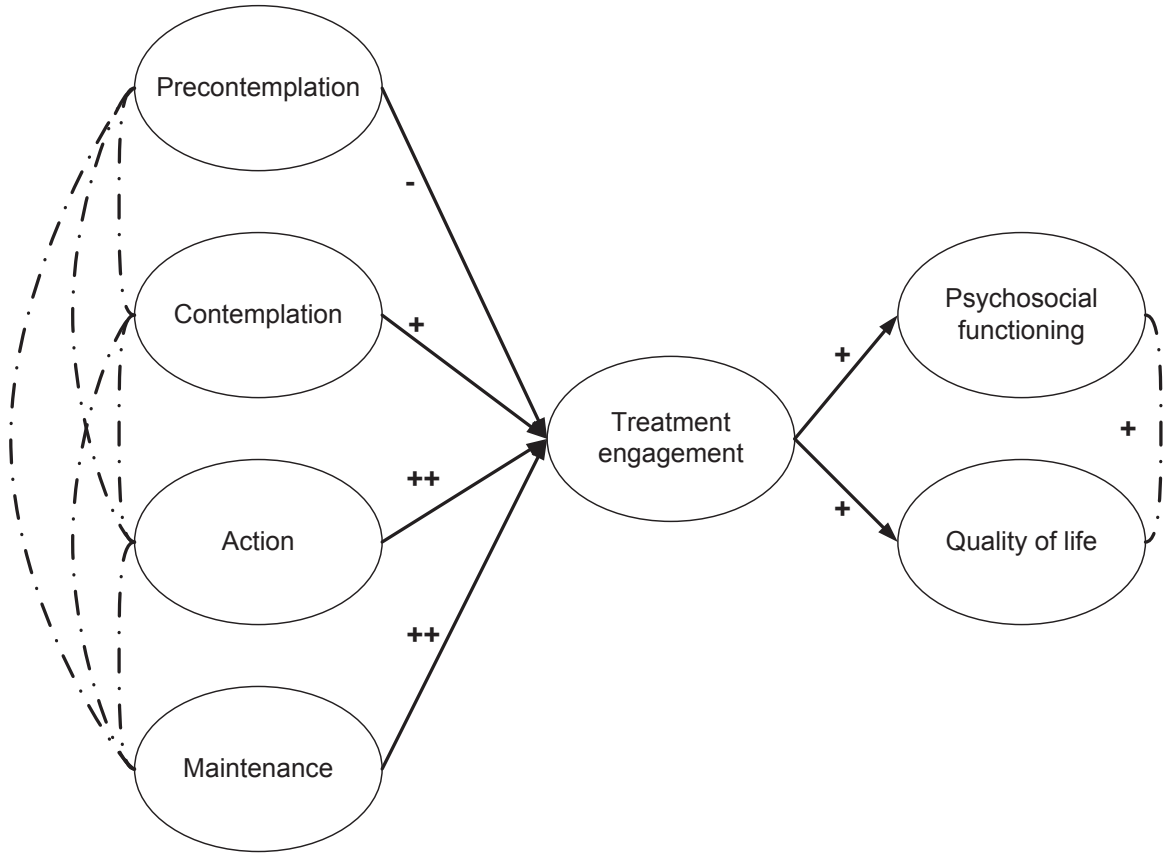


Figure 1: The TransTheoretical Model, adapted from [44] and [84], showing its cyclical nature and the processes related to stage movement

Figure 2. Hypothesized model for the associations between stages of change and clinical outcomes in the current study



Note: It was hypothesized that precontemplation would show negative association with treatment engagement, whereas the other 'higher' stages would show positive and increasingly stronger associations with treatment engagement compared to lower stages, consistent with original theory [3]. Thick lines represent theoretically expected regression paths, dotted lines represent expected intercorrelations of variables.

properties of this questionnaire are reported in the supplementary material (Table S1).

Decisional balance and self-efficacy were assessed using the Treatment Motivation Scale for forensic patients (TMS-f) [118]. The original TMS-f consists of eight Dutch subscales, of which six were considered relevant for the current study: problem recognition, distress, perceived external pressure, perceived costs of treatment, perceived suitability of treatment and outcome expectancy. It was considered that patients who are enrolled in treatment will evaluate these factors as either high or low and that these evaluations can be translated into either a pro or a con for treatment. For example, a patient who perceives the treatment as highly suitable is likely to consider this a pro for treatment, whereas high costs in terms of having to invest time, energy and recourses in the treatment can be considered as a con for engaging in treatment. Example items include: 'I have to learn to deal with certain situations in a better way, to prevent things going wrong again' (problem recognition), 'My life sucks' (distress), 'I feel a strong pressure from others to deal with my problems' (perceived external pressure), 'If you consider the time, money and energy that I have to invest in treatment, then it comes at a high cost' (perceived costs of treatment) and 'I totally agree with the goals of this treatment' (perceived suitability of treatment). The subscale for outcome expectancy was used as a measure for self-efficacy, as this scale addresses the patient's expectancy that he/she will be able to do what the treatment requires and to finish it [118]. This is consistent with the definition of self-efficacy within TTM, namely "the situation-specific confidence that people can cope with (high-risk) situations without relapsing to their former behaviours"(p. 102) [54]. All items of the TMS-f were rated on a 5-point Likert scale (0 = totally agree to 5 = totally disagree). The subscale scores were calculated in such a way

that a higher score on the subscale represented more perception of that respective scale, including the subscale perceived costs of the treatment (i.e. higher scores represented higher perceived costs of the treatment). Congeneric estimates of reliability for the six subscales of the TMS-f ranged from 0.61 to 0.91 in the current sample.

Clinical outcomes: Treatment engagement, psychosocial functioning and quality of life

Treatment engagement was measured with the Service Engagement Scale (SES) that was filled out by clinicians. The SES was developed to measure engagement with community mental health services [199]. It comprises 14 items that assess availability, collaboration, help seeking and treatment engagement behaviours (including medication adherence). The items are rated on a 4-point scale ranging from 0 (not at all) to 3 (most of the time). The SES has good internal consistency; the congeneric estimate of reliability was 0.91 in the current sample. Its validity is supported by discrimination between criterion groups [199] and statistically significant associations with therapeutic alliance and motivation for engaging in treatment [218]. The SES total scale score was used as the outcome measure in this study, where higher scores denote higher treatment engagement.

The patient's psychosocial functioning was measured with the Dutch version of the Health of the Nations Outcome Scales (HoNOS)[163,164]. The HoNOS is a semi-structured interview with the patient in which health and social problems of the previous two weeks are quantified. It contains 12 items that refer to behavioural problems, cognitive and physical impairments, symptoms, and social (dis)functioning. HoNOS items are scored on a scale from 0 (no problem) to 4 (severe problem) . The total scale score is computed by adding the 12 items. For ease of interpretation, we recoded the total score such that higher scores reflected better psychosocial functioning. The administration of the HoNOS was performed by independent research assistants (mostly graduate students in psychology and medicine) who had no involvement in the patient's treatment. Patients were interviewed at the team office or at home, depending on their preference. Internal consistency was acceptable in the current study; congeneric estimate of reliability = 0.77. The psychometric properties of the total scale score were shown to be acceptable and sensitive to change in previous studies [164,233].

The patient's quality of life was assessed with the Dutch version of the Manchester Short Assessment of Quality of Life (MANSA)[167,168]. The MANSA is a self-report questionnaire that asks the patient how satisfied he/she is in the following life domains: living situation, social relationships, physical health, mental health, safety, financial situation, work situation and life as a whole. The 12 items are scored on a Likert scale from 1 (couldn't be worse) to 7 (couldn't be better), which are summed to calculate a total score. Higher scores denote a higher perceived quality of life. The congeneric estimate of reliability was 0.92 in the current sample. Other psychometric properties of the MANSA are considered satisfactory[167].

Statistical analyses

Structural equation modelling (SEM) as implemented in Mplus version 7.3 [202] was used to investigate the research questions. As the type of design was complex (patients clustered within teams) and, in addition, the distributions of the variables were considered to be non-normal, the estimation method used was MLR. This maximum likelihood estimates standard errors and $\chi 2$ test statistics that are robust to non-normality and non-independence of observations. Additionally, the variable 'team' was included as a second level in the analyses to adjust for potential clustering of the data within treatment teams.

To evaluate the validity of the stages of change, two models were tested. In Model 1, the stages of change as assessed with the staging algorithm were included as predictors for the URICA-D stages to investigate the associations between the two assessment methods, to address convergent validity. In Model 2, the experiential and behavioural processes of change, self-efficacy and the trichotomized decisional balance variables were used as predictors for the stages of change (both the URICA-D and algorithm), to address criterion validity. The decisional balance and self-efficacy variables were trichotomized to investigate non-linear relationships between these variables and the stages of change, which was feasible, mirrors clinical practice and eases the interpretation of results. Spearman correlations and analyses of variance were conducted to examine the relationships between stages of change and mean scores on the patient's treatment engagement, psychosocial functioning and quality of life.

Subsequently, we evaluated the empirical-statistical plausibility of the model as outlined in Figure 2 at baseline and at follow-up, as well as across patient diagnostic groups. This was done separately but similar for both the staging algorithm and the URICA-D. To make the structural models for the staging algorithm and URICA-D comparable, the stages contemplation and preparation were merged to one stage (labelled 'contemplation') in the staging

Table 1. Baseline characteristics of participating patients, stratified by primary diagnosis

	Total patient sample n = 294	Psychotic disorders n= 199	Personality disorders n = 95
Age, mean (SD)	44 (10.3)	43 (10.3)	45 (10.0)
Male gender, n (%)	179 (60.9)	132 (66.3)	47 (49.5)
Dutch ethnicity[A], n (%)	208 (70.7)	140 (70.4)	68 (71.6)
Education level, n (%)			
- No education/elementary	108 (36.7)	76 (38.2)	32 (33.7)
- Secondary school	124 (42.2)	75 (37.7)	49 (51.6)
- Upper high school and over	59 (20.1)	47 (23.6)	12 (12.6)
Comorbid substance use problems[B], n (% yes)	74 (25.2)	42 (21.1)	32 (33.7)
Legal mandate, n (% yes)	24 (6.9)	13 (6.5)	11 (12.0)
One or more previous admissions, n, (% yes)	227 (77.2)	159 (79.9)	68 (71.6)
Stages of change algorithm, n (%)			
- Precontemplation	10 (3.5)	8 (4.2)	2 (2.2)
- Contemplation	2 (0.7)	1 (0.5)	1 (1.1)
- Preparation	10 (3.5)	6 (3.2)	4 (4.3)
- Action	26 (9.2)	20 (10.6)	6 (6.5)
- Maintenance	234 (83.0)	154 (81.5)	80 (86.0)
URICA, mean (SD)			
- Precontemplation	2.6 (0.7)	2.6 (0.7)	2.4 (0.7)
- Contemplation	3.7 (1.0)	3.5 (1.1)	4.0 (0.9)
- Action	4.0 (0.8)	3.9 (0.8)	4.1 (0.7)
- Maintenance	3.7 (0.8)	3.6 (0.9)	3.9 (0.7)
Treatment engagement, median (IQR)	31 (24 to 36)	32 (25 to 37)	28 (24 to 35)
Psychosocial functioning, median (IQR)	9 (6 to 13)	8 (5 to 12)	10 (8 to 15)
Quality of life, median (IQR)	5 (4 to 5)	5 (4 to 5)	4 (4 to 5)

Numbers may not sum to total due to missing data.

[A] The definition of Dutch Ethnicity was based on the definition by the Dutch Bureau of Statistics[234].

[B] Substance abuse problem was defined as having a DSM-IV diagnosis of substance abuse and/or dependence in the medical record.

algorithm, such that both assessment methods represented the four stages precontemplation, contemplation, action and maintenance. An extensive description of the model testing using SEM, including the criteria used to evaluate model fit and the procedure for comparisons between models, can be found in the supplementary material online. Standardized regression coefficients (β) and corresponding standard errors (S.E.) as well as p-values (two-sided) are reported.

Results

Participants and descriptive data

A total of 294 patients and 57 clinicians were included between May 2011 and September 2012. Patient characteristics are shown in Table 1. The majority of patients with psychotic disorders were diagnosed with schizophrenia (48%), schizoaffective disorder (16%), or psychotic disorder not otherwise specified (24%). In the group with primarily personality disorders, 40% had a borderline personality disorder, 13% had antisocial personality disorder, and 26% had a personality disorder not otherwise specified. Most clinicians were female (63%), their mean age was 44 years (SD = 10.70) and they had a mean of 16 years of clinical working experience in mental health services (SD =9.30).

After 12 months, 253 patients (86%) were re-assessed. The group that was lost to follow-up was significantly more often of non-Dutch ethnicity (48% versus 26%, p<0.01) and more often had a legal mandate for treatment (18% versus 7%, p = 0.03) compared to completers.

It can be seen in Table 1 that, in accordance with expectations, the large majority of patients considered themselves to be in maintenance stage (83%) as assessed with the staging algorithm. Table S2 in the supplementary material shows correlations between the stages of change as assessed with the URICA-D, processes of change and clinical outcomes, at two time points.

Associations between the stages of change and other TTM constructs

Model 1 in Tables 2a and 2b shows the associations between the staging algorithm and the URICA-D for baseline and follow-up assessments, respectively. The algorithm and URICA-D showed low concordance for both time points (e.g. contemplation scales for both instruments: β = 0.07, p = 0.38). As there is no

Table 2a. Identification of the stages of change at baseline assessment

Model 1	**Precontemplation URICA-D**		**Contemplation URICA-D**		**Action URICA-D**		**Maintenance URICA-D**	
	β (S.E.)	p-value	β (S.E.)	p-value	β (S.E.)	p-value	β (S.E.)	p-value
Stages algorithm								
PRE	-0.19 (0.12)	0.13	-0.02 (0.09)	0.81	0.01 (0.08)	0.92	-0.07 (0.11)	0.55
CON	**-0.19 (0.08)**	**0.02**	0.07 (0.08)	0.38	0.02 (0.05)	0.74	-0.01 (0.05)	0.92
PREP	-0.13 (0.11)	0.20	**0.29 (0.10)**	**<0.01**	-0.04 (0.08)	0.58	0.06 (0.13)	0.64
ACT	**-0.42 (0.18)**	**0.02**	**0.29 (0.11)**	**<0.01**	-0.02 (0.14)	0.86	0.05 (0.18)	0.80
MAIN	**-0.50 (0.23)**	**0.03**	**0.43 (0.12)**	**<0.01**	0.11 (0.20)	0.59	0.10 (0.19)	0.62
Model 2	**Precontemplation URICA-D & algorithm**		**Contemplation URICA-D & algorithm**		**Action URICA-D & algorithm**		**Maintenance URICA-D & algorithm**	
	β (S.E.)	p-value	β (S.E.)	p-value	β (S.E.)	p-value	β (S.E.)	p-value
Exp proc	-0.03 (0.15) & -0.09 (0.14)	0.82 &0.49	**0.13 (0.07) & 0.16 (0.08)**	**0.05 & 0.03**	0.08 (0.08) & 0.02 (0.04)	0.28 & 0.63	0.10 (0.09) & -0.14 (0.07)	0.25 & **0.04**
Beh proc	0.03 (0.10) & 0.11 (0.08)	0.74 &0.15	**0.26 (0.09)** & 0.03 (0.05)	**<0.01** &0.48	**0.23 (0.07)** & 0.09 (0.08)	**<0.01**&0.24	**0.17 (0.06)** & -0.05 (0.08)	**<0.01** & 0.54
Problem rec								
- Middle	**-0.17 (0.07)& -0.17 (0.05)**	**0.02 &0.01**	**0.43 (0.07)** & 0.08 (0.07)	**<0.01** &0.24	0.05 (0.07) & -0.06 (0.05)	0.48 & 0.30	**0.30 (0.07) & 0.15 (0.06)**	**<0.01 & 0.01**
- High	-0.13 (0.08) & -0.12 (0.07)	0.09 &0.09	**0.53 (0.09) & 0.15 (0.06)**	**<0.01&0.01**	**0.15 (0.08)** & -0.05 (0.08)	**0.05** & 0.49	**0.37 (0.08)** & 0.05 (0.09)	**<0.01** & 0.61
Distress								
- Middle	-0.02 (0.04) & 0.03 (0.08)	0.64 &0.75	**0.18 (0.06)** & -0.03 (0.06)	**<0.01** &0.61	0.02 (0.06) & -0.04 (0.08)	0.78 & 0.59	**0.26 (0.06)** & 0.07 (0.06)	**<0.01** & 0.20
- High	**-0.26 (0.09)** & -0.04 (0.03)	**<0.01** &0.12	**0.18 (0.07)** & -0.07 (0.09)	**<0.01** &0.43	0.03 (0.08) & 0.06 (0.09)	0.74 & 0.50	**0.18 (0.07)** & 0.04 (0.07)	**<0.01** & 0.56
Ext pressure								
- Middle	-0.11 (0.09) & 0.04 (0.07)	0.26 &0.52	**-0.16 (0.07)** & -0.04 (0.07)	**0.03** & 0.60	-0.03 (0.05) & -0.05 (0.05)	0.63 & 0.34	0.04 (0.07) & 0.08 (0.07)	0.61 & 0.20
- High	-0.12 (0.12) & 0.10 (0.08)	0.30 &0.19	-0.02 (0.08) & **-0.17 (0.08)**	0.85 & **0.02**	0.07 (0.05) & -0.04 (0.09)	0.18 & 0.68	**0.17 (0.07)** & 0.09 (0.12)	**0.01** & 0.43
Costs treat								
- Middle	0.10 (0.08) & -0.04 (0.06)	0.20 &0.50	-0.00 (0.06) & -0.05 (0.06)	0.95 & 0.43	0.04 (0.06) & 0.08 (0.07)	0.52 & 0.28	-0.04 (0.06) & 0.03 (0.07)	0.54 & 0.62
- High	0.03 (0.04) & 0.23 (0.15)	0.47 &0.13	-0.00 (0.05) & **-0.06 (0.02)**	0.96 &**<0.01**	**0.09 (0.04) & -0.03 (0.01)**	**0.04 & 0.01**	-0.02 (0.04) & -0.01 (0.07)	0.58 & 0.87
Suitab treat								
- Middle	0.10 (0.10) & -0.09 (0.13)	0.34 &0.51	0.08 (0.08) & -0.14 (0.08)	0.32 &0.08	**0.16 (0.07)** & 0.09 (0.07)	**0.03** & 0.19	0.05 (0.07) & 0.12 (0.07)	0.51 & 0.07
- High	**0.19 (0.06)** & -0.13 (0.11)	**<0.01** &0.26	0.03 (0.08) & **-0.25 (0.08)**	0.71 &**0.01**	**0.23 (0.08)** & 0.05 (0.10)	**<0.01**&0.62	0.08 (0.09) & **0.21 (0.08)**	0.36 & **0.01**
Self-efficacy								
- Middle	-0.11 (0.09) & -0.09 (0.11)	0.23 &0.38	-0.03 (0.08) & -0.01 (0.11)	0.73 & 0.94	0.04 (0.09) & **0.12 (0.05)**	0.65 & **0.02**	-0.11 (0.10) & 0.01 (0.06)	0.25 & 0.89
- High	**-0.37 (0.12)** & -0.08 (0.09)	**<0.01** &0.35	-0.11 (0.08) & 0.05 (0.16)	0.16 & 0.73	**0.24 (0.10)** & -0.04 (0.05)	**0.02** & 0.35	-0.18 (0.14) & 0.09 (0.07)	0.20 & 0.25

β = standardized regression coefficient. S.E. = standard error of standardized regression coefficient. PRE = precontemplation, CON = contemplation, ACT = action, MAIN = maintenance, Exp proc = experiential processes, Beh proc = behavioural processes, Problem rec = problem recognition, Ext pressure = external pressure, Costs treat = perceived costs of treatment, Suitab treat = perceived suitability of treatment. Boldface indicates p<0.05.

preparation scale on the URICA-D, it could be argued that this might influence the results. To address such concerns, we combined the preparation stage with the contemplation stage in the staging algorithm such that both assessment methods had four comparable stages and reran the analyses. This procedure resulted in similar results (not shown).

Model 2 in Tables 2a and 2b shows the associations of stages of change (URICA-D and the algorithm) with the processes of change, decisional balance and self-efficacy. The URICA-D and algorithm did not show a similar pattern regarding associations with predictor variables, and the patterns were not similar for the two time points. Regarding the processes of change, only partial support was found for the theoretically expected associations with the stages. For example, the precontemplation stage showed no statistically significant associations with the processes, except for the algorithm at follow-up which showed negative associations with both the experiential and behavioural processes of change. Further, at baseline assessment, the URICA-D action and maintenance stages showed statistically significant associations with behavioural processes and non-significant associations with experiential processes, consistent with theory. However, this pattern was not seen for the algorithm nor for the follow-up assessment which showed mixed findings regarding the action and maintenance stages and the experiential and behavioural processes.

Similarly, regarding the associations with decisional balance variables, a differential pattern across stages emerged and not all associations were in line with theoretical expectations. For example, perceiving the treatment as highly suitable would correspond to a 'pro' for engaging with treatment, such that positive and significant associations with the action and maintenance stages would be expected. This is partly supported by our data as

Table 2b. Identification of the stages of change at follow-up assessment

Model 1	Precontemplation URICA-D		Contemplation URICA-D		Action URICA-D		Maintenance URICA-D	
	β (S.E.)	p-value	β (S.E.)	p-value	β (S.E.)	p-value	β (S.E.)	p-value
Stages algorithm								
PRE	0.01 (0.09)	0.91	-0.11 (0.12)	0.33	-0.09 (0.08)	0.27	-0.07 (0.09)	0.42
CON	-0.13 (0.08)	0.08	**0.20 (0.09)**	**0.03**	-0.09 (0.07)	0.19	0.13 (0.07)	0.06
PREP	-0.15 (0.10)	0.12	**0.22 (0.08)**	**<0.01**	-0.03 (0.08)	0.74	**0.31 (0.08)**	**<0.01**
ACT	**-0.40 (0.18)**	**0.03**	**0.50 (0.17)**	**<0.01**	0.15 (0.15)	0.33	**0.51 (0.13)**	**<0.01**
MAIN	-0.16 (0.19)	0.40	0.34 (0.20)	0.09	0.26 (0.17)	0.12	**0.38 (0.16)**	**0.02**
Model 2	**Precontemplation URICA-D & algorithm**		**Contemplation URICA-D & algorithm**		**Action URICA-D & algorithm**		**Maintenance URICA-D & algorithm**	
	β (S.E.)	p-value	β (S.E.)	p-value	β (S.E.)	p-value	β (S.E.)	p-value
Exp proc	-0.17 (0.11) & -0.14 (0.06)	0.14 & **0.03**	**0.60 (0.07)** & 0.04 (0.06)	**<0.01** & 0.53	0.05 (0.07) **& 0.22 (0.08)**	0.47 & **0.01**	**0.48 (0.09)** & -0.12 (0.07)	**<0.01** & 0.07
Beh proc	0.05 (0.08) & -0.10 (0.04)	0.82 & **0.02**	0.05 (0.08) & -0.03 (0.07)	0.50 & 0.71	**0.44 (0.06) & -0.15 (0.04)**	**0.00&<0.01**	0.06 (0.11) & **0.27 (0.09)**	0.58 &**<0.01**
Problem rec								
- Middle	-0.11 (0.23) & -0.04 (0.07)	0.39 & 0.53	**0.28 (0.07)** & 0.07 (0.07)	**<0.01** & 0.36	0.05 (0.03) & 0.06 (0.07)	0.12 & 0.41	**0.14 (0.07)** & 0.03 (0.05)	**0.03** & 0.53
- High	**-0.22 (0.09)** & 0.04 (0.08)	**0.01** & 0.62	**0.32 (0.07)** & 0.06 (0.08)	**<0.01** & 0.46	0.16 (0.13) & **0.17 (0.08)**	0.23 & **0.03**	**0.31 (0.08) & -0.18 (0.07)**	**<0.01 & 0.01**
Distress								
- Middle	**-0.23 (0.08)** & 0.09 (0.06)	**<0.01** & 0.12	0.09 (0.07) & -0.04 (0.06)	0.16 & 0.51	0.16 (0.08) & -0.04 (0.03)	0.05 & 0.19	**0.12 (0.04)** & 0.06 (0.06)	**<0.01** & 0.33
- High	**-0.42 (0.11)** & 0.04 (0.06)	**<0.01** & 0.45	**0.14 (0.05)** & 0.15 (0.08)	**0.01** & 0.06	0.02 (0.08) & 0.02 (0.09)	0.77 & 0.87	0.03 (0.09) & 0.03 (0.06)	0.78 & 0.62
Ext pressure								
- Middle	0.01 (0.09) & **-0.16 (0.06)**	0.96 & **0.01**	-0.06 (0.11) & 0.03 (0.08)	0.60 & 0.71	0.01 (0.08) & -0.01 (0.04)	0.86 & 0.90	0.06 (0.09) & 0.05 (0.07)	0.54 & 0.51
- High	-0.10 (0.08) & **-0.14 (0.04)**	0.23 & **<0.01**	0.05 (0.07) & 0.11 (0.10)	0.48 & 0.26	-0.04 (0.07) & 0.08 (0.08)	0.60 & 0.32	**0.15 (0.06)** & -0.04 (0.08)	**0.01** & 0.62
Costs treat								
- Middle	0.00 (0.07) & 0.04 (0.06)	0.98 & 0.46	**-0.17 (0.07)** & 0.05 (0.09)	**0.01** & 0.57	-0.12 (0.06) & -0.17 (0.05)	0.07&**<0.01**	**-0.15 (0.05)** & 0.10 (0.07)	**<0.01** & 0.17
- High	-0.07 (0.08) & -0.01 (0.01)	0.34 & 0.37	0.04 (0.06) & 0.07 (0.13)	0.51 & 0.57	0.03 (0.03) & -0.10 (0.03)	0.36&**<0.01**	**0.07 (0.03)** & -0.07 (0.05)	**0.04** & 0.16
Suitab treat								
- Middle	0.05 (0.10) & -0.09 (0.10)	0.60 & 0.38	-0.12 (0.07) & **-0.33 (0.11)**	0.10 & **<0.01**	0.02 (0.08) & -0.08 (0.10)	0.76 & 0.46	-0.12 (0.07) & **0.24 (0.10)**	0.09 & **0.01**
- High	0.08 (0.14) & -0.03 (0.10)	0.54 & 0.77	-0.07 (0.14) & **-0.35 (0.14)**	0.63 & **0.02**	0.04 (0.12) & -0.10 (0.11)	0.76 & 0.24	-0.10 (0.12) & **0.21 (0.08)**	0.42 & **0.01**
Self-efficacy								
- Middle	**-0.26 (0.07)** & 0.10 (0.10)	**<0.01** & 0.33	0.10 (0.07) & 0.03 (0.04)	0.19 & 0.42	0.05 (0.07) & -0.10 (0.11)	0.47 & 0.37	0.02 (0.08) & 0.00 (0.08)	0.77 & 0.99
- High	**-0.46 (0.12)** & 0.03 (0.09)	**<0.01** & 0.76	0.10 (0.12) & 0.05 (0.08)	0.44 & 0.53	**0.25 (0.06)** & -0.09 (0.11)	**<0.01**&0.39	0.05 (0.14) & 0.07 (0.10)	0.70 & 0.48

β = standardized regression coefficient. S.E. = standard error of standardized regression coefficient. PRE = precontemplation, CON = contemplation, ACT = action, MAIN = maintenance, Exp proc = experiential processes, Beh proc = behavioural processes, Problem rec = problem recognition, Ext pressure = external pressure, Costs treat = perceived costs of treatment, Suitab treat = perceived suitability of treatment. Boldface indicates p<0.05.

demonstrated by the significant positive associations with the URICA-D action scale at baseline and the algorithm maintenance scale at follow-up. However, the significant positive association between high suitability of treatment and the URICA-D precontemplation at follow-up, as well as the non-significant associations for the URICA-D action and maintenance with suitability of treatment at follow-up, were not in line with theoretical expectations. Also, the patient's self-reported problem recognition showed negative associations with URICA-D precontemplation and positive associations with URICA-D contemplation and maintenance stages, which was consistent with expectations, but this pattern was less evident for the algorithm.

High levels of self-reported treatment-related self-efficacy showed theoretically expected negative associations with URICA-D precontemplation and positive associations with URICA-D action at both time points, but not with the maintenance stages (as reflected by non-significant associations for both methods at both time points).

Associations between stages of change and clinical outcomes

Table S2 in the supplementary material shows Spearman correlations between the stages of change as assessed with the URICA-D and clinical outcomes, at two time points. In sum, it was found that the URICA-D action stage showed positive and statistically significant association with treatment engagement at all time points (ranging from r = 0.14 to r = 0.31), whereas the other stages showed mixed findings (e.g. maintenance was negatively associated with treatment engagement at baseline, but positively at follow-up). Analyses of variance were conducted to investigate relationships between the stages as assessed with the algorithm and all clinical outcomes, at two time points. Figure S1 in the supplementary material shows means for

all outcome variables across the stages of change at both timepoints. For the staging algorithm, it was found that patients in precontemplation showed statistically significantly lower treatment engagement at baseline compared to patients in maintenance (mean difference = 7.73, 95% CI = -15.03 to -0.43, p = 0.03), whereas no other stages were statistically different from each other at baseline and none of the stages showed statistically significant differences at follow-up regarding treatment engagement. Similarly, no statistically significant differences were found between the stages regarding psychosocial functioning and quality of life at baseline. At follow-up, theoretically unexpected differences were found between precontemplation and the higher stages, such that patients in precontemplation showed better psychosocial functioning compared to those in contemplation and action (mean difference = 8.66, 95%CI = 14.79 to 2.52, p<0.01 and mean difference = 6.34, 95%CI = 11.24 to 1.45, p<0.01, respectively). In line with theory, patients in the maintenance stage showed statistically significant higher quality of life at follow-up compared to patients in stages of contemplation (mean difference = 1.05, 95%CI = 0.27 to 1.82, p<0.01) and action (mean difference = 0.80, 95%CI = 0.35 to 1.26, p<0.01).

Subsequently, the hypothesized model as depicted in Figure 2 was fitted to the data at baseline and at follow-up, for both the staging algorithm and the URICA-D. The extensive results of the model fitting are presented in the supplemental material (Tables S3 and S4). Both for the staging algorithm and the URICA-D, the model in Figure 2 provided borderline fit to the data at both time points. Model fit improved somewhat when stages were regressed onto the previous stage, as shown in Figure 3. This model was therefore retained for further analyses. Despite the potential for further improvements of model fit, it was decided not to include additional paths between stages and clinical outcomes of psychosocial functioning and quality of life, as this was not in line with theory.

Testing the stability of the theoretical model across time and diagnostic groups

The model shown in Figure 3 was tested for stability across time and patient diagnostic groups (i.e. psychotic disorders and personality disorders), for both the staging algorithm and URICA-D, by testing the invariance of the paths in the model across the two measurement occasions. The extensive results of these model comparisons are presented in the supplemental material (see Table S4). For both the staging algorithm and the URICA-D, it was found that the models were invariant (i.e. not statistically significantly different) across time and across patient diagnostic groups at both time points.

Figure 3 shows the associations that were found between stages, treatment engagement and clinical outcomes for both the URICA-D and the staging algorithm for the two time points (using the model in which these paths were restricted to be equal for both time points). It can be seen that both the strength and direction of the associations between adjacent stages and between stages and treatment engagement were not similar for the two assessment methods. For example, the precontemplation stage of the algorithm showed no associations with contemplation and treatment engagement, whereas the URICA-D precontemplation showed statistically significant negative associations with these factors. Further, it can be seen that the staging algorithm shows negative associations between adjacent stages, whereas the URICA-D shows a negative association between precontemplation and contemplation but otherwise positive associations between adjacent stages. Finally, the associations between stages and treatment engagement were such that these were increasingly positive for higher stages in the staging algorithm, which was in line with theoretical expectations, whereas the URICA-D showed negative associations for precontemplation and contemplation and positive associations for action and maintenance with treatment engagement, which was not completely in line with theoretical expectations.

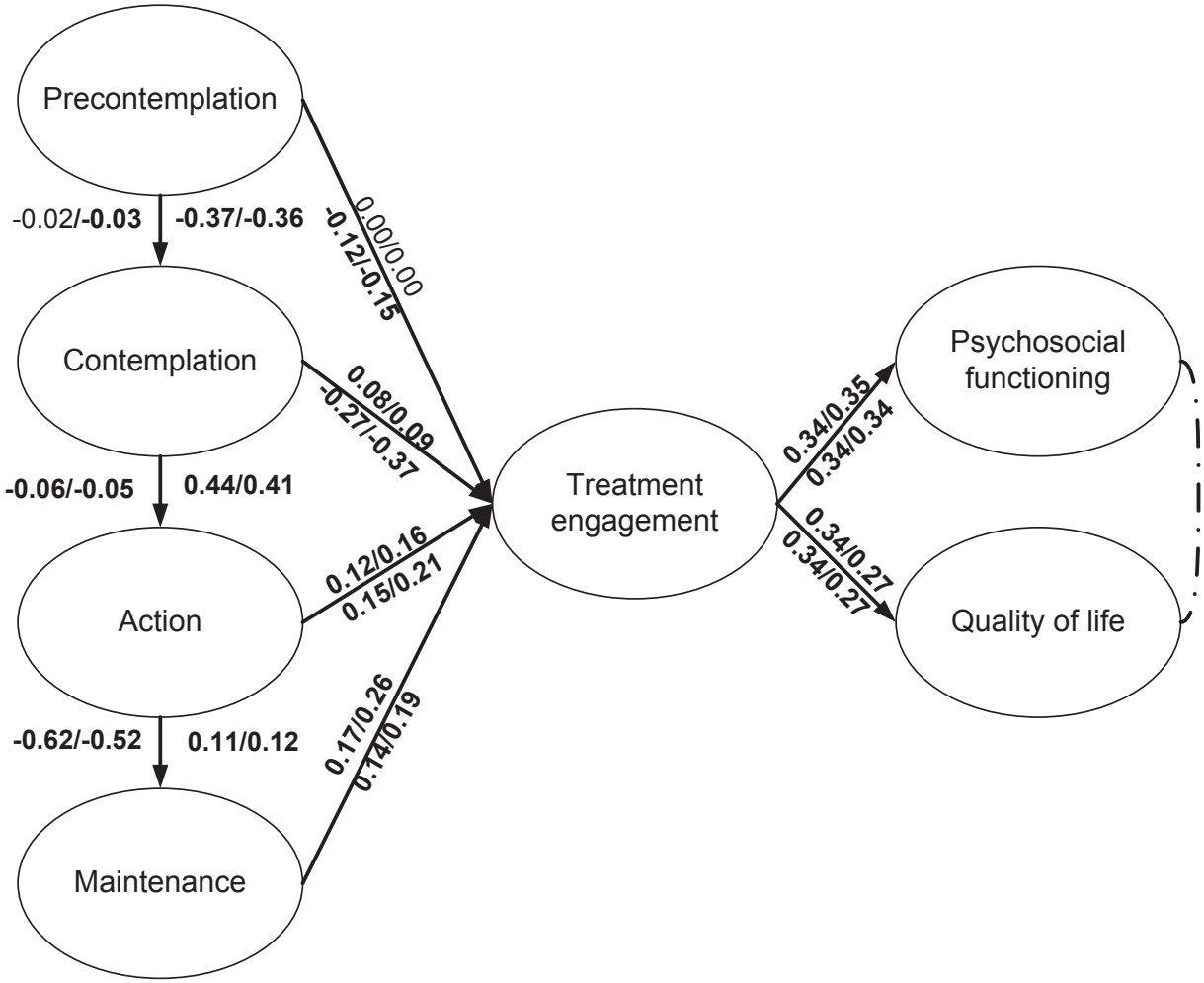
Variance explained by the models

It can be seen in Table 3 that the obtained process models for the staging algorithm explained around 7% of treatment engagement, while the URICA-D model explained between 6% to 16% of treatment engagement. Both methods of assessment explained between 8% to 17% of psychosocial functioning and between 5% to 15% of quality of life, depending on the timing of the assessment.

Discussion

The purpose of the current study was to investigate the validity of the TTM stages for motivation to participate in psychiatric treatment. Specifically, two popular methods of stage assessment, a staging algorithm and the URICA-D, were assessed for convergent and criterion validity using other TTM constructs and treatment engagement.

Figure 3. Testing the stages of change (using the staging algorithm and the URICA-D) across time on clinical outcomes of treatment engagement, psychosocial functioning and quality of life



Note: The figure represents Model 3b, with all regression coefficients restraint for the corresponding measurements at baseline and follow-up (i.e. indicating that these are invariant across time). Numbers represent standardized regression coefficients for the corresponding path (baseline / follow-up) for the staging algorithm (left of arrows and above the arrows) and for the URICA-D (right of arrows and below the arrows). For clarity, the correlations between the stages and between psychosocial functioning and quality of life are not shown.

Table 3. Variances explained by the stages of change in clinical outcomes

Model		Variance explained (R^2)		
		Treatment engagement	**Psychosocial functioning**	**Quality of life**
Staging algorithm	Baseline	0.07	**0.16**	**0.15**
	Follow-up	0.07	0.08	0.05
URICA-D	Baseline	0.06	**0.17**	**0.15**
	Follow-up	**0.16**	0.08	0.05

Boldface indicates p<0.05 (two-tailed).

Key findings and interpretation

It was found that the stages, as assessed by two standard TTM measures namely a staging algorithm and the URICA-D, only partially showed the theoretically expected associations with processes of change, decisional balance and self-efficacy. That is, the stages could neither be uniquely identified using the factors proposed by the authors of TTM, namely the processes and markers of change, nor with external factors such as treatment engagement behaviour. Findings were mixed regarding the associations between stages and clinical outcomes, for both assessment methods, such that the majority of the theoretically expected associations were not confirmed. Thus, these results point to problems in the applicability of staging measures to the engagement of patients with SMI in outpatient psychiatric treatment. These problems may be ascribed to the staging measures itself, to the population and/or study sample in which they were used, to the underlying theoretical model or a combination of these.

Regarding the measures it should be noted that, even though the current study did not set out to evaluate reliability of these two commonly used staging methods, there were reliability issues for the URICA-D. Only the action scale showed an acceptable level of internal consistency, whereas the other scales showed poor to questionable internal consistencies. An inspection of the item statistics and inter-item correlations did not reveal specific items that could be eliminated to improve consistency. Rather, inter-item correlations were generally in the low range overall, implying that the items within each subscale did not reflect the same underlying construct. It is plausible that the generic problem statement 'willingness to change psychiatric problems during outpatient treatment' was too broad, such that patients with different types of psychiatric problems and different treatments (e.g. with or without medication, additional supportive employment, volunteer work opportunities etc.) may have had different response tendencies, resulting in problems with internal consistency. This possibility should be investigated in future studies using more homogenous psychiatric patient groups who present with similar problems for which they receive similar treatments . Even so, it has previously been argued that the use of the stage construct in clinical practice for patients with SMI is problematic, as these patients typically present with multiple problems whereas the stage construct seems to require "that central, one and only, specifically identified problem" [113] (p. 54). The current study results seem to affirm these problems. Alternatively, studies using the URICA in other populations have shown higher internal consistencies, such as in patients in methadone maintenance treatment [232] and dually diagnosed patients [57,101], which may imply that the use of the URICA is more suited for treatment settings which specifically focus on addiction problems in psychiatric outpatients rather than the psychiatric problems itself. However, despite showing more acceptable internal consistencies in such populations, the URICA was found to have questionable external validity in those patient groups as well [101,232].

A limitation to the current study is that the study sample was largely representative of patients who were already well engaged with treatment services. This has impacted the range of scores on the URICA-D and the frequency distributions on the algorithm, such that we were likely limited in our ability to adequately model the earlier stages as numbers of patients were small. Nevertheless, it was expected that, in a population of patients who receive assertive outreaching psychiatric care, a distinction between patients in contemplation and those in maintenance should be possible (if these stages are indeed present and are a 'real' entity). However, the results suggest that – at least in so far as these stages are assessed with the algorithm or the URICA – the stages are difficult to distinguish from each other and therefore may not constitute clinically identifiable separate stages regarding readiness to engage with treatment. Minimally, this casts doubt on the potential utility of the stage construct from TTM as a framework for motivation for engaging with treatment considering that the processes, markers and outcomes that are supposed to be capable of distinguishing the stages do not do so. Acknowledging that the cross-sectional design of the current study is limited in its ability to identify stages from pseudo-stages or a (nonlinear) continuum model [77], the findings of the current study do not seem to support a stage theory.

Regarding the comparison between the algorithm and URICA-D, it was found that the algorithm and URICA-D showed low concordance and related differently to the processes and markers of change. These findings were contrary to theoretical expectations but consistent with previous TTM-literature [88,232], and suggests that the algorithm and URICA-D assess different aspects of motivation to engage with psychiatric treatment. Their use in research and clinical practice is therefore not interchangeable. Furthermore, although both assessment methods showed stable associations with treatment engagement and clinical outcomes over time and across different patient groups, they show limited predictive validity as shown by explained

variances of 6% to 16% in treatment engagement. Of the two methods tested in the current study, the algorithm showed the least and weakest theoretically expected associations with processes and markers of change and with treatment engagement. The results for the URICA-D were more in line with theoretical assumptions regarding associations with processes and markers of change, yet also provided limited explanatory power regarding treatment engagement behaviour.

Taken together, these findings reveal important problems in the applicability of staging measures to the engagement of patients with SMI in outpatient psychiatric treatment, and currently do not support their use for such purposes in clinical practice. This implies that there remains a need for reliable and valid instruments to assess the stages of change for engaging with psychiatric services. Such staging instruments should be (constructed and) evaluated in future studies, such that these can be a foundation for further research into the utility of the TTM in psychiatric treatment services. Until such reliable and valid assessments for the patient's stage of change for engaging with psychiatric services are available, essential questions regarding the potential utility of the TTM in this context cannot be adequately addressed.

Strengths and limitations

Strengths of the current study include the assessment of several central components of the TTM (i.e. stages, processes and markers of change) and the assessment of the stages by two methods, the correction for unreliability of measurements, a relatively large sample size considering the often difficult to engage SMI patient population, multiple centers in the study and the longitudinal component which allowed for testing at two time points. Further, the current study is novel in its approach of testing specific TTM hypotheses in a population of outpatients with SMI regarding their motivation for engaging with treatment services, and clinically relevant considering the widespread use and popularity of the model in clinical practice.

Besides the limitations mentioned previously, there are several others that deserve recognition. The correlational design provides limited ability to decide whether processes and markers of change are predictive of the stages of change and also whether the stage construct actually predicts treatment engagement behaviour. Nevertheless, correlational designs are usually considered as biasing the results towards overestimations of the accuracy of constructs within theories [77], whereas the current study found limited and weak support for the associations between constructs of the TTM, while using instruments that were context-specific and similar to standard questionnaires developed by the originators of the TTM. Further, although the current data provided a possibility to perform analyses on transitions in stages and to potentially evaluate the predictive validity of baseline stages on subsequent treatment engagement, it was chosen not to do so because it is plausible to argue that the long interval between stage assessments, 12 months, is not suitable for evaluating (frequently occurring) stage movements and would be responsible for the lack of association between predictor variables and (movement) of stages. Rather, experiments including random assignments using theoretical constructs that are each manipulated separately yield the least ambiguous results and conclusions [77], which for the TTM would involve manipulating the processes of change in a stage-matched versus stage-mismatched manner to evaluate the effects on health behaviour changes [54]. However, the few studies to date that have attempted to do so, have found little support for the superiority of matched over mismatched interventions [235-237], suggesting that the studies showing beneficial effects for TTM-based interventions compared to other types of interventions may be a consequence of other mechanisms and characteristics of the TTM-interventions, but not a consequence of stage-matching.

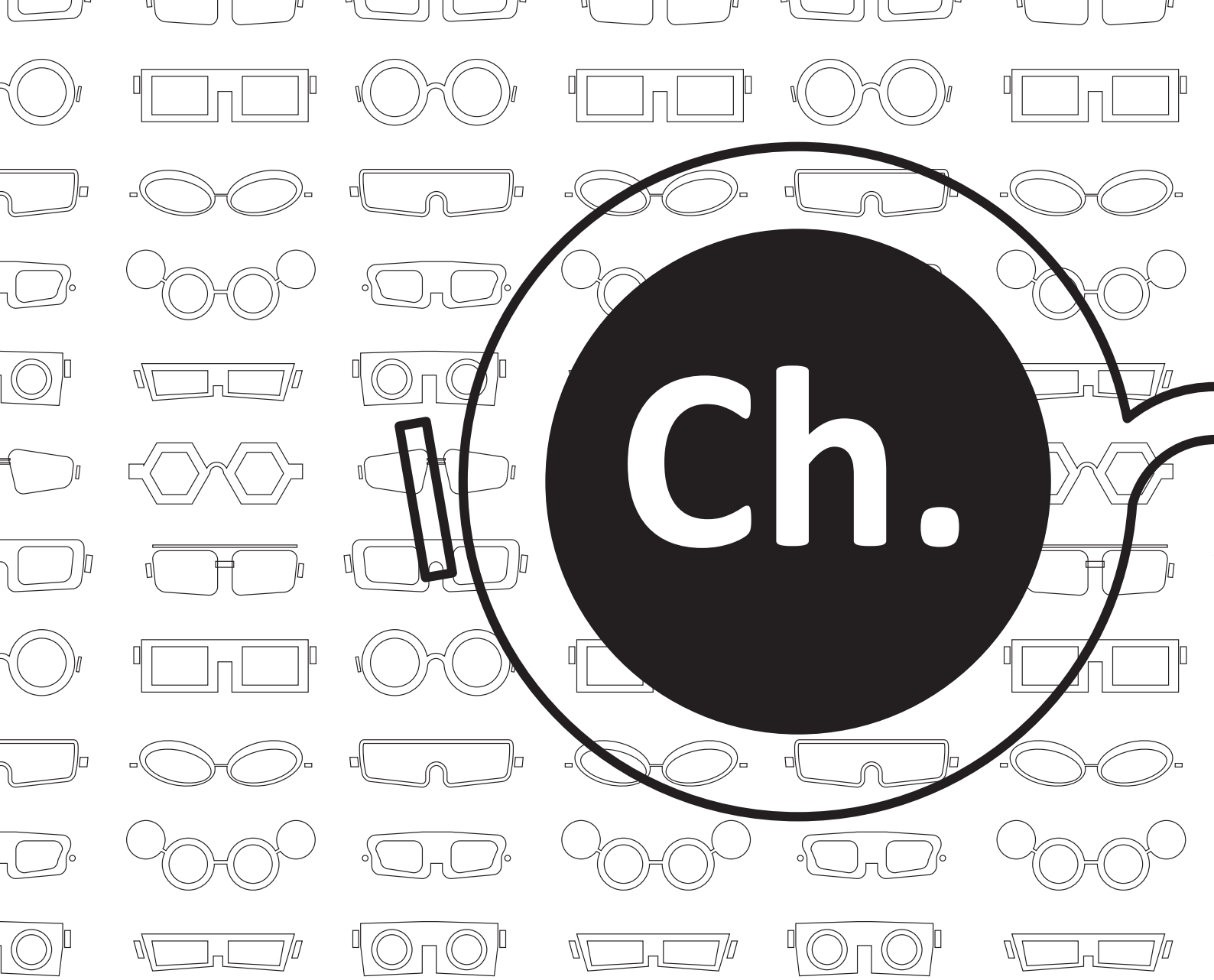
As noted previously, the earlier stages (such as precontemplation and contemplation) were underrepresented in our current research sample, while patients with relatively high levels of motivation for treatment were over-represented in our sample. This is a common limitation in psychotherapy research [238], which shows an absence of studies conducted among people with SMI who do not receive mental health treatment. Consequently, the results of the current study may not be generalizable to the entire population of outpatients with SMI, in particular those patients who are not in contact with services and to those who are more ambivalent or hesitant to engage with psychiatric treatment services.

Another limitation to the current study is the possibility of model misspecification and/or omitted variables. Misspecification of the model may have occurred due to misspecification of the relations between the stages and treatment engagement. Although efforts were made to compare different structural models and to include essential constructs of TTM such that a model was derived which was most plausible considering both theory and data, the final model that was tested may not have been

the most accurate or complete structural model for testing the effects of TTM stages of change on treatment engagement. For example, the merging of the stages preparation and contemplation into one stage using the algorithm, was done to increase comparability with the URICA-D models (and the limited number of patients in this stage also limited our ability to test the model on this stage) but is essentially not in line with a theory of five stages. Regarding omitted variables, it should be noted that the current study did test the 'complete' process model of TTM, as this was not feasible with the current data. Variables such as the ten different processes of change, self-efficacy, temptation and all five stages may be incorporated into larger and more complete SEM-analyses to test essential TTM process models, including hypotheses regarding the progression from one stage to another.

Conclusion and implications

Current popular methods for assessing stages of change, namely the staging algorithm and the URICA, were found to show low convergence regarding motivation to engage with psychiatric treatment and thus seem to assess different aspects of it. Also, both measures generally did not show the expected associations with other TTM constructs nor were the associations between stages and other TTM constructs consistent across two time points. Regarding associations between stages and treatment engagement, these were consistent across time and different patient diagnostic groups, but the stages showed limited ability to explain treatment engagement behaviour and generally did not show the theoretically expected differentiation between stages and the mean level of treatment engagement. When using existing measures to assess the TTM constructs, it seems that we still lack empirical support for the validity of the stage construct of the TTM model as a way of evaluating the patient's motivation for engaging with the treatment services. This is problematic, as the potentially unique and useful contribution that the TTM can bring to the psychiatric treatment of patients with SMI, can only be adequately studied if we can reliably and validly assess its main constructs. The current study underscores the need for such measures. It has been noted that, although the TTM has been challenged for its theoretical coherence, it "remains one of the few attempts to operationalize different change strategies within a common paradigm" [238]. The questions that TTM raises remain important for clinical practice, including whether there are critical periods during which specific intervention strategies should be applied to facilitate treatment engagement and improve clinical outcomes for patients with SMI. Future studies should therefore aim to (develop and) test other methods of stage assessment, to provide a foundation for further research into the utility of the TTM in psychiatric treatment services for patients with SMI.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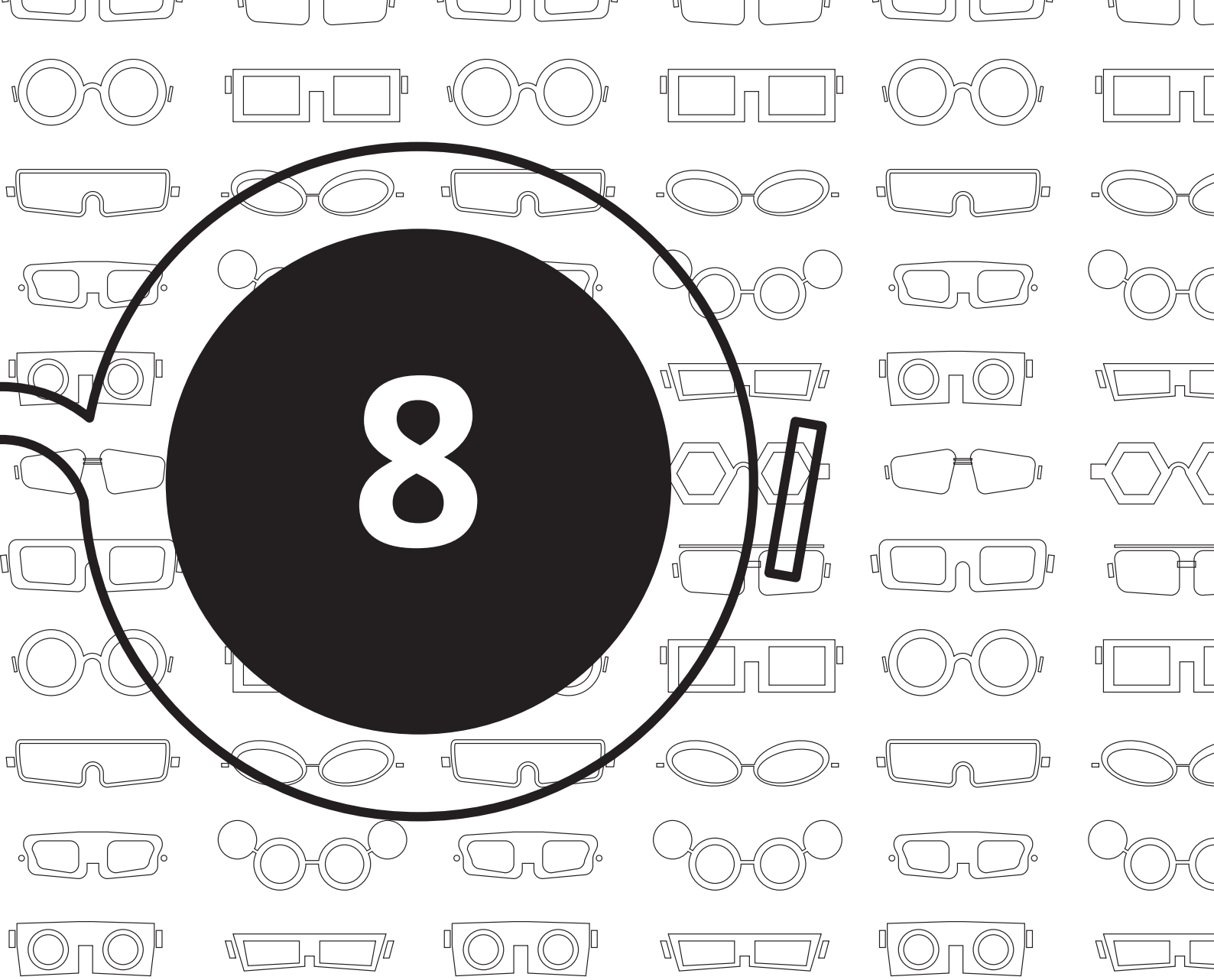
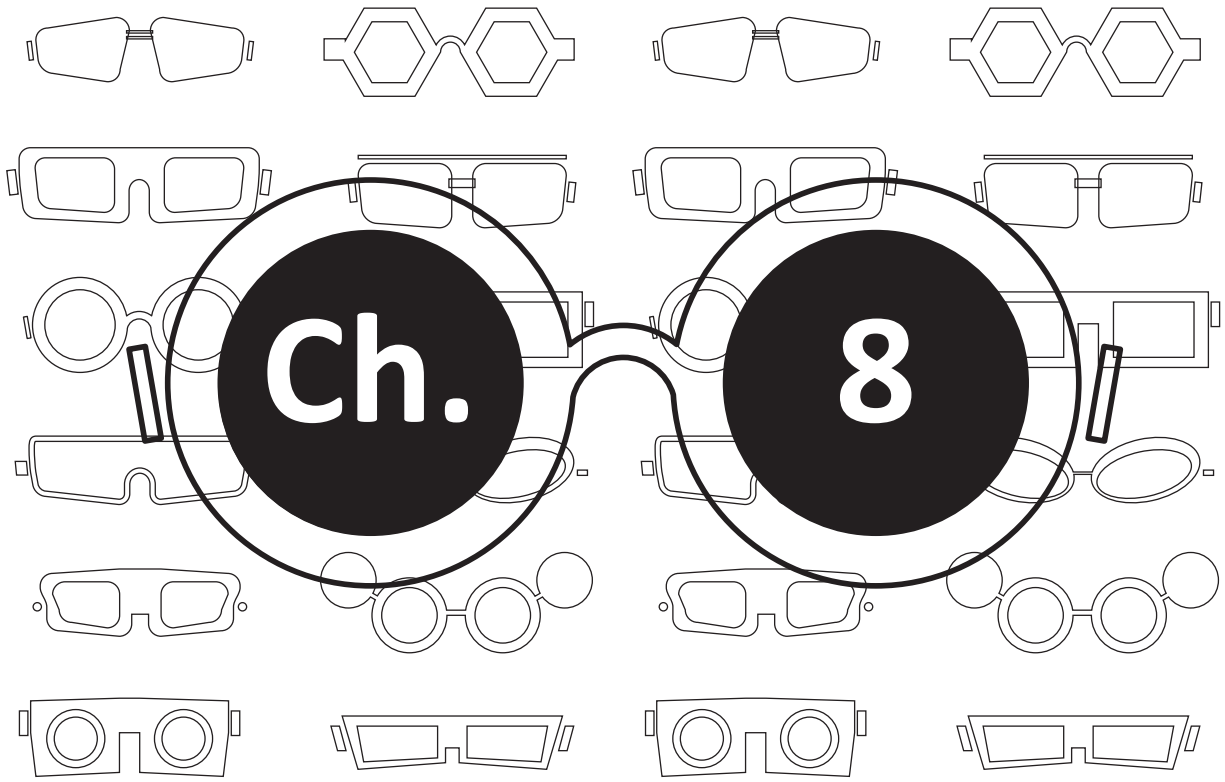


8

The effects of Motivation Feedback in patients with severe mental illness: a cluster randomized controlled trial

Jochems, E.C., van der Feltz-Cornelis, C.M., van Dam, A., Duivenvoorden, H.J., Mulder, C.L. 2015. The effects of motivation feedback in patients with severe mental illness: a randomized controlled trial. Neuropsychiatric Disease and Treatment, 11, 3049-3064.



Objective

To evaluate the effectiveness of providing clinicians with regular feedback on the patient's motivation for treatment in increasing treatment engagement in patients with severe mental illness (SMI).

Methods

Design: Cluster randomised controlled trial (Dutch Trials Registry NTR2968). Participants: adult outpatients with a primary diagnosis of a psychotic disorder or a personality disorder and their clinicians, treated in 12 community mental health teams (the clusters) of two mental health institutions in the Netherlands. Interventions: monthly motivation feedback (MF) generated by clinicians additional to treatment as usual (TAU) and TAU by the community mental health teams. Primary outcome: treatment engagement at patient level, assessed at 12 months by clinicians. Randomisation: teams were allocated to MF or TAU by a computerized randomization program that randomized each team to a single treatment by blocks of varying size. All participants within these teams received a similar treatment.

Results

The 294 randomized patients (148 MF, 146 TAU) and 57 clinicians (29 MF, 28 TAU) of 12 teams (6 MF, 6 TAU) were analysed according to the intention to treat principle. No statistically significant differences between treatment groups on treatment engagement were found (adjusted mean difference=0.1,95%CI=-2.2 to 2.3,p=0.96,d=0.00). Pre-planned ancillary analyses showed statistically significant interaction effects between treatment group and primary diagnosis on treatment motivation and quality of life (secondary outcomes), which were beneficial for patients with a primary diagnosis of a personality disorder but not for those with a psychotic disorder. There were no reports of adverse events.

Conclusion

The current findings imply that monitoring and discussing the patient's motivation is insufficient to improve motivation and treatment engagement, and suggests that more elaborate interventions for SMI patients are needed.

Introduction

Background

A common consideration in clinical practice is that evaluation of the patient's motivation may help to understand how a patient may best be engaged in treatment [29,35-37,228]. Patients with severe mental illness (SMI), such as those with psychotic disorders or severe personality disorders, are often considered not motivated to seek treatment [239] or fail to adhere to treatment programs [240,241]. Regular assessment of motivation for engaging in treatment and providing this as feedback to the clinician might be a promising approach to both monitor the patient's motivation and provide a useful structure in the communication about it. Such communication may help to improve motivation for treatment and treatment engagement [197]. Meta-analyses have shown beneficial effects of employing feedback to clinicians on their patients' mental health outcomes [39,49,242]. However, most clinician feedback research has focused primarily upon treatment outcomes [154,243-245] and was unable to determine which specific elements from the feedback provided the mechanism(s) of action. Motivation for treatment has been used as part of such feedback systems, yet to our knowledge and based on an extensive review [39], no previous study has investigated the effects of providing feedback that is exclusively based on the SMI patient's motivation for treatment. This warrants the current investigation.

The theoretical basis of the motivation feedback (MF) intervention was founded on Self-Determination Theory (SDT); a theory of motivation that defines several types of motivation that fall along a continuum of self-determination and describes how social and cultural factors can facilitate or undermine people's sense of self-determination [48,65]. SDT states that the most externally determined form of treatment motivation is when a patient remains in treatment because he feels pressured to do so [65]. This external motivation could, for example, be present in a patient who is court-ordered into treatment [129]. Also relatively external yet somewhat more autonomous is introjected motivation, where a patient is driven by feelings of guilt or shame. A patient with introjected motivation might act to avoid disapproval or guilt or receive approval or praise (eg from the mental health worker or important others). More autonomous motivation is present in a patient with identified motivation, who recognizes and accepts that treatment is useful for achieving personally relevant goals [65]. An example is a patient who finds it important to take medications as a way of preventing relapse. According to SDT, engaging in treatment for a long time requires that patients internalize treatment values since behaviours that are more autonomous (ie more self-determined) are more likely to be performed again, whereas behaviours that are primarily driven by external motives will only be performed in the presence of such perceived external pressures [65,82].

Objectives and hypothesis

The current study aimed to evaluate the effectiveness of a motivation feedback (MF) intervention compared to treatment as usual (TAU) in outpatients with SMI treated by community mental health teams. It was hypothesized that SDT-based MF would lead to increased treatment engagement (primary outcome), and to a beneficial shift in the SDT motivation continuum towards more autonomous motivation and improved psychosocial functioning and quality of life (secondary outcomes) in outpatients with SMI.

Methods

Trial Design and ethics statement

The current study was a two-center cluster randomized trial comparing Motivation Feedback (MF) to treatment as usual (TAU). Cluster randomization was chosen to avoid contamination bias[246]. The full trial protocol is available elsewhere [197]. Briefly, the cluster randomized controlled trial was designed with the primary objective to determine the effectiveness of a Motivation Feedback (MF) intervention on treatment engagement (primary outcome) of outpatients with psychotic disorders and personality disorders, compared to treatment as usual (TAU) in community mental health care teams (the clusters). Secondary outcomes include treatment motivation, psychosocial functioning and quality of life. The specific aspects of the broader trial design, including details of settings, interventions, randomization and blinding, are addressed in the following paragraphs. Discrepancies between the original protocol and the current report are described under methods and results; these included the handling of skewed outcomes in the statistical analyses and the smaller sample size due to lower than expected recruitment rate.

The current study was approved by the Medical Ethical Committee for Mental Health Care Institutions (MotivaTe-IT; trial number NTR2968, Netherlands Trial Register, http://www.trialregister.nl/trialreg/admin/rctview.asp?TC=2968) as well as by the scientific committees of the Western North Brabant Mental Health Center and Breburg Mental Health Center, the speciality mental health institutions where the data were collected. The authors confirm that all ongoing and related trials for this intervention are registered. All procedures

were conducted according to the principles expressed in the Declaration of Helsinki, including the obtainment of written informed consent by the participants. Results are presented in accordance with the CONSORT statement for cluster randomised controlled trials.[247].

Setting and participants

The current study was initiated by GGZ Westelijk Noord Brabant, a specialty mental health center located in a semi-urban area in the south west of the Netherlands. GGz Breburg, another specialty mental health center in the same semi-urban area, was also approached and agreed to join the study.

Within these two centers, patients were eligible for participation if they had a primary diagnosis of a psychotic disorder or a personality disorder (as diagnosed by the psychiatrist of the team using the DSM-IV-R criteria and obtained from the medical record), were aged between 18 and 65 years old and received individual outpatient treatment for their mental disorder. Exclusion criteria were an insufficient command of the Dutch language (which was estimated by the clinician who was most frequently involved with the patient), and a documented diagnosis of dementia or chronic toxic encephalopathy.

Treatment teams were eligible for participation if they provided outpatient assertive community mental health care to eligible patients. At the start of the study, 12 teams of the two mental health centers fulfilled this criterion and were approached for participation. Specifically, these teams included a forensic psychiatric outpatient clinic, three specialized psychotic outpatient treatment programs and eight function-assertive community treatment teams (FACT-teams [14]). FACT-teams provide assertive, outreaching, community-based, and supportive psychiatric services to individuals with SMI [14]. Clinicians within the approached teams were eligible for participation if they were the primary health care practitioner involved with the patient, meaning that this clinician had the most frequent contacts with the patient. All twelve teams agreed to participate in the study and as such, the trial was conducted within these teams between May 2011 and October 2013.

Interventions: Treatment as Usual and Motivation Feedback

Treatment as usual (TAU)

In the TAU group (consisting of six teams or clusters), treatment was provided by multidisciplinary assertive outreaching community mental health teams. TAU was guided by the patient's individual symptoms and needs for care and could include assertive outreach, medication, social and financial management, job counselling, crisis interventions, cognitive (behavioural) therapy, the strengths-based approach and/or supportive structured therapy[14]. Individual case management was offered to patients who were more stable and needed long-term care, but intensive assertive outreach was offered to patients at risk of relapse or neglect, often by several clinicians working with a shared caseload [14]. We did not seek for uniformity in TAU as such diversity reflects reality. Clinicians in the control group continued TAU during the course of the study.

Motivation Feedback (MF)

MF was provided in addition to TAU in patients randomized to the MF group (consisting of six teams or clusters). Patients and clinicians in the MF intervention group were asked to fill in a Short Motivation Feedback List (SMFL) every month up to twelve months after baseline assessment. The SMFL consists of eight statements that relate to the level and type of the patient's treatment motivation, based on three types of motivation postulated by SDT [65,82]: external, introjected and identified motivation. The SMFL was shown to be reliable for these three types of motivation; congeneric estimates of reliability ranged from 0.81 to 0.93 [203,218].

Before commencing the study, clinicians were trained by the principal investigator (PI) in the principles of SDT and the use of MF. The training consisted of a presentation about the principles and concepts of SDT, exercises to learn how to distinguish the needs for autonomy, competence and relatedness, and practicing MF assessments with other clinicians (not yet with patients) during this training, to familiarize themselves with the feedback and how to communicate about it. Clinicians received three booster sessions over the course of the study to evaluate and discuss their progress and experiences together with other colleagues who also participated in MF. During the course of the study, the PI received filled-out SMFLs from the clinicians and subsequently provided the clinician with MF graphs via email. An example of such a graph can be found in our published research protocol [197]. The evaluation of the SMFL and the graph could serve as a starting point for conversations between the patient and the clinician regarding the motivation of the patient. Clinicians were instructed to stimulate internalization of motivation by supporting the patients basic psychological needs of autonomy, competence and relatedness, in line with SDT [64]. The intention was that the conversation would revolve around sources of motivation behind treatment

goals. Clinicians were free to decide for themselves how they would structure this conversation with the patient, such as discussing only one item or several, or discuss differences between patient's and clinician's vision, and they were free to decide how long this would take. The duration and frequency of SMFL assessments were monitored by the research team. Both the number of face-to-face contacts between patient and clinician and the number of performed SMFL assessments were counted, to evaluate how many of the possible SMFL assessments were actually performed.

During the course of the study, clinicians were regularly contacted by the PI to monitor the MF intervention and to discuss progress and experiences together with other colleagues who also participated in the MF intervention. These evaluation sessions took place four times over the course of the study. To aid clinicians in remembering to perform SMFL assessments, they were given bookmarks to use in their paper planners, posters of the study were hung up in the team offices, electronic reminders were regularly placed in the electronic planners, the PI was regularly present in the team office to check up on progress and sent emails to remind the clinicians of using MF.

Outcomes

The outcomes of interest were treatment engagement (primary outcome) and treatment motivation, psychosocial functioning and quality of life (secondary outcomes) [197]. We also administered a comprehensive number of other instruments, including measures for baseline characteristics used in the current study, for which we refer to our research protocol [197]. All instruments were administered in Dutch language.

Primary outcomes

Treatment engagement was measured with the Service Engagement Scale (SES) that was filled out by clinicians. The SES was developed to measure engagement with community mental health services [199]. It comprises 14 items that assess availability, collaboration, help seeking and treatment engagement behaviours (including medication adherence). The items are rated on a 4-point scale ranging from 0 (not at all) to 3 (most of the time). The SES has shown good psychometric properties and has previously been used in studies with patients with psychotic disorders [161,248,249]. The SES total scale score was used as the outcome measure in this study, where higher scores denote higher treatment engagement. Reliability of the total scale score in the current sample was considered good, as evaluated by a congeneric estimate of reliability of 0.91. Additionally, we included the number of missed appointments (no-shows), as a more objective measure of treatment engagement [197]. These were obtained from the medical records.

For patients with a primary diagnosis of a psychotic disorder, the Morisky Medication Adherence Scale (MMAS)[250] was used to assess patient self-reported antipsychotic medication adherence. The MMAS is a self-report scale that consists of 8 items asking about a specific medication-taking behaviour, such as "When you feel that your symptoms are under control, do you sometimes stop taking your medicine?". The items can be scored 'yes' or 'no' and the total scale score theoretically ranges from 0 to 8, with higher scores indicating better medication adherence. The congeneric estimate of reliability was 0.82 in the current sample.

Secondary outcomes

Motivation for engaging in treatment as postulated by SDT was measured with the Treatment Entry Questionnaire (TEQ) [126,218] that was administered to both patients and clinicians. It contains three subscales (external, introjected and identified motivation), each with 6 items rated on a scale from 1 (strongly disagree) to 7 (strongly agree) and subscale scores are computed by averaging the item scores and multiplying this by the number of items. The congeneric estimates of reliability for TEQ subscales were acceptable in the current study sample as evaluated by congeneric estimates of reliability; 0.78 for identified motivation, 0.72 for introjected motivation and 0.75 for external motivation[218]. Construct validity for the TEQ was supported by significant associations with therapist-rated service engagement (correlations between -0.15 and 0.58 ($p<0.01$), depending on the subscale), patient- and clinician-rated therapeutic alliance (eg $r = 0.47$ and $r = 0.25$, $p <0.01$, respectively with identified motivation) and legally mandated treatment[218]. Higher scale scores denote higher levels of that type of motivation.

The patient's psychosocial functioning was measured with the Dutch version of the Health of the Nations Outcome Scales (HoNOS) [163]. The HoNOS was administered as a semi-structured interview with the patient, performed by independent research assistants (mostly graduate students in psychology and medicine). The researchers had no involvement in the patient's treatment. Patients were interviewed at the team office or at home, depending on their preference. The HoNOS quantifies health and social problems of the previous two weeks and contains 12

items that refer to behavioural problems, cognitive and physical impairments, symptoms, and social (dis) functioning. HoNOS items are scored on a scale from 0 (no problem) to 4 (severe problem) . The total scale score is computed by adding the 12 items. A higher total score on the HoNOS denotes more severely impaired psychosocial functioning. The psychometric properties of the total scale score were shown to be acceptable and sensitive to change [163]. Reliability of the total scale score was adequate in the current sample, as reflected by a congeneric estimate of reliability of 0.77.

The patient's quality of life was assessed with the Manchester Short Assessment of Quality of Life (MANSA) [167,168]. The MANSA is a self-report questionnaire that asks the patient how satisfied he/she is in the following life domains: living situation, social relationships, physical health, mental health, safety, financial situation, work situation and life as a whole. The mean score on the 12 MANSA items was used as the outcome measure, of which the psychometric properties are considered satisfactory [168]. The congeneric estimate of reliability was 0.91 for the MANSA total score in the current sample. Higher scores denote a higher perceived quality of life.

Sample size

The sample size was calculated on the basis of our primary hypothesis, that MF would be more effective than TAU in enhancing treatment engagement, as measured with the Service Engagement Scale at 12 months after baseline assessment. The difference between the motivation feedback group and control group for the primary outcome was based on a power of 0.80, an alpha of 0.05 (two-tailed), and an effect size (standardized mean difference) of approximately 0.40[197]. The clustering of patients within clinicians was accounted for using the variance inflation factor formula $f = 1 + (m - 1)\rho$, with an estimated cluster size (m) of 6 patients per clinician and the within-cluster correlation (ρ) was estimated from a previous study to be around 0.07 [153]. Using these parameters and including an additional correction for expected loss-to-follow-up, it was estimated that the required total sample size should be 350 patients [197].

Randomization

A computer-generated list of random numbers was used to randomly assign each team to a treatment condition, such that all clinicians and patients in the same team were randomized to a similar treatment. The randomization sequence was created using software from www.randomization.org with a 1:1 allocation ratio using random block sizes of 1, 2 and 3. The random allocation sequence was performed by authors ECJ and HJD prior to approaching treatment teams, such that treatment teams and its members were still unknown and were numbered blindly before entering team numbers into the computer program.

Blinding

At baseline, patients were unaware (blind) as to which treatment condition they had been randomized to. Clinicians had to be made aware of treatment condition as those randomized to MF needed to receive the necessary training prior to baseline assessments such that MF could start immediately thereafter. This blinding procedure is common in psychiatric intervention research [246]. At the 12-month assessment, clinicians and patients were not blind to treatment condition while filling in questionnaires, whereas independent research assistants who looked up information from the medical record and performed interviews with patients were blind to treatment allocation.

Procedures

Treatment teams were approached by the PI and clinicians working in these teams received oral and written information about the study and were asked for informed consent. Subsequently, clinicians were asked to provide their caseload to the PI, who randomly selected 10 eligible patients for participation (or if fewer than 10 eligible patients were available, all the eligible patients were selected). Clinicians explained the selected patients about the contents and procedure of the study and asked for participation. To enhance the likelihood of participation, patients were given an incentive of 15 euro for participating. If a patient consented to participate, an appointment was made with the PI, sometimes accompanied by the clinician for the patient's comfort and/or the investigator's safety. The patient received oral and written information about the contents and procedures of the study once more before signing informed consent. Subsequently, patients and clinicians completed the baseline assessments. Independent research assistants accompanied patients during the assessment, such that they could help if necessary. This could, for example, include reading items aloud to accommodate patients with concentration problems and/or explaining items that were not readily understood. This procedure took about two hours for most patients and about 20 minutes for clinicians.

After 12 months, patients and clinicians were contacted for the follow-up assessment. Patients who had ended treatment or dropped out from treatment were nonetheless contacted for a follow-

up assessment. Clinicians were asked to complete their follow-up assessment for all patients who were enrolled at start of the study. Furthermore, it was assessed to what extent the MF intervention was performed by the clinicians.

Statistical Methods

Several outcomes, including the primary outcome and the motivation questionnaires, were not normally distributed at follow-up assessment and transformations were not successful. To deal with this, difference scores were calculated as follow-up assessment minus baseline assessment. The difference scores showed normal distributions for all outcomes, as evaluated by histograms and normal probability plots. Subsequently, they were used as outcomes in this study.

Differences in demographic and clinical variables at baseline between the intervention group and control group, and between participants and non-participants, were evaluated with independent samples *t*-tests and chi-square tests. All analyses were conducted using a significance level of $p<0.05$ (two-sided) and unstandardized estimates of regression coefficients (β), 95% confidence intervals (95%CI), interquartile ranges (IQR), intraclass correlation coefficients (ICC) and standardized mean differences (SMD) are reported where appropriate. Statistical tests were performed using IBM SPSS Statistics 21 (SPSS Inc., Chicago, IL, USA) and SAS version 9.3 (SAS Institute Inc).

Intention to treat analyses

All outcomes were analysed with multilevel linear regression models. As stated in the study protocol[197], it was explored which and how many levels would be appropriate for inclusion in the multilevel analyses. Not all available levels (ie mental health institutions, teams, clinicians, patients, measurements) could simultaneously be included as random effects due to singularity problems. Considering the variances explained at each level (on average: 81% at patient-level, 8% at clinician-level, 1% at team-level, 0% at mental health institution) and considering that the dispersion of patients over teams was larger than the dispersion over clinicians (12 to 38 patients per team versus 1 to 10 patients per clinician), it was decided to include 'team' as the second level in the analyses.

Further, all analyses were performed both unadjusted and adjusted for baseline imbalancedness between treatment groups. In unadjusted analyses, models included treatment as fixed effect and clustering at team-level as a random effect. In adjusted analyses, models included treatment and a multivariate confounder score as fixed effect, and clustering at team-level as random effect. The multivariate confounders score was calculated using a set of observed potential confounders to control for the observed differences in the distribution of baseline variables between treatment groups [251]. The multivariate confounder score included: ethnicity, sex, educational level, primary diagnosis, addiction problems, the clinician's years of clinical working experience and the baseline value of the respective outcome (e.g. the baseline score on the SES was added to the confounder score in the analyses for SES at follow-up). Further, for all models, missing data on baseline variables were not imputed; only all observed data was used. Missing data on outcomes were considered missing at random (MAR). Restricted maximum likelihood was used as the estimation method.

Additional analyses

Per protocol analyses

As stated in the study protocol[197], we wanted to investigate the effect of actual exposure to the intervention on outcomes. To this end, a per protocol analyses was performed in which a median split was performed on the number of SMFL assessments, such that patients who performed MF less than four times were removed from analyses despite their randomization to MF. The modelling approach of these per protocol analyses was similar to the intention-to-treat analyses.

Test of interaction effects: the role of primary diagnosis and age

As stated in the study protocol [197], we were also interested in determining whether treatment effects were dependent on baseline characteristics of the sample. To limit the number of tests (and accompanying problems of multiple testing), it was decided to test for differences between patients with psychotic disorders and patients with personality disorders and to test for potential differential effects of age. The two diagnostic groups constitute the great majority of patients treated in assertive outreach teams in the Netherlands [14], yet previous studies have largely focused on patients with psychotic disorders and ignored the experiences of service users with personality disorders in motivational interventions and/or outcome feedback systems [152,154,252]. Therefore, exploratory analyses were performed to detect whether the effects of treatment on all outcomes were modified by the primary diagnosis. Additionally, as previous studies in community mental health care for patients with SMI in the Netherlands have shown that treatment

outcomes such as psychosocial functioning were dependent on patient age[17], it was decided to explore whether the effects of treatment on all outcomes were modified by age. We tested these possible interactions (treatment group by primary diagnosis and treatment group by age) for significance on all outcomes.

Results

Participant flow, recruitment and numbers analysed

The numbers of participants who were randomly assigned, received intended treatment, were lost to follow-up and numbers analyzed are shown in the flow-chart (Fig. 1). Ultimately, a total of 57 clinicians and 294 eligible patients signed informed consent and completed baseline assessments between May 2011 and September 2012. The recruitment process was slower and more difficult than expected and despite extending the inclusion period by 4 months, the inclusion of patients did not reach the estimated necessary 350 patients.

In total, 58% of the eligible patients (294 out of 507) and 80% of clinicians (57 out of 71) actually agreed to participate. Of the 155 patients who declined participation in the trial, 53 patients (34%) did not feel capable of filling in the questionnaires. For example, they found it too long or too much (n= 18) or they felt they were too ill or incapable at the moment (n= 12). Another 51 patients (33%) were not interested or did not feel the need to participate and 16 patients (10%) said they did not want to have anything to do with mental health affiliations. Another 18 patients (12%) did not see the use of scientific research in general, 9 patients (6%) started out with the baseline assessment but quit before completing, and 8 patients (5%) did not give a reason for declining participation. Additionally, 58 patients could not be contacted despite several attempts. Patients who declined participation were significantly more often those with a primary diagnosis of a psychotic disorder and less often those with a personality disorder ($\chi 2$ (1, N = 470) = 8.70, $p<0.01$). At 12 months, 253 patients (86%) were re-assessed. Numbers lost to follow-up were not significantly different between intervention groups. The group that was lost to follow-up was significantly more often of non-Dutch ethnicity (48% versus 26%, p<0.01) and more often had a legal mandate for treatment (18% versus 7%, p = 0.03) compared to completers. Clinicians completed their follow-up assessments for 278 patients (95%).

Baseline characteristics

The baseline socio-demographic and clinical characteristics of participating patients are shown in Table 1. At baseline, several patient characteristics were unequally distributed over the two treatment groups (see Table 1). Clinicians in the MF group had an average of five more years of working experience (20 years versus 15 years, $p<0.01$).

Adherence to MF intervention

On average, four assessments with the SMFL were done per patient (SD=3, observed range=0 to 11), representing 45% of the possible SMFL assessments that could have been performed considering the frequency of contacts with patients. Clinicians reported that the median time of discussing the SMFL with the patient was 10 minutes (IQR=5 to 15 minutes). Eighteen out of 148 patients (12%) never completed any SMFL assessments (reasons are shown in Figure 1). All clinicians in MF had at least one patient that was actively involved in MF, so there was no clinician that never performed SMFL assessments.

Intention-to-treat analyses of outcomes

Table 2 shows pre- and post-intervention medians and the results of intention-to-treat analyses for all outcome measures, both unadjusted and adjusted for the multivariate confounder score. In the following, we will describe the results of the adjusted analyses, which are similar to the results of unadjusted analyses in terms of interpretation.

It can be seen in Table 2 that we found no statistically significant differences between the MF and TAU groups in terms of treatment engagement, neither as measured with the SES nor as measured by the number of no-shows. Neither did we find significant differences between treatment groups in patients with primarily psychotic disorders, regarding their self-reported medication adherence. Regarding motivation for treatment, no statistically significant treatment effects were found for patient-reported motivation, but clinicians reported that MF reduced patients' introjected motives for engaging in treatment more than TAU (AMD= -4.5, 95%CI= -6.4 to -2.6, p<0.001). Neither any of the other motivation scales, nor the patient's psychosocial functioning nor quality of life were significantly differently affected between the two treatment groups.

Ancillary analyses

Per protocol analyses

The results of the per protocol analyses were comparable to the findings of the intention-to-treat analyses. That is, no statistically significant differences between the MF and TAU groups were found in terms of treatment engagement (as measured with the SES and number of no-shows) and patient-reported motivation. The findings on clinician-reported introjected motivation were confirmed such that clinicians reported a significantly higher reduction of introjected motivation in MF than in TAU (AMD= -4.9, 95% CI = -7.4 to -2.4, p<0.001). Additionally, we found an effect on clinician-reported external motivation such that clinicians reported less external motivation in MF compared to TAU (AMD= -3.2, 95% CI = -6.2 to -0.3, p<0.03). No statistically significant differences between the MF and TAU groups were found for psychosocial functioning and quality of life.

Test of interaction effects: the role of primary diagnosis and age

Results of the interaction analyses showed no statistically significant differential treatment effect of the primary diagnosis on changes in treatment engagement as assessed by the SES (p = 0.50) and the number of no-shows (p=0.09). No differential effects on patient-reported treatment motivation were found, but the interaction effect between treatment group and primary diagnosis was significant for clinician-reported identified motivation (β =-3.77,95% CI=-7.12 to -0.42,p=0.03) and clinician-reported introjected motivation (β =-5.07,95%CI=-8.67 to -1.59,p<0.01) (see Figure 2 for estimates of accompanying main effects). As depicted in Figure 2, clinicians reported opposing treatment effects for identified motivation in the two diagnostic groups, such that they reported increased identified motivation in patients with a primary diagnosis of a personality disorder and decreased identified motivation in patients with a primary diagnosis of a psychotic disorder. For introjected motivation, it was found that clinicians reported a higher increase in introjected motivation in TAU than in MF for both diagnostic groups but more pronounced for patients with a psychotic disorder.

Further, the interaction effect between treatment group and primary diagnosis was significant for patient-reported quality of life (β = -0.62, 95% CI = -1.08 to -0.15, p =0.01), such that patients reported opposing treatment effects depending on their diagnostic group; those with a primary diagnosis of a personality disorder reported a significantly higher quality of life in MF whereas patients with a primary diagnosis of a psychotic disorder reported lower quality of life in MF (see Figure 2). No significant interaction effects between treatment group and primary diagnosis were found on the patient's psychosocial functioning. Finally, none of the interaction effects between treatment group and age reached statistical significance, suggesting that the effects of treatment were not dependent on patient age.

Harms

No adverse or unintended effects of the MF intervention nor of TAU were reported.

Discussion

Main findings

There were no significant differences between MF and TAU regarding clinician-rated treatment engagement and the number of no-shows (primary outcome), and no differences regarding the patient's psychosocial functioning and quality of life (secondary outcomes). Regarding the secondary outcome motivation for engaging in treatment, we found no statistically significant differences between the MF and TAU groups on patient-reported motivation. Clinicians however, did report that MF reduced introjected motives for engaging in treatment more than TAU, albeit that the effect size was small.

Interpretation and possible mechanisms

Apparently, SMI patients felt that *talking* about their motivation with their clinician did not *change* their motivation nor treatment engagement, and clinicians felt that MF did not improve their patient's treatment engagement. These findings thus question whether monitoring and discussing the current motivational profile of the patient is necessary and sufficient to cause beneficial change in treatment motivation and behaviours such as treatment engagement.

Interestingly, the results show that clinicians *did* feel that MF changed their patient's motivation as they reported lower introjected motivation and, when four or more MF sessions were performed, also lower external motivation. This suggests that clinicians noticed a reduction in relatively external motivation for engaging in treatment in their patients in response to MF, signifying that their perception of the patient's motivation has changed in response to the intervention. We have previously found that especially introjected motivation for treatment was difficult for clinicians to estimate in the current patient sample [207] and, it is therefore reasonable to assume that the repeated conversations with

Figure 1. Flow diagram of MotivaTe-IT.

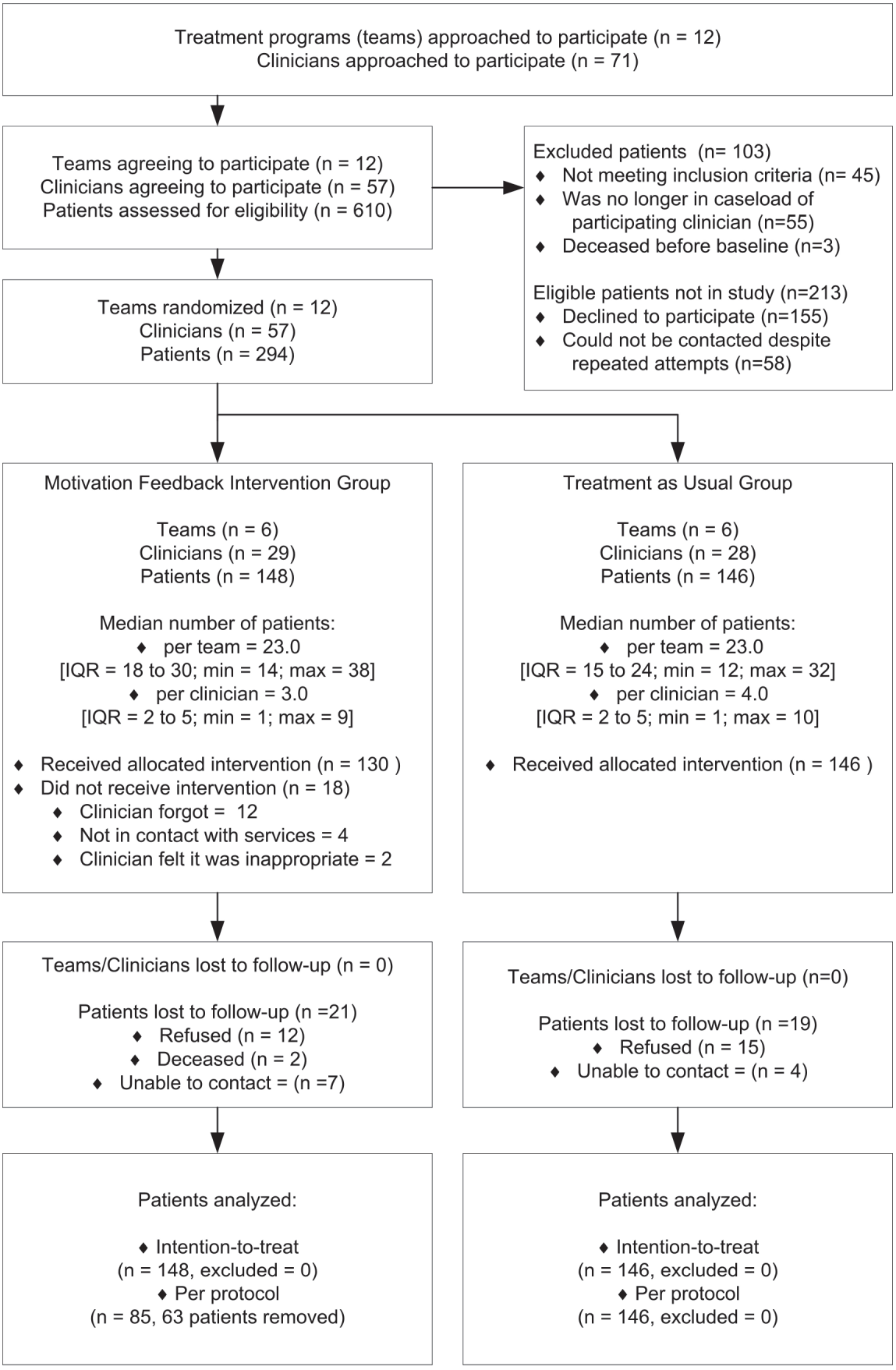


Table 1. Baseline characteristics of participating patients.

	Motivation Feedback N = 148	Treatment as Usual N = 146
Age, mean (SD)	45.47 (10.4)*	42.50 (10.0)*
Male gender, n (%)	98 (66.2)	81 (55.5)
Dutch ethnicity [A], n (%)	116 (78.4) **	92 (63.0) **
Education level, n (%)		
- No education/elementary	57 (38.5)	51 (34.9)
- Secondary school	57 (38.5)	67 (45.9)
- ≥Upper high school	32 (21.6)	27 (18.5)
Living situation, n (%)		
- Alone	88 (59.5) **	59 (40.4) **
- With partner and/or children	49 (33.1) *	70 (47.9)*
- Mental health centre facility	10 (6.8)	16 (11.0)
- Homeless	1 (0.7)	1 (0.7)
Primary diagnosis, n (%)		
- Psychotic disorder	104 (70.2)	95 (65.1)
- Personality disorder	44 (29.7)	51 (34.9)
Comorbid substance use problems[B], n (% yes)	42 (28.4)	32 (21.9)
Prescribed medication, n (%)		
- Classical antipsychotics	37 (25.0)	26 (17.8)
- Atypical antipsychotics	63 (42.6)	67 (45.9)
- Combination of typical and atypical	12 (8.1)	15 (10.3)
- Benzodiazepines	42 (28.4)	39 (26.7)
- Antidepressants	40 (27.0)	53 (36.3)
Age of first contact with mental health, mean (SD)	27.16 (10.34)	24.95 (10.24)
One or more previous hospitalizations, n (% yes)	113 (76.4)	114 (78.1)
Legal mandate, n (% yes)	11 (7.4)	13 (8.9)

[A] The definition of Dutch Ethnicity was based on the definition by the Dutch Bureau of Statistics[234].

[B] Substance abuse problem was defined as having a DSM-IV diagnosis of substance abuse and/or dependence in the medical record. * P <0.05 ** P<0.01

patients regarding their motives has led to a change in the clinician's perception of the motivation such that it became more closely aligned with the patient's perspective. As such, the intervention may have enhanced the clinician's ability to estimate the patient's perspective on motivation.

The finding regarding the change in clinician's ratings of the patient's motivation raises the question of whether this is a beneficial outcome. If one takes a process-oriented perspective[253], improving the ability of clinicians to estimate their patient's motivation or - if one were to assume that clinicians actually perceived a reduction in external motives - improving the overall quality of motivation for engaging in treatment can be considered beneficial in itself. On the other hand, if one takes an outcome-oriented perspective and observes that changes in motivation do not result in beneficial changes in treatment engagement or functional outcomes, the clinical relevance is ambiguous.

Furthermore, the interaction analyses of treatment with primary diagnosis suggest that clinicians felt the MF intervention had opposing effects depending on the primary diagnosis. It should be noted that, considering the theoretically possible changes on the TEQ scales (from -36 to 36), the observed changes are small and the clinical relevance and implications are not straightforward. Nevertheless, impaired cognitive functioning in patients with psychotic disorders [175,254], including problems with synthetic metacognition[255,256] (which involves integrating and bringing together several perceptions into complex ideas about the self and others[256]), may explain why the interaction analyses showed that MF was less effective for patients with psychotic disorders. Offering an intervention that requires patients to repeatedly reflect on internal motivational states while these patients may suffer such (meta)cognitive impairments may have been experienced as over-demanding or even frustrating, even more so for patients who had a relatively high level of motivation at the start of the study. Alternatively, the 'additional' personal attention that clinicians in MF give to their patients as reflected by an explicit interest in the nature of their motivation may be experienced as positive for those with primarily a personality disorder, whereas this may be experienced more neutral or even negative by patients with primarily a psychotic disorder.

Table 2. Effects of Motivation Feedback on outcomes in the total patient sample (intention to treat analyses)

Outcome[A]	Treatment group	T0 (baseline) Median (IQR)	T12 (post-test) Median (IQR)	Mean difference between treatment groups[1] (95% CI)	p-value[1]	Effect size	Adjusted mean difference between treatment groups[2] (95% CI)	p-value[2]	Effect size	ICC
Treatment engagement										
Clinician-reported engagement (SES; min = 0, max = 42)	MF TAU	31 (25 to 37) 31 (24 to 36)	34 (30 to 37) 36 (30 to 38)	-0.0 (-2.2 to 2.2)	0.99	0.00	0.1 (-2.2 to 2.3)	0.96	0.00	0.05
Missed appointments (number of no-shows)	MF TAU	0 (0 to 2) 0 (0 to 0)	0 (0 to 1) 0 (0 to 0)	-0.1 (-0.8 to 0.6)	0.83	0.01	0.1 (-0.7 to 0.8)	0.89	0.00	0.05
Patient-reported motivation										
Identified motivation (TEQ; min = 6, max = 42)	MF TAU	36 (29 to 40) 36 (30 to 39)	33 (30 to 37) 36 (29 to 39)	-1.4 (-3.1 to 0.3)	0.10	-0.10	-0.8 (-2.7 to 1.0)	0.37	-0.03	0.00
Introjected motivation (TEQ; min = 6, max = 42)	MF TAU	21 (14 to 28) 24 (18 to 31)	20 (14 to 26) 22 (17 to 28)	0.1 (-1.8 to 2.1)	0.90	0.01	-0.8 (-2.9 to 1.4)	0.49	-0.03	0.00
External motivation (TEQ; min = 6, max = 42)	MF TAU	15 (11 to 21) 18 (12 to 24)	12 (8 to 18) 12 (9 to 20)	1.7 (-0.2 to 3.6)	0.07	-0.11	1.0 (-1.1 to 3.1)	0.34	0.04	0.00
Clinician-reported motivation										
Identified motivation (TEQ; min = 6, max = 42)	MF TAU	30 (26 to 33) 32 (27 to 35)	29 (25 to 34) 32 (25 to 35)	-0.4 (-2.1 to 1.3)	0.66	-0.03	-0.6 (-2.6 to 1.3)	0.53	-0.03	0.01
Introjected motivation (TEQ; min = 6, max = 42)	MF TAU	20 (15 to 25) 22 (16 to 28)	17 (13 to 21) 21 (17 to 27)	-3.0 (-4.7 to -1.3)	<0.01	-0.20	-4.5 (-6.4 to -2.6)	<.001	-0.18	0.00
External motivation (TEQ; min = 6, max = 42)	MF TAU	20 (14 to 26) 21 (14 to 27)	17 (12 to 24) 21 (15 to 27)	-2.3 (-5.0 to 0.4)	0.09	-0.11	-2.0 (-4.9 to 0.9)	0.17	-0.07	0.09
Psychosocial functioning (HoNOS; min = 0, max = 48)	MF TAU	8 (6 to 13) 9 (6 to 14)	10 (6 to 14) 10 (7 to 15)	1.1 (-0.9 to 3.1)	0.27	0.07	0.6 (-1.5 to 2.6)	0.60	0.02	0.04
Quality of Life (MANSA; min = 1, max = 7)	MF TAU	5 (4 to 5) 5 (4 to 5)	5 (4 to 5) 5 (4 to 5)	0.0 (-0.3 to 0.3)	0.91	0.00	0.0 (-0.3 to 0.3)	0.85	0.00	0.04

MF = Motivation Feedback; TAU = Treatment as Usual; SES = Service Engagement Scale; TEQ = Treatment Entry Questionnaire; HoNOS = Health of the Nation Outcome Scales; MANSA = Manchester Short Assessment for quality of life; IQR = Interquartile range; ICC = Intracluster Correlation Coefficient at the level of treatment programs (teams). Effect size was calculated as the standardized mean difference between intervention groups.

[A] The theoretically possible range of scores is reported next to the abbreviations of scale names, indicated by min (minimum score) and max (maximum score).

[1] Results represent the effects of treatment allocation (MF relative to TAU), adjusted for clustering at team-level.

[2] Results represent the effects of treatment allocation (MF relative to TAU), adjusted for clustering at team-level and a multivariate confounder score (which included patient sex, ethnicity, educational level, comorbid addiction problems, years of working experience of the clinician and the baseline value of the outcome).

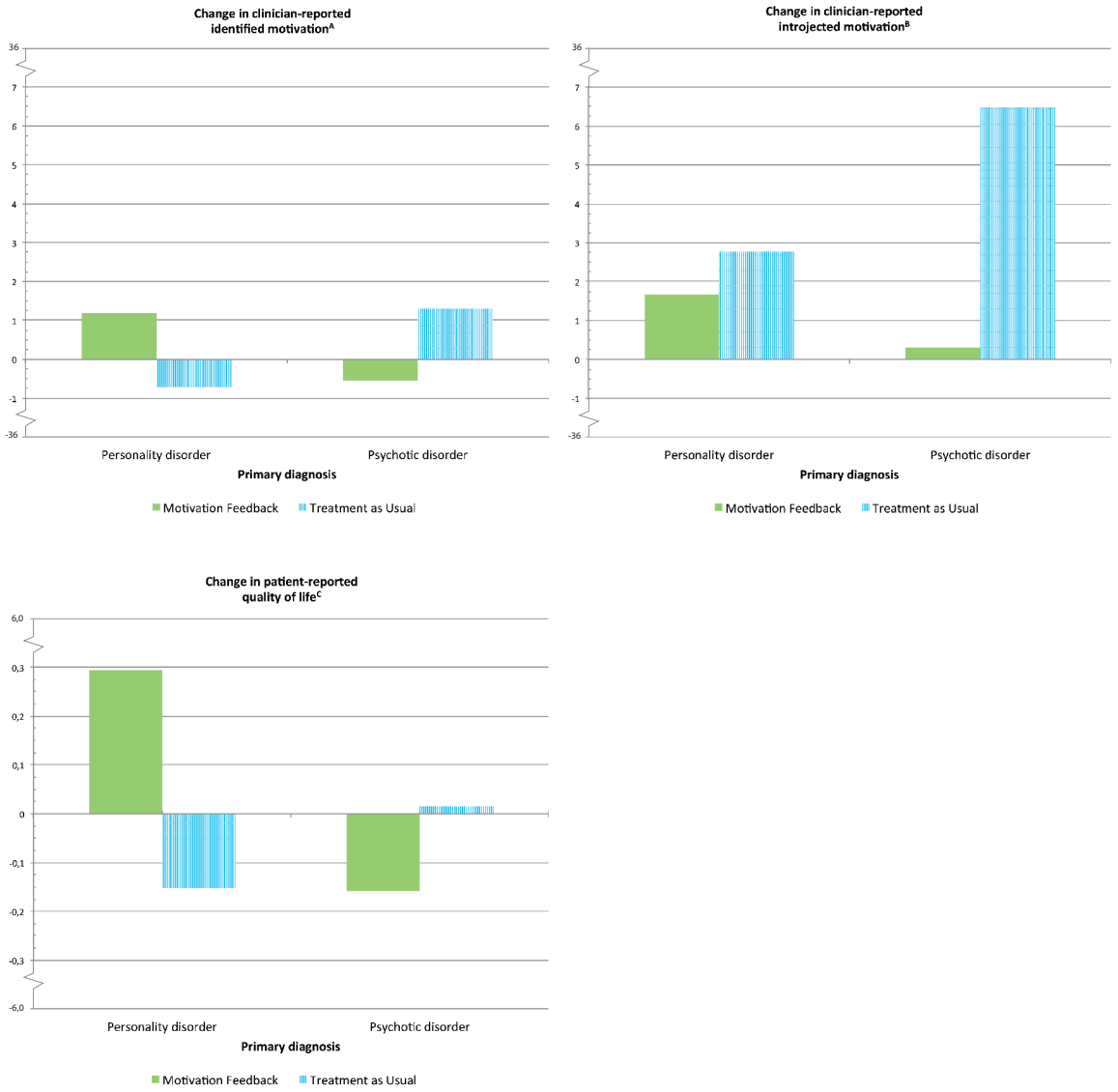
Comparison to other studies

Although the rationale of our study was plausible as demonstrated in several studies[39,152,257], this was the first study to test a feedback intervention that was explicitly based on motivation for engaging in treatment and the first study to test it in a real-life heterogeneous SMI patient population. Our results are not consistent with results from other feedback studies[148,152,257]. For example, a study by Raes et al. [257] found that providing feedback to substance abuse patients about their personal resources and readiness to change (using a motivational questionnaire based on the Transtheoretical Model[44,258]) resulted in more patients attending 8 sessions of treatment compared to a control group who did not receive such feedback. Other feedback studies, performed in non-SMI patient populations, have shown that the use of clinical support tools based on therapeutic alliance, social network support and motivation alongside outcome feedback systems are more effective at improving treatment retention and outcomes than outcome feedback alone[148,259]. It appears that successful outcome monitoring systems include additional support and services that are necessary alongside motivation feedback to cause changes in clinical outcomes, and that solely monitoring and discussing motivation is an insufficient cause for such changes.

Generalizability

The estimated sample size was not reached which may have compromised the current results, although we feel that it is reasonable to assume that the statistical inferences would not have been different

Figure 2. Statistically significant moderation effects of primary diagnosis on treatment effects (intention to treat analyses).



Note: Results are predicted change values based on a two-level multiple regression model that included treatment, primary diagnosis, treatment by primary diagnosis (interaction effect) and a multivariate confounder score which included patient sex, ethnicity, educational level, comorbid addiction problems, years of working experience of the clinician and the baseline value of the outcome. Treatment was coded as '0' (treatment as usual) and '1'(motivation feedback); primary diagnosis was coded as '0' (personality disorder) and '1' (psychotic disorder). Values on the y-axis represent change scores on the TEQ (a and b) and MANSA (c), respectively.

[A] Model: intercept (β=-2.72,df=11,p=0.07), treatment (β=1.90,df =246,p=0.19), primary diagnosis (β=2.03,df =246,p=0.08) ,treatment by primary diagnosis (β=-3.77,df =246,p=0.03), adjusted for the multivariate confounder score (β=2.00,df =246,p=0.41).

from a somewhat larger sample size. The current patient sample already showed relatively high levels of identified motivation, treatment engagement, and psychosocial functioning and low levels of no-shows to begin with (considering the range of scores). Further, the reasons that non-participants gave for declining participation in the trial, including feeling too ill or incapable, and the finding that non-participants were more likely to be patients with a psychotic disorder, suggest that the most severely ill patients did not participate. This may reflect that the current study was not successful at recruiting SMI patients with substantial problems in their motivation for engaging in treatment, treatment engagement and psychosocial functioning. Such ceiling effects and selection bias may explain why MF was not able to improve outcomes, and suggest that the findings of the current study may not be generalizable to the

general SMI outpatient population but are limited to patients who are already relatively well engaged in treatment and function at a relatively high level.

Strengths and limitations of the study

The study had several strengths including the implementation of this study in everyday practice of the community mental health teams, representative treatment as usual, independent raters, multiple methods for assessing motivation, intention-to-treat analysis, and the feasibility and low-costs of the intervention. Finally, the number of participating patients (N=294) and the follow-up rate for patients (86%) was high considering the patient population. Despite its strengths, the current study may be viewed as a 'negative trial' and common causes for negative trials include failures of concept, design/ methodology and/or logistics. We will address each of these issues in the following.

Concept and rationale. Numerous studies suggest that evaluation of the patient's motivation may help to understand how a patient may best be engaged in treatment [29,35-37,228] and other studies have found that clinicians have difficulties in estimating their patient's motivation for treatment[207], suggesting that the plausibility of the rationale for the current study was high. However, it should be noted that in the Netherlands, the accessibility and quality of mental health care for patients with SMI are currently at a relatively high level. [10]. The treatment as usual was provided by multidisciplinary treatment teams that provided tailored care guided by the patient's individual symptoms and needs for care and could include assertive outreach, medication, social and financial management, job counselling, crisis interventions and psychotherapy. Such care may have been sufficiently effective in engaging patients with SMI, especially highly motivated patients who were more likely to participate in this study, such that MF did not prove to be superior to TAU because the contrast between TAU and MF was (too) small.

Design and methodology. Although the current study was well designed[197], in hindsight we may conclude that the expected effect size was too high and that the timing of our outcome evaluation might have been suboptimal . A meta-analysis on the effects of feedback in mental health care showed that outcome feedback had beneficial effects if outcomes were measured within 9 weeks after initial assessment (d=0.10, 95%CI = 0.01 to 0.19), but these effects did not persist after 3 months[39]. Another meta-analyses on continuous feedback in outpatient psychotherapy found similar results[147]. As our study measured outcomes after 12 months, potential short-term beneficial changes of the MF intervention will have gone unnoticed and may have worn off by the end of follow-up. An additional assessment moment within the first three months of our study could have been informative in this respect, but due to practical and financial limitations this was not feasible.

Another methodological issue is that clinicians and patients were not blind for treatment allocation which may have influenced the information that they gave on the outcome questionnaires (i.e. information bias). Although this is a common design in mental health research[246] and blinding was not feasible, this might have biased the results towards no differences between the MF and TAU treatment groups or towards counterproductive effects of the MF intervention if clinicians generally did not expect the intervention to work or felt that the MF intervention was less/not appropriate for patients with psychoses.

Further, although we performed evaluation sessions with clinicians in MF alongside the trial, we have limited insight into what happened during MF sessions as these were neither recorded nor supervised. The exact communication processes within the sessions and whether or not they were autonomy supportive remain unclear, whereas such processes might explain why the MF intervention was not successful. Despite the training and evaluation sessions for clinicians in MF, we may have failed in providing the professionals with the necessary competencies and tools to be able to address different types of motivation for engaging in treatment and how to provide support for the needs of autonomy, competence, and relatedness in patients with SMI. More attention for the implementation process, including the influence of contextual factors as well as a minimum intensity of the feedback intervention, may be needed to reach favourable effects. Encouragement of both clinicians and patients into active involvement with MF is already difficult when facing patients with highly prevalent cognitive impairments, communication difficulties, and comorbidities, let alone in a health-care context faced with reorganizations, and as such this requires a unique set of competencies from both researchers and clinicians to ensure sufficient implementation.

The heterogeneity of the current study sample is considered both a strength and a limitation. Our sample largely represents a broad population of outpatients with diagnoses of psychotic and

personality disorders with a variety of co-morbid psychiatric disorders, which strengthens the generalizability of the study and enhances the probability of adoption in clinical practice. However, MF may have different effects in different subgroups of patients which could only be addressed in an exploratory manner in the current study.

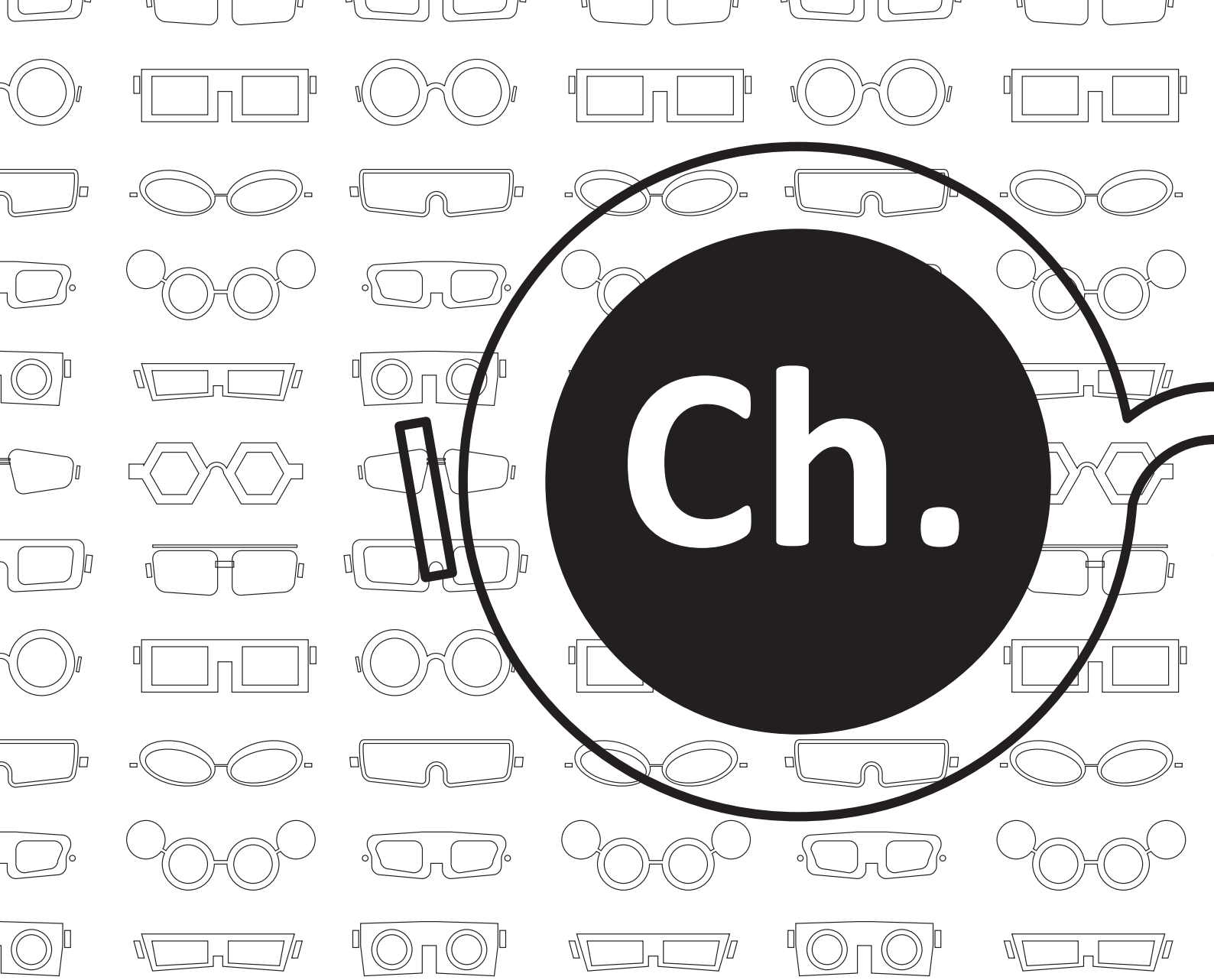
Measuring treatment engagement and motivation for engaging in treatment is complex and gold standards are lacking[20,37]. A strength of the current study is that we had both patient and clinician reports of motivation and two methods to assess treatment engagement. Other objective measures for treatment engagement and medication compliance, such as pill counts, electronic methods, prescription monitoring, or urine assay tests were not available. Future studies may use such objective measures, although all have strengths and limitations[20]. To our knowledge, this was the first study to use the TEQ in a population of patients with SMI. The reliability and validity of the TEQ in the current sample were shown to be acceptable[218] but should be improved upon and should be investigated more extensively to further determine the construct validity and sensitivity to change.

Logistics. Logistical issues that have likely negatively impacted the current study, include the difficulties in recruiting the intended number of patients - especially the recruitment of patients with low levels of motivation and low levels of treatment engagement – and organisational changes in mental health care during the course of the study, including changes in the no-show policy and costs of mental health care for SMI patients. Further, there were large variations between teams and clinicians in the number and duration of SMFL assessments, reflecting the pragmatic nature of the trial. Our findings may reflect that too few MF sessions were actually utilised (i.e. 45% on average) or that the way MF was used in the sessions was not able to beneficially affect motivation and treatment engagement. Not seldom, clinicians admitted that they regularly forgot to do SMFL assessments despite efforts from the research team to help them remember, and some reported that they were burdening the patient with 'yet another list to fill out'. Such comments seem reflective of a controlling health care context, where external demands and contingencies pressure people to behave in particular ways [225]. If this was the case, this is likely to have been a counterproductive mechanism in the MF intervention[64].

Implications for theory and practice

Theoretically, MF was expected to lead to a higher level of autonomous motivation which would in turn lead to a higher level of treatment engagement. The question remains if this hypothesis can be retained, but the negative results should not be taken as evidence against SDT, as the MF intervention may not have been able to successfully affect SDT-constructs such as patient autonomy. The motivational constructs may still be able to predict treatment engagement in both conditions and this should be addressed in subsequent investigations. Future studies should address which contextual factors influence the implementation and interpretation of (motivation) feedback interventions, as these contextual factors can impact the motivational constructs that the intervention is trying to affect[192,260].

Regarding implications for clinical practice, our study provided no evidence for the effectiveness of MF in outpatients with SMI and this discourages the implementation of the SDT-based MF intervention into community mental health care for such patients. Nevertheless, although this study didn't show beneficial effects of MF in SMI outpatients, it contributes to the evidence base for optimal clinical decision making and is relevant to prevent an overestimation of the benefits of feedback interventions. The findings imply that monitoring and discussing the patient's motivation is insufficient to improve motivation and treatment engagement in outpatients with SMI. It appears that successful outcome monitoring systems include additional support and services alongside motivation feedback which allows for beneficial changes in clinical outcomes. In the future, there may be a place for SDT-based MF as a communication tool for the clinician to explore the patient's perspective, after which other tailored interventions and services may be applied to improve patient motivation, treatment engagement and most importantly, symptomatic and functional outcomes.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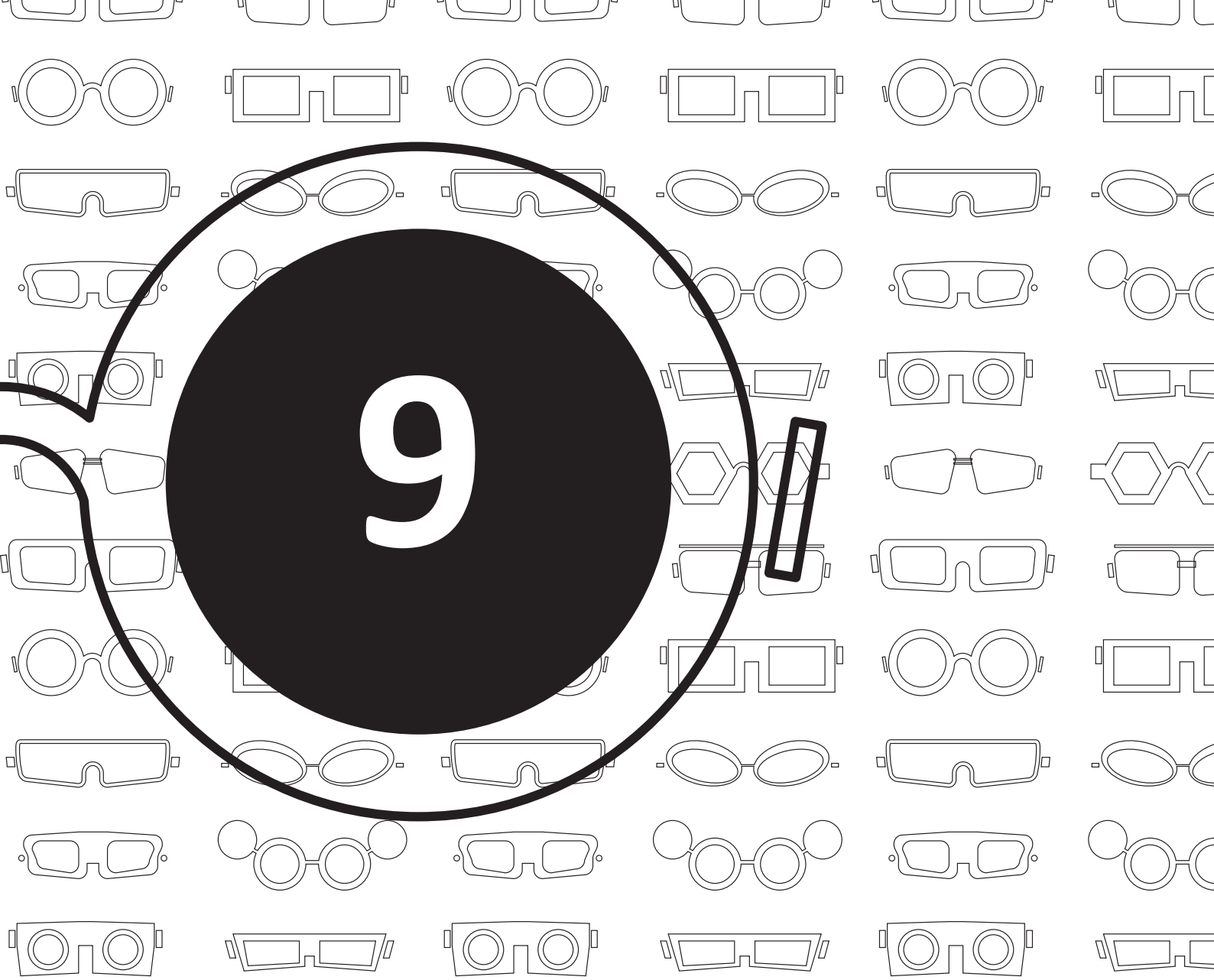
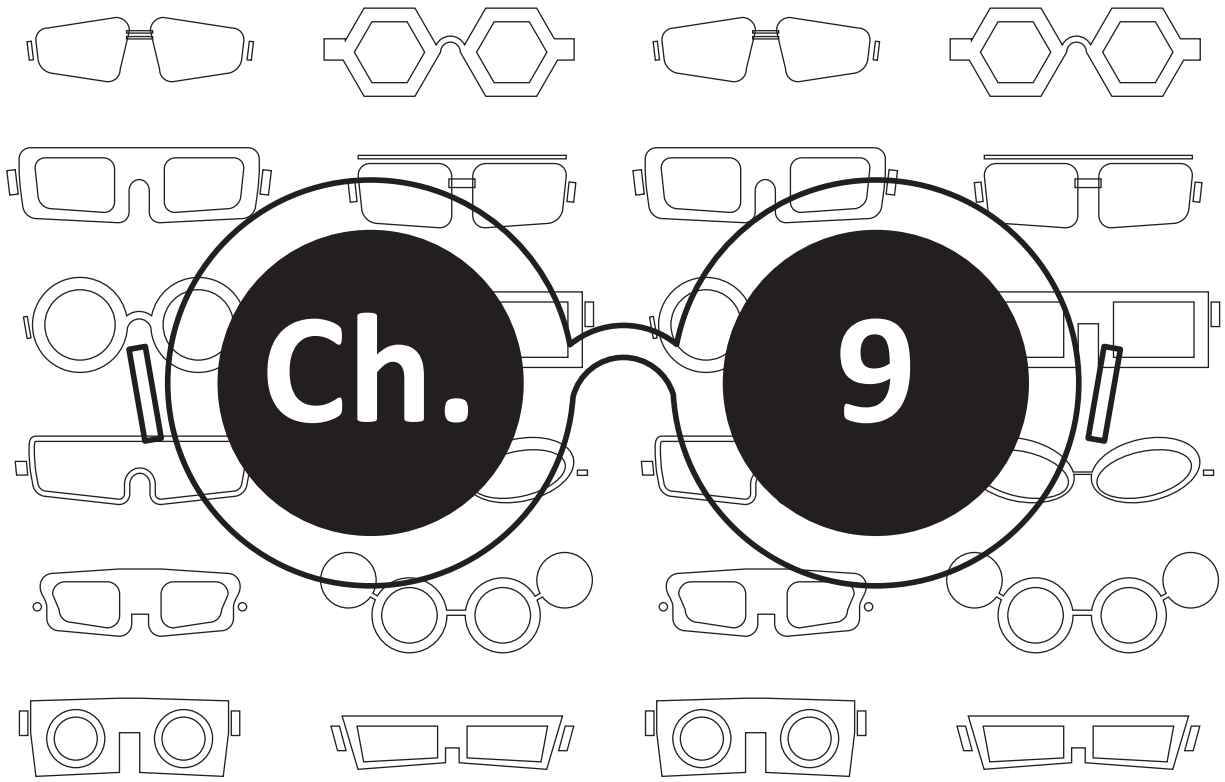


Different perspectives of clinicians and patients with severe mental illness on motivation for treatment

Jochems, E. C., van Dam, A., Duivenvoorden, H. J., Scheffer, S.C.M., van der Feltz-Cornelis, C.M. & Mulder, C. L. 2015. Different perspectives of clinicians and patients with severe mental illness on motivation for treatment. Clinical Psychology and Psychotherapy, Article first published online: 22 JUL 2015, DOI: 10.1002/cpp.1971.



Objective

It was investigated to which extent clinicians of patients with severe mental illness (SMI) were able to estimate their patient's perspective on motivation for engaging in treatment, to which extent they agreed on the patient's motivation, and which factors were associated with estimation and agreement on treatment motivation.

Methods

Motivation for engaging in treatment as rated by clinicians (N=57) and patients with severe mental illness (SMI, N=294) was assessed using measures based on three different motivation theories. Questionnaires were derived from Self-Determination Theory, the Trans Theoretical Model and the Integral Model of treatment motivation.

Results

It was found that clinicians were poorly to moderately capable of estimating their patient's type of motivation and readiness for change. Further, agreement on the level of motivation between patients and clinicians was moderate. These findings were consistent across diagnostic groups (psychotic disorders and personality disorders). A higher quality therapeutic relationship was generally associated with higher clinician-rated motivation. The patient's ethnicity and socially desirable responding were factors that differentiated between scales of different motivation theories.

Conclusion

Patients with SMI and their clinicians have different perceptions on the patient's motivation for engaging in psychiatric treatment, regardless of the theoretical framework that is used to measure motivation. The findings imply that a negotiated approach is needed where both perceptions of clinicians and patients on motivation for treatment are considered to ensure effective mental health interventions.

Introduction

The patient's motivation for engaging in treatment is seen as a core determinant of treatment adherence and outcomes [29,37,65]. In the treatment of patients with severe mental illness (SMI) such as those with psychotic disorders and personality disorders, impairment in and lack of motivation for engaging in treatment is known to negatively impact psychosocial outcomes [66,107,214]. Assessing the patient's motivation for engaging in treatment is the first step towards adequately addressing possible motivational problems, but such assessment is not straightforward.

Firstly, there is the issue of how and who should do the motivational assessment (e.g. patient, an independent observer or a clinician). The use of self-report measures on motivation in patients with schizophrenia spectrum disorders is gaining momentum [68,70,261], yet the measures currently being used in such studies have been validated with measures of other psychological constructs or other self-rated motivation measures rather than with clinician-rated or observer-rated measures of motivation. Previous studies have found that the self-report on domains of functioning that are less readily accessible such as negative symptoms, certain aspects of delusionality, and deficit symptoms are problematic for patients with schizophrenia spectrum disorders [262,263], which may also be the case for motivation. Further, it is unclear how for example, patient's insight into illness [264] or socially desirable responding [265,266] influence self-reported motivation in patients with SMI. Observer-ratings may instead be used to avoid these issues, but clinician ratings for example can be time-consuming, costly, and prone to observer bias [267]. In non-SMI patient populations, studies found low to moderate agreement between patients and clinicians on motivation for treatment [93,160,268], but there is a lack of empirical research into the agreement between patients with SMI and clinicians on motivation for treatment. Although one recent study found no statistically significant associations between an interviewer-rated measure of motivation and self-reported motivation in patients with schizophrenia spectrum disorders [269], it was unclear whether this finding should be ascribed to differences between raters or differences between instruments. This suggests a need for more empirical research in patients with SMI to enable a better understanding of their motivation for engaging in treatment, including factors that may affect the way patients and clinicians view the patient's motivation. To gain insight in whether the level of agreement on motivation for treatment is specific to schizophrenia spectrum disorders, it would be relevant to compare agreement between patients with different psychiatric disorders. For example, patients with personality disorders are also typically regarded as problematic regarding their motivation for engaging in treatment, yet have also been understudied in this respect [228].

Secondly, the definition and measurement of motivation for engaging in treatment depends on the underlying theoretical framework. There is not one single widely accepted model but rather there are many models each explaining different aspects of the concept [37,86]. Distinct - but not incompatible - definitions of motivation are provided by prominent theories such as Self-Determination Theory [48,82], the Transtheoretical Model [44,54], Expectancy-Value Theory [270] and derivatives of these models such as the Integral Model of treatment motivation [37]. Some of these theories were developed specifically within treatment contexts, whereas others constitute more generalized motivation theories. *Self-Determination Theory (SDT)* [48,82] represents a broad framework for human motivation and considers different types of motivation along a continuum of self-determination from most self-determined (i.e. intrinsic motivation) to least self-determined (extrinsic motivation)[64,82]. Several studies have found support for SDT's motivation continuum in the context of mental health care [65,128,210,215] yet to date very little studies have specifically been performed on motivation for treatment in SMI patients [218]. The *Transtheoretical Model (TTM)* [44,83] asserts that individuals move through certain stages in the process of behavior change, and acknowledges that relapse is common in the change process. The TTM is typically regarded as a model for motivation for change, as the motivation or readiness to engage in behavior change increases with each progressive stage [37,86]. The TTM has frequently been used as a basis for the development of health behavior interventions, especially in the field of addictions where it was originally developed [38,44] and in patient populations with co-occurring psychiatric and substance abuse problems [57,102,271]. *The Integral Model of Treatment Motivation (IM)* [37,118] postulates six predictors of the patient's motivation to engage in treatment (MET). This model resembles expectancy-value theory (EVT) [270] and the theory of planned behavior (TPB) [45] in its emphasis on the focus on individual beliefs, subjective norms and self-efficacy as essential predictors of motivation and behavior. IM was specifically developed for the assessment of motivation for engaging in treatment in forensic psychiatry. The patient's perceived suitability of treatment and outcome expectancy were found to be important predictors of motivation

and treatment engagement in forensic outpatients [116,117]. Although all these theories may have utility in the psychiatric treatment of patients with severe mental illness [37,73,86,272], there appears to be a paucity of research regarding the differences between patient and clinician perspectives on motivation for engaging in treatment across different theoretical perspectives [86] .

Aims of the study

The current empirical study aimed to investigate the association between patient- and clinician-ratings on motivation for engaging in treatment, using measures of motivation based on SDT, TTM and IM. A distinction was made between the level of accuracy by which a clinician was able to estimate their patient's report of motivation for treatment (which we labeled as 'accuracy of estimation') versus the level of agreement between patients and clinicians on the patient's motivation (which we labeled as 'agreement'). This enabled to study to which extent clinicians were able to take the patient's perspective ('accuracy of estimation') and to which extent the opinion of the clinician regarding the patient's motivation was in line with the patient's self-reported motivation ('agreement').

Further, it was explored which patient- and clinician characteristics were related to differences in ratings between patients and clinicians on the patient's motivation. Considering the exploratory nature of the current study, we decided to incorporate a large number of covariables. Some covariables such as age, gender, type of psychopathology, social functioning, impairments and behavioural problems were shown in other studies of self-other agreement to relate to differences between raters [273,274]. Other covariables were chosen because they have previously been related to treatment motivation in patients with SMI and can thus be considered as 'information sources' that clinicians and patients may use differentially in their ratings of motivation[68,107,218].

Methods

Participants and procedures

The data for the current cross-sectional study were obtained from the baseline assessments in a cluster randomized controlled trial [197]. A total of 12 outpatient treatment programs, including a forensic psychiatric outpatient clinic, specialized psychotic outpatient treatment programs and several function-assertive community treatment teams (FACT-teams [14]) were approached for participation at two Dutch treatment centers: the Western North Brabant Mental Health Center and the Breburg Mental Health Center. As the name indicates, FACT-teams provide assertive, outreaching, community-based, and supportive psychiatric services to individuals with SMI [14]. Since patients with psychotic disorders constitute the majority of patients treated in FACT-teams in the Netherlands [14] and patients with severe personality disorders constitute another significant part of the caseload, it was decided to incorporate both patient groups into the study.

Inclusion criteria for patients were: a primary diagnosis of psychotic or personality disorder, aged 18 to 65 years, undergoing individual outpatient treatment and having a sufficient command of the Dutch language. A clinician was eligible for participation if he or she was the primary health care provider involved with the patient and saw the patient most frequently. Eligible patients on the clinicians' caseload lists were approached and informed by researchers and asked for their signed consent. To enhance the likelihood of participation, patients were given an incentive of 15 euro for participating. This procedure was approved by a medical ethical committee (trial number NTR2968).

Measures

Motivation

The motivation constructs described by SDT were assessed with the Treatment Entry Questionnaire (TEQ) [126], which measures three types of treatment motivation: identified, introjected and external motivation [126,198]. Identified motivation is evident if a patient fully recognizes and accepts that treatment is useful for achieving personally relevant goals [65]. An example item is 'I plan to go through with a treatment program because I have freely chosen to be here'. A less self-determined type of motivation is introjected motivation, which is evident when a patient is driven by feelings of guilt, shame or anxiety, and might feel ashamed or disappointed if he does not remain in treatment. An example item is 'I plan to go through with treatment because I'll be ashamed of myself if I don't'. External motivation is evident when a patient feels pressured or even forced to engage in treatment, for example by the legal system [65]. An example item is 'I have agreed to follow a treatment program because I was pressured to come'. Items and response scales for the TEQ were identical for patients and clinicians, which included 18 items rated on a scale from 1 (strongly disagree) to 7 (strongly agree), and subscale scores are computed by averaging the item scores. Higher scores reflect greater motivation. Reliabilities were acceptable for all scales in both versions (Cronbach's αs varied from 0.72 to 0.87). Validity of the Dutch TEQ was supported by significant associations with clinician-rated treatment engagement ($r = 0.25$ to 0.58 ($p<0.01$)

depending on the method of assessment) and with legally mandated treatment [218]. Clinicians were asked to indicate how they thought patients responded to the items. As such, differences between patients and clinicians were interpreted as reflecting inaccurate estimates by the clinician of the patient's motivation for engaging in treatment.

The stages of change described by the TTM were assessed using the Dutch version of the University of Rhode Island Change Assessment (URICA-D) [170], a self-report scale that asks a patient to rate the agreement with a particular statement reflecting one of four stages of change: precontemplation, contemplation, action and maintenance. Example items are 'As far as I'm concerned, I don't have any problems that need changing'[precontemplation], 'I have a problem and I really think I should work on it'[contemplation], 'I am doing something about the problems that had been bothering me' [action] and 'It worries me that I might slip back on a problem I have already changed so I am here to seek help'[maintenance]. It consists of 24 items rated on a scale from 1 (*totally disagree*) to 5 (*totally agree*). A total readiness for change score was calculated by subtracting the precontemplation scale score from the sum of the other three scale scores. This readiness to change score was used in previous studies in patients with SMI where the alpha coefficient was estimated at 0.91 [57,275]. Higher scores reflect more readiness to change. In this study, items and response scales for the URICA-D were identical for patients (Cronbach's α = 0.76) and clinicians (Cronbach's α = 0.80), and clinicians were asked to indicate how they thought patients responded to the items. As such, differences between patients and clinicians were interpreted as reflecting inaccurate estimates by the clinician of the patient's motivation for engaging in behavior change.

To assess motivation according to the IM, patients were administered the subscale for motivation to engage in treatment (MET) from the Treatment Motivation Scale for forensic patients (TMS-f) [116,118]. The items on the MET-subscale are considered sufficiently general for use outside a forensic setting [218]. There is a patient version and a therapist version, but number of items, wording of items and response scales for the TMS-f patient- and clinician versions were not identical. The patient version consists of 16 items rated on a scale from 1 (strongly agree) to 5 (strongly disagree) (Cronbach's α = 0.83), the therapist version comprises 5 items rated on a scale from 1 (not) to 5 (strongly) (Cronbach's α = 0.86) and scale scores are derived by averaging the individual items. In both versions, higher scale scores reflect greater motivation. The MET-scale addresses the patient's commitment to treatment, readiness for disclosure and readiness for efforts between sessions. Example items are 'If I don't see progress for several weeks, my engagement in treatment would probably decrease' and 'At home I wish to distance myself from treatment and not be engaged with it'. As clinicians are asked to rate their patient's motivation, differences between patient reports and clinician reports will be interpreted as reflecting disagreement.

Covariables

Socio-demographic information was requested from the patient. Clinician characteristics were obtained from the clinicians. Treatment characteristics, including patient diagnoses as made by the psychiatrist of the team, were obtained from the medical record.

The patient's current psychosocial functioning was assessed with the Health of the Nations Outcome Scales (HoNOS) [163,164], which was administered as a semi-structured interview with the patient, and scored by trained research assistants who were not involved with the patient's treatment. It contains 12 items that refer to behavioral problems (e.g. aggression and self-destructive behavior); symptoms (e.g. delusions, hallucinations, depression and anxiety); limitations (e.g. cognitive and physical impairments); and social functioning (e.g. frequency of social interactions, daily functioning and living conditions). All HoNOS items refer to the previous two weeks. Items are scored on a 5-point Likert scale from 0 (no problem) to 4 (severe problem), such that higher scores denote more problems. The total score is computed by summing the items. In the current study, Cronbach's α for the total scale was 0.73. The HoNOS total score was found to be a valid, reliable summary measure of (changes in) functioning [163,164,276].

The patient's executive functioning was assessed using the Zoo Map test, a subtest of the Behavioural Assessment of Executive Functioning (BADS) [179,180]. The Zoo Map test asks the patient to draw a route on a map of a zoo, and to visit specific sites while applying specific rules (e.g. 'you can use the dotted pathways as often as you want, but the white pathways only once'). A total score ranging from 0 to 4 is derived, with higher scores denoting higher levels of executive functioning. The BADS has shown adequate validity in heterogeneous patient samples as evidenced by associations with other neuropsychological tests that assess planning functions [180,181,277].

Social desirable responses were assessed using the 15-item social desirability scale from the TMS-f

[118], whose items reflect endorsement of behaviors that are culturally sanctioned and approved but also improbable, such as "I have never deliberately said anything that might have hurt another person's feelings". A higher score on this scale reflects a higher tendency to give socially desirable responses. The scale was found to have adequate reliability (Cronbach's α = 0.80) and construct validity was supported in a study with forensic psychiatric patients [160].

Treatment engagement behavior was rated by clinicians using the Service Engagement Scale (SES) [199]. The SES covers four facets of service engagement: availability, collaboration, help-seeking and treatment engagement (including medication adherence). A total score was calculated, where higher values denote higher levels of treatment engagement. For patients who were not prescribed medications, the subscale for treatment engagement was computed by taking the mean of all other items as substitutes for the medication items. The SES total scale score was used in several studies with SMI patients [190,199,278], Cronbach's alpha in the current study was 0.86.

The therapeutic relationship was measured with the Helping Alliance Questionnaire (HAQ), which was previously validated in a sample of Dutch substance-dependent patients [182]. Both a patient and a clinician version have been developed. The HAQ therapist version (22 items) was used since the patient version showed extremely skewed distributions signifying a ceiling effect. The therapist version consists of 2 parts, the first consisting of the clinician's perception of the relationship, and the second asking the clinician how - according to him - the client perceives the relationship. The items are rated on a 5-point scale (*completely disagree* to *completely agree*). A higher score implies a better quality of the therapeutic relationship. In the current study, the total scale score of the 22 items was used as measure for the therapeutic relationship (Cronbach's α = 0.94).

Statistical analyses

Multilevel linear regression analyses were performed for the total sample and for diagnostic groups separately to estimate associations between patient-rated and clinician-rated scale scores, adjusted for clustering of patients within clinicians. Interaction analyses were used (clinician-rating by diagnostic group) to assess whether the clinician's agreement with the patient was different for the two diagnostic patient groups. Subsequently, we standardized all scales for both patients and clinicians in that they had a mean of 0 and SD of 1. This was done because for the MET-scale, the raw scores on the motivation scales were not directly comparable between patients and clinicians. A difference score (D) was then computed by subtracting the standardized clinician score from the standardized patient score (i.e. patient minus clinician). This approach was previously reported by Dorz et al. [279] to study differences between patients and clinicians on symptoms of depression. To identify patient-clinician pairs where clinicians were in agreement with the patient on the patient's motivation for treatment (in case of the MET-scale) and pairs where clinicians were able to accurately estimate their patient's motivation (in case of the URICA and TEQ), we considered D-scores ≥ ± 0.5 SD from the mean as representing disagreement (in case of the MET) and inaccuracy (in case of the URICA and TEQ scales). All scores in between were considered as being in agreement (in case of the MET) and as accurate (in case of the URICA and TEQ). Thus, a positive difference score (D-score) indicates that clinicians regard the motivation to be low/underestimate relative to the patient report, whereas a negative D-score indicates that clinicians regard the motivation to be high/overestimate relative to the patient's score.

Multinomial multilevel regression models were used to explore which variables were significantly associated with the D-scores on all motivation scales. The outcome variables were the trichotomized D-scores; the reference category used in the analyses was ≥ 0.5 SD (underestimation by the clinician). Not all available levels (i.e. mental health institutions, teams, clinicians, patients) could simultaneously be included as random effects due to singularity problems. As patients were treated within teams where clinicians worked with shared caseloads, two levels were considered: patients (level one) and teams (level two). All models included clustering at team-level as a random effect. Missing data on predictor variables were not imputed; only all observed data was used . First, bivariate associations between predictor variables and D-scores were explored. Subsequently, any variable that was significantly associated with at least one D-score was retained in a final multiple multinomial regression where all predictors were entered simultaneously into the model. P-values (two-sided), odds ratios (ORs) and corresponding 95% confidence intervals (95%CIs) are reported. For the regression analyses, the glimmix procedure in SAS version 9.3 was used with the estimation method RSPL (corresponding to maximizing the residual log pseudo-likelihood with an expansion about the current solutions of the best linear unbiased predictors of the random effects[280].

Results

A total of 57 clinicians agreed to participate: 49 specialized psychiatric nurses (86%), 5 social workers (9%) and 3 psychologists (5%). They had a mean of 16.5 years of clinical experience (range = 1 to 40 years). Their mean age was 43.9 years (range = 25 to 62 years); 63% of them were female. From their caseloads, 294 patients agreed to participate out of 470 approached eligible patients (63%). Table 1 shows characteristics of the patient sample. Within the subsample of patients with psychotic disorders, the majority of patients were diagnosed with schizophrenia (48%), schizoaffective disorder (16%), or psychotic disorder not otherwise specified (24%). Within the subsample of personality disorders, 40% had a borderline personality disorder, 13% had antisocial personality disorder, and 26% had a personality disorder not otherwise specified.

Differences between patients and clinicians on the patient's motivation

Table 2 shows that three groups of about similar size were created that represented agreement/accuracy and over- and underestimation of treatment motivation, based on the D-scores. The accuracy by which clinicians were able to estimate patient ratings of motivation ranged from low for the introjected motivation scale (r = 0.21, 95%CI = 0.06 to 0.37, p<0.05) to moderate for the other motivation scales (e.g., r = 0.43, 95%CI = 0.30 to 0.55, p<0.01 for the URICA-D) in the total patient sample (see Table 2). Agreement between patients and clinicians on the level of motivation on the MET was moderate (r=0.31,p<0.05) in the total sample. Interaction analyses showed no statistically significant effect of diagnostic group on the level of agreement on any of the questionnaires, such that there were no significant differences between diagnostic groups on agreement with the clinician on motivation for treatment. The weakest (and only non-significant) association between patient- and clinician-ratings was found for introjected motivation in the subgroup of patients with primarily personality disorders.

Factors associated with agreement

Bivariate analyses

Bivariate associations between predictor variables, including socio-demographics, medical record information (e.g., primary psychiatric diagnosis, comorbid substance abuse problems and legally mandated treatment), clinical status (e.g., psycho-social functioning, quality of the therapeutic relationship and treatment engagement) and clinician characteristics (e.g. clinician sex and years of clinical experience) and the D-scores were explored (see Table 3). Regarding socio-demographics, the MET-scale (assessing agreement) differed from the URICA-D and TEQ scales (assessing accuracy of the clinician in estimating the patient's motivation)in that MET showed a higher number of significant associations with socio-demographics. For example, clinicians were more likely to report higher motivation on the MET for female patients compared to males (OR=2.47, 95%CI=1.30 to 4.67,p<0.01) and for those of higher educational level compared to those with lower educational levels (OR=2.35, 95%CI=1.01 to 5.53,p<0.05), whereas these variables were not associated with the accuracy of estimation on the URICA-D and TEQ scales. The therapeutic relationship was statistically significantly associated with all five motivation scales, such that for every higher level of the quality of the therapeutic relationship there was a 4% increase (OR=1.04,95%CI: 1.01 to 1.06,p<0.01 for introjected motivation) to 10% increase (OR=1.10, 95%CI:1.07 to 1.14,p<0.01 for readiness to change) in the odds of clinicians overestimating the patient's motivation for treatment, except for external motivation where a decrease in clinicians overestimating the external motivation was found in response to higher quality relationships (OR=0.97,95%CI=0.95 to 0.99,p<0.05). A similar pattern was found for the level of treatment engagement where higher levels of treatment engagement were associated with higher odds of agreement and higher clinician-rated motivation (e.g. OR=1.13,95%CI=1.08 to 1.19,p<0.01 for MET). Conversely, clinicians were around 70% less likely to overestimate motivation for patients with a comorbid substance abuse, as can be seen for MET (OR=0.26,95%CI=0.12 to 0.52,p<0.01), URICA-D (OR=0.28,95%CI=0.12 to 0.66) and TEQ identified motivation (OR=0.33,95%CI=0.15 to 0.7,p<0.01).

In sum, thirteen variables were statistically significantly associated with at least one D-score; patient sex, education level, ethnicity, primary diagnosis, comorbid substance abuse, legally mandated treatment, duration of current treatment, frequency of contacts, psychosocial functioning, therapeutic relationship, social desirability, treatment engagement and clinician sex. These variables were retained for subsequent multiple logistic multinomial regression analyses (see Table 4).

Multivariate analyses

Consistent with the bivariate associations, multivariate analyses showed that clinicians were over four times more likely to report higher scores than patients on the MET for patients of Dutch ethnicity (OR=4.82, 95%CI=1.73 to 13.39,p<0.01)

compared to those of non-Dutch ethnicity, but the patient's ethnicity was not associated with accuracy of estimation on the URICA-D or TEQ-scales. Further, it was found that clinicians were less likely to be in agreement or to report higher scores than their patients for patients who were more likely to respond in a socially desirable way (OR=0.93,95%CI = 0.88 to 0.98,p<0.01 and OR=0.89,95%CI = 0.84 to 0.94, p<0.01, respectively). Social desirability was not associated with the D-scores on the URICA-D and TEQ. The therapeutic relationship remained significantly associated with agreement on several scales, such that for patients whom clinicians had a higher quality therapeutic relationship with, clinicians were more likely to agree but also to overestimate motivation, except for external motivation.

Discussion

The current study shows that clinicians and patients with SMI have different perceptions on the patient's motivation for engaging in psychiatric treatment, and that the level of agreement is not different between patients with a primary diagnosis of a psychotic disorder or a personality disorder. Clinicians appear to be moderately capable of taking the patient's perspective (i.e. estimating how their patients would report) on readiness for change, identified and external motivation and poor ability in estimating introjected motivation for engaging in treatment. Further, in comparing opinions between patients and clinicians on the patient's motivation, we found moderate agreement on the level of motivation. These findings are in line with previous studies which found low to moderate agreement on motivation between patients and clinicians in other patient populations [93,116,268] and suggest that clinicians should be aware that patients with SMI generally have a different view on their motivation for engaging in treatment than the clinician can estimate or judge, regardless of the theoretical framework that is used to measure motivation. Thus, regarding the question of who should do the motivational assessment, the results suggest that it is not sufficient to assess either the patient or clinician view alone, but that it is necessary to take both perspectives into account. It is likely that the perceptions are complementary and that a combined view meets the clinical reality. A motivational assessment that explicitly incorporates both perspectives may be useful in clinical practice as it forces clinicians to evaluate potential differences between them and their patients. Such an explicit evaluation may help to increase the possibility that interventions are tailored to the patient's motivational perspective which in turn may increase the likelihood of treatment success. It should be noted that we chose to take the patient report as 'reference' in the current study to compare the clinician's perspective with, yet this does not imply that the patient perspective is 'the golden standard'. In fact, currently there is no golden standard in the assessment of treatment motivation which underlines the importance of more empirical studies in this domain. For example, it would be relevant to study which perspective (patient or clinician) is most predictive of treatment outcomes and whether better clinician-patient agreement predicts more favourable treatment outcomes.

Regarding the question whether the level of agreement between patients and clinicians depends on the theoretical framework that is chosen, the results suggest that the degree to which patients and clinicians differed on the motivation questionnaires did not differ substantially between the different motivational theories. If anything, clinicians had most difficulty with estimating their patient's introjected motivation for treatment, which revolves around the patient's experience of engaging in treatment "*because of 'shoulds', guilt, or seeking social approval"* (p. 187)[65]. Such motivation is presumably less observable and perhaps less often discussed between patients and clinicians which may result in more difficulties for clinicians in estimating it. SDT thus provides a potentially useful framework for exploring potentially unknown sources of motivation of a patient [48,67]. On the other hand, depending on the specific purpose of the motivational assessment, a patient's readiness to change or overall level of motivation may be clinically relevant to explore, which would make TTM or IM appropriate frameworks for assessment, respectively. All in all, it appears that the level of agreement between patients and clinicians is unsuited to use as a criterion for choosing a motivational assessment based on a certain theory, as neither of the three theories stood out from the other theories in this regard. Other criteria such as the type of information that can be derived from the different questionnaires may be used instead to guide assessment choices.

The different perspectives between patients and clinicians were associated with several factors. We found that the therapeutic relationship was associated with both agreement and accuracy across all motivation scales, such that the higher the clinician rated the quality of the relationship, the more likely that the clinician attributed higher scores to the patient's motivation than patients themselves (except external motivation, where a

Table 1. Patient characteristics

	Total patient sample N = 294	Psychotic disorder N = 199	Personality disorder N = 95
Age, mean (sd)	44.00 (10.3)	43.0 (10.2)	46.0 (10.2)
Male gender, n (%)	179 (60.9)	133 (66.2)	46 (50.0)
Dutch ethnicity, n (%)	208 (70.7)	140 (70.4)	68 (71.6)
Education level, n (%)			
- No education/elementary	108 (36.7)	76 (38.2)	32 (33.7)
- Secondary school	124 (42.2)	75 (37.7)	49 (51.6)
- ≥Upper high school	59 (20.1)	47 (23.6)	12 (12.6)
Living situation, n (%)			
- Alone	147 (50.0)	96 (48.2)	51 (53.7)
- With partner and/or kids	119 (40.5)	80 (40.2)	39 (41.1)
- Mental health centre facility	26 (8.8)	21 (10.6)	5 (5.3)
- Homeless	2 (0.7)	2 (1.0)	0 (0)
Comorbid substance use problems, n (% yes)	74 (25.2)	42 (21.2)	32 (33.7)
Prescribed medication, n (%)			
- Classical antipsychotics	63 (21.4)	47 (23.6)	16 (16.8)
- Atypical antipsychotics	130 (44.2)	113 (56.8)	18 (18.9)
- Combination of typical and atypical	27 (9.2)	19 (9.5)	8 (8.4)
- Benzodiazepines	81 (27.6)	55 (27.6)	26 (27.4)
- Antidepressants[A]	93 (31.6)	52 (26.1)	42 (44.2)
Age of first contact with mental health, mean (sd)	26.06 (10.3)	26.47 (9.8)	25.2 (11.4)
One or more previous hospitalizations, n (% yes)	227 (77.2)	162 (80.6)	65 (70.7)
Legal mandate, n (% yes)	24 (8.2)	13 (6.5)	11 (12.0)
Executive functioning, mean (sd)	2.1 (1.1)	2.0 (1.1)	2.1 (1.1)
Psychosocial functioning, median (IQR)	9.0 (6.0 to 13.0)	8.0 (5.0 to 12.0)	11.0 (8.0 to 15.0)

Table 2. Associations between patient- and clinician ratings for the different motivation questionnaires

Scale	Sample	Patient Mean (sd)	Clinician Mean (sd)	β (95% CI)	Agreement[a] n (%)	Clinician underestimates[a] n (%)	Clinician overestimates[a] n (%)
Readiness to Change (URICA-D)	Total	8.84 (2.28)	7.91 (1.99)	0.43** (0.30 to 0.55)	110 (37.4)	81 (27.6)	80 (27.2)
	Pers	9.58 (1.92)	8.30 (1.64)	0.36** (0.12 to 0.59)	35 (37.2)	33 (35.1)	23 (24.5)
	Psych	8.48 (2.36)	7.74 (2.11)	0.41** (0.26 to 0.57)	75 (37.5)	48 (24.0)	57 (28.5)
Identified motivation (TEQ)	Total	33.88 (7.31)	29.57 (6.83)	0.41** (0.29 to 0.53)	110 (37.4)	85 (28.9)	82 (27.9)
	Pers	35.06 (6.10)	30.44 (5.67)	0.30** (0.09 to 0.51)	38 (40.4)	29 (30.9)	23 (24.5)
	Psych	33.34 (7.77)	29.17 (7.30)	0.44** (0.30 to 0.58)	72 (36.0)	56 (28.0)	59 (29.5)
Introjected motivation (TEQ)	Total	22.63 (9.37)	21.13 (7.11)	0.21* (0.06 to 0.37)	99 (33.7)	95 (32.3)	83 (28.2)
	Pers	23.63 (9.17)	22.69 (7.41)	0.10 (-0.16 to 0.37)	33 (35.1)	28 (29.8)	29 (30.9)
	Psych	22.16 (9.45)	20.43 (6.88)	0.25* (0.05 to 0.44)	66 (33.0)	67 (33.5)	54 (27.0)
External motivation (TEQ)	Total	17.24 (8.41)	20.24 (7.76)	0.32** (0.20 to 0.45)	110 (37.4)	89 (30.3)	78 (26.5)
	Pers	14.70 (7.95)	18.67 (8.33)	0.33** (0.14 to 0.53)	43 (45.7)	23 (24.5)	24 (25.5)
	Psych	18.42 (8.37)	21.04 (7.36)	0.28** (0.12 to 0.43)	67 (33.5)	66 (33.0)	54 (27.0)
Motivation to Engage in Treatment (MET)	Total	2.95 (0.73)	3.70 (0.78)	0.31** (0.21 to 0.42)	104 (35.4)	78 (26.5)	93 (31.6)
	Pers	2.94 (0.75)	3.67 (0.72)	0.34** (0.13 to 0.55)	34 (36.2)	28 (29.8)	29 (30.9)
	Psych	2.95 (0.72)	3.71 (0.81)	0.29** (0.17 to 0.42)	70 (35.0)	50 (25.0)	64 (32.0)

*p<0.05 **p<0.01 (two-tailed). URICA-D = University of Rhode Island Change Assessment-Dutch, TEQ = Treatment Entry Questionnaire, MET = motivation to engage in treatment scale, Psych = psychotic disorders, Pers = personality disorders.

[a] D-scores were computed as standardized patient score minus standardized clinician score. D-scores ≥ 0.5 SD were considered as the clinician reporting lower scores than the patient (i.e. underestimation), D-scores ≤ 0.5 SD as the clinician reporting higher scores than the patient (i.e. overestimation) and all scores in between as being in agreement. Numbers may not sum to total sample size due to missing data.

reverse relationship was found). Considering the quality of the therapeutic relationship as a reflection of the communication patterns between patients and clinicians, it is not surprising that a better relationship is associated with more agreement and higher motivation for engaging in treatment. Alternatively, these findings might be ascribed to the tendency of clinicians to provide consistent ratings based on a global positive (or negative) evaluation of the patient, instead of assessing distinct constructs separately, which is known as halo bias [160,281]. That is, clinicians may rate patients higher in their motivation

because they feel the relationship is good, whereas these concepts are distinct and may go in different directions. For example, a patient may be motivated to engage in social contact with the clinician while at the same time may not be motivated for engaging in treatment-related behaviors.

Further, the patient's ethnicity and socially desirable responding were factors that differentiated between different motivation scales. When asked to give their own opinion about the patient's motivation on the MET-scale, clinicians reported higher motivation for patients of Dutch ethnicity compared to those of non-Dutch ethnicity, and clinicians were less likely to overrate motivation in patients who responded in a more socially desirable way. At the same time, ethnicity and socially desirable responding were not associated with the difference scores on the URICA-D and TEQ, which may be related to the fact that clinicians were asked to estimate motivation from the patient's perspective on these scales. These findings may reflect that clinicians were able to take the patients' socially desirable responding and ethnicity into account when estimating their patient's report on readiness to change (URICA-D) and types of motivation (TEQ), while at the same time, clinicians were also more likely to disagree with patients with such characteristics (MET). It is not surprising that patients who are more likely to respond in socially desirable ways rate themselves as having higher levels of motivation compared to their clinicians. The finding that clinicians more often disagree with patients of non-Dutch ethnicity (i.e. clinicians are less likely to overrate motivation for these patients), may be related to problems in communication or the therapeutic relationship which have been found to be more prevalent for ethnic minority patients [282,283].

Limiting the results of the current study, is that the patients in the research sample showed relatively high levels of motivation and psychosocial functioning, considering the range of scores. This may reflect that the current study was not successful at recruiting SMI patients with substantial problems in their motivation for engaging in treatment, suggesting ceiling effects and possibly a selection bias towards patients who were already relatively highly motivated for engaging in treatment and functioned at a relatively high level. Thus, the findings of the current study may not be generalizable to the total SMI outpatient population. Another limitation of the current study is that the MET asked a different question to clinicians (i.e. to give a rating of motivation) than the URICA-D and TEQ (i.e. to estimate motivation from the patient's perspective). We did not assess both types of questions for all five instruments of motivation, as administering all five motivation scales twice to the clinicians (i.e. once for 'agreement' and once for 'accuracy') was considered too burdensome and not feasible. Further, it should be noted that both the URICA-D and TEQ were developed as patient self-report questionnaires and their validity for clinicians might therefore be questionable, although previous work found preliminary support for the validity of the clinician-rated TEQ in the form of statistically significant moderate to strong correlations with treatment engagement and therapeutic alliance[218]. Our choice of these questionnaires lay in the absence of validated questionnaires for clinician-rated motivation for treatment. Finally, as the current study used medical records to obtain patient diagnoses instead of with structured clinical interviews, this limited our ability to comprehensively examine differences between different diagnostic groups of patients.

Research questions that remain include the identification of possible moderators of agreement between patients and clinicians, differences between diagnostic groups, and the determinants of agreement and accuracy over the course of treatment. In line with the broadly accepted use of the HoNOS total scale score in both research and practice [276], the current study chose to use this summary measure of functioning as predictor of motivation reporting. However, future studies might also look at separate domains of psychosocial functioning (e.g. social or cognitive functioning), as these might be differentially related to (reporting of) motivation. Further, it could be insightful to investigate the use of more dynamic clinician characteristics, such as mood and symptoms of burn-out [284], and address the question of how clinician-patient acquaintance and clinician discipline are related to differences scores, as the current study was not able to address this appropriately. For example, different (kinds of) clinicians might be differentially "close" to patients in knowing their motivation and thus relatively better in rating the patient's motivation. Although we assessed clinicians who had most frequent contact with the patient and could therefore be viewed as "most close" to the patient, future studies could address this by adding assessments of such variations in "closeness" or acquaintance.

Strengths of the current study include the inclusion of three theories of motivation, multiple methods of assessing motivation for engaging in treatment and the implementation of this study in everyday practice of the community mental health teams using a real-life heterogeneous patient population. The simultaneous exploration of three theories in the same patient population is fairly

Table 3. Bivariate associations between variables and agreement for five different motivation scales

Outcome:	Motivation to engage in treatment (MET)		Readiness to Change (URICA-D)		Identified motivation (TEQ)		Introjected motivation (TEQ)		External motivation (TEQ)	
Variables[1]:	Under vs agree[a]	Under vs over[b]	Under vs agree[a]	Under vs over[b]	Under vs agree[a]	Under vs over[b]	Under vs agree[a]	Under vs over[b]	Under vs agree[a]	Under vs over[b]
Female sex	1.24	**2.47***	0.95	1.22	1.63	1.43	1.07	0.98	1.33	0.72
Patient age	1.00	1.00	1.00	0.99	0.98	0.98	1.00	0.99	1.00	1.00
Higher education	1.89	**2.35***	0.92	1.35	2.98	2.92	0.99	0.63	0.88	0.57
Dutch ethnicity	1.59	**3.30***	0.95	1.06	1.00	1.01	0.89	0.71	1.20	0.66
Living alone	1.08	0.97	1.19	1.00	1.10	0.98	0.89	1.21	0.87	0.98
Psychotic disorder	1.16	1.10	1.47	1.58	0.98	1.37	0.79	0.78	**0.54***	0.78
Comorbid substance abuse	**0.33***	**0.26***	1.02	**0.28***	0.76	**0.33***	0.98	0.80	1.87	2.03
Legally mandated treatment	0.66	0.37	0.80	**0.19***	**0.29***	0.40	2.77	0.88	1.88	2.77
Age of first contact with mental health services	1.00	0.97	1.00	1.01	0.98	1.00	1.02	0.99	**0.97***	1.00
Previous admissions										
Missed appointments	1.30	0.84	1.46	0.62	0.89	0.71	1.22	1.12	1.26	1.44
Duration of current treatment	0.72	**0.54***	0.71	0.64	1.09	0.73	1.46	1.65	1.00	0.93
Frequency of contacts	1.00	1.00	1.00	1.01	1.00	1.01	1.00	1.01	**1.01***	1.00
	1.32	1.20	0.97	1.24	0.89	**1.39***	1.07	1.19	0.75	0.76
Psychosocial functioning	**0.91***	**0.94***	0.96	**0.89***	1.00	0.97	0.96	**0.95***	1.00	1.01
Therapeutic relationship	**1.04***	**1.08***	**1.06***	**1.10***	**1.05***	**1.07***	1.02	**1.04***	1.00	**0.97***
Social desirability	0.96	**0.94***	1.00	1.03	0.99	1.00	1.02	**1.05***	0.98	1.01
Treatment engagement	**1.07***	**1.13***	1.10	1.13	**1.06***	**1.07***	1.01	**1.05***	0.99	0.96
Executive functioning	0.96	0.92	1.08	1.07	1.12	1.06	1.10	**1.38***	1.14	1.21
Clinician female sex	0.77	1.15	**0.26***	**0.24***	0.94	0.68	0.80	1.04	1.31	1.06
Clinician years of clinical working experience	1.02	1.02	1.00	1.00	1.00	1.00	0.99	0.97	1.02	1.00

[1] Numbers represent odds ratios, adjusted for clustering at team level. *p<0.05 (two-tailed).

[A] Clinicians who rate lower than their patient's treatment motivation are compared to clinicians in agreement with their patient's report (the first being the reference category).

[B] Clinicians who rate lower than their patient's treatment motivation are compared to clinicians who rate higher than their patient's report (the first being the reference category).

Table 4. Outcomes of the multivariate logistic regression models for agreement on five different motivation scales

Outcome:	Motivation to engage in treatment (MET)		Readiness to Change (URICA-D)		Identified motivation (TEQ)		Introjected motivation (TEQ)		External motivation (TEQ)	
Variables[1]:	Under vs agree[a]	Under vs over[b]	Under vs agree[a]	Under vs over[b]	Under vs agree[a]	Under vs over[b]	Under vs agree[a]	Under vs over[b]	Under vs agree[a]	Under vs over[b]
Female sex	1.07	1.83	1.26	1.24	1.38	1.42	1.06	0.74	1.47	0.90
Higher education	1.32	1.70	0.61	0.79	**3.04***	2.58	0.86	0.54	0.80	0.55
Dutch ethnicity	1.41	**4.82***	1.00	1.13	0.88	0.78	0.87	0.52	1.12	0.61
Psychotic disorder	1.27	1.77	1.77	2.52	1.00	1.86	0.90	0.76	0.71	0.95
Comorbid substance abuse	0.43	0.37	1.96	0.70	0.82	0.54	1.48	1.13	2.22	1.85
Legally mandated treatment	0.77	1.08	0.77	0.17	**0.21***	0.45	2.45	1.31	1.69	2.40
Duration of current treatment	0.99	0.98	1.00	1.01	1.00	1.01	1.00	1.01	**1.02***	1.01
Frequency of contacts	1.14	1.26	0.98	1.22	0.91	1.45	1.03	1.08	**0.71***	0.73
Psychosocial functioning	0.95	**1.04***	0.99	0.96	**1.07***	1.06	0.95	0.97	0.94	0.97
Therapeutic relationship	**1.04***	**1.09***	**1.05***	**1.10***	**1.07***	**1.08***	**1.04***	**1.05***	1.01	0.97
Social desirability	**0.93***	**0.89***	0.98	0.99	0.99	0.98	1.01	1.04	0.99	1.02
Treatment engagement	1.01	**1.09***	1.05	0.98	1.01	0.96	0.97	1.00	0.97	1.00
Executive functioning	0.85	0.79	1.11	1.09	1.09	1.07	1.04	**1.49***	1.10	1.34
Clinician female sex	0.92	1.91	**0.19***	**0.15***	0.81	0.59	0.80	1.26	0.89	0.89

Numbers represent odds ratios, adjusted for clustering at clinician level and all other variables in the model. *p<0.05 (two-tailed).

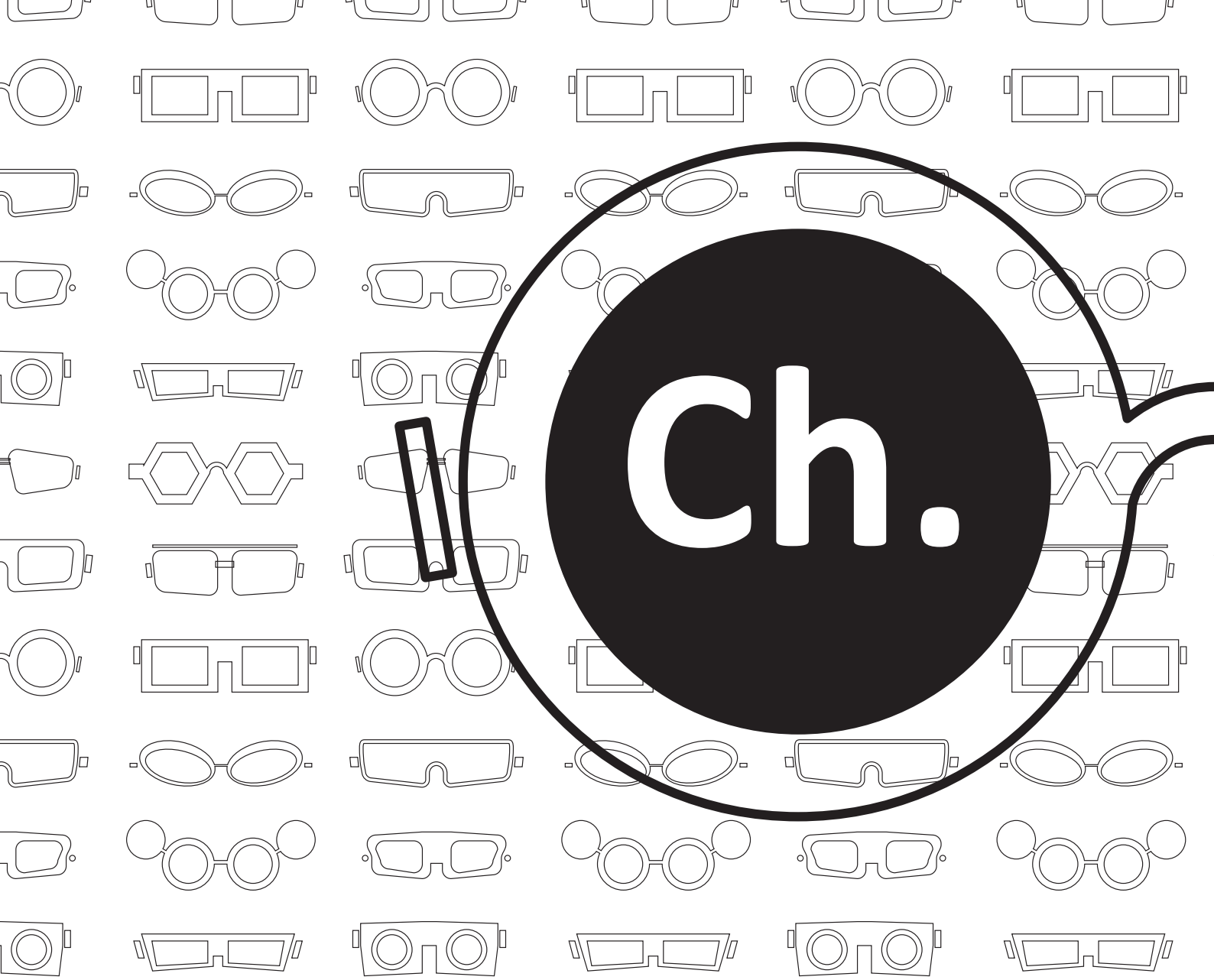
[1] All variables were entered simultaneously into the multilevel regression model.

[A] Clinicians who rate lower than their patient's treatment motivation are compared to clinicians in agreement with their patient's report (the first being the reference category).

[B] Clinicians who rate lower than their patient's treatment motivation are compared to clinicians who rate higher than their patient's report (the first being the reference category).

uncommon [75], while the comparisons between theories may help to advance what is currently known about interpersonal differences in treatment motivation and outcomes in severely mentally ill patients.

The current study underlines the importance of using multiple informants to assess motivation for psychiatric treatment in patients with SMI, and contributed to the knowledge base regarding assessment methods based on different motivation theories. Further research is needed to compare the motivational theories on other criteria, increase the knowledge concerning sources of disagreement and to investigate whether better clinician-patient agreement and more accurate assessment of the patient's motivation predict more favorable treatment outcomes.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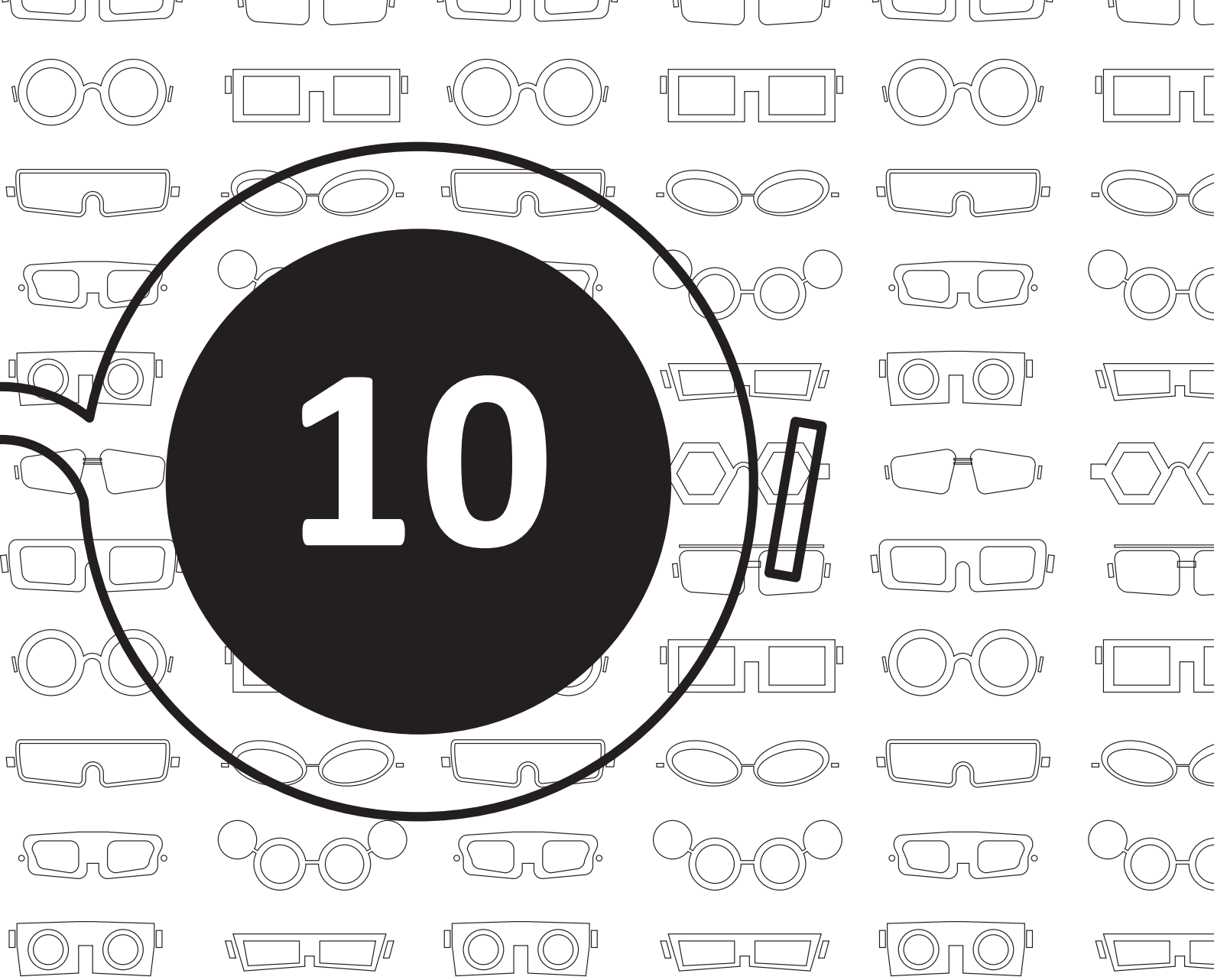
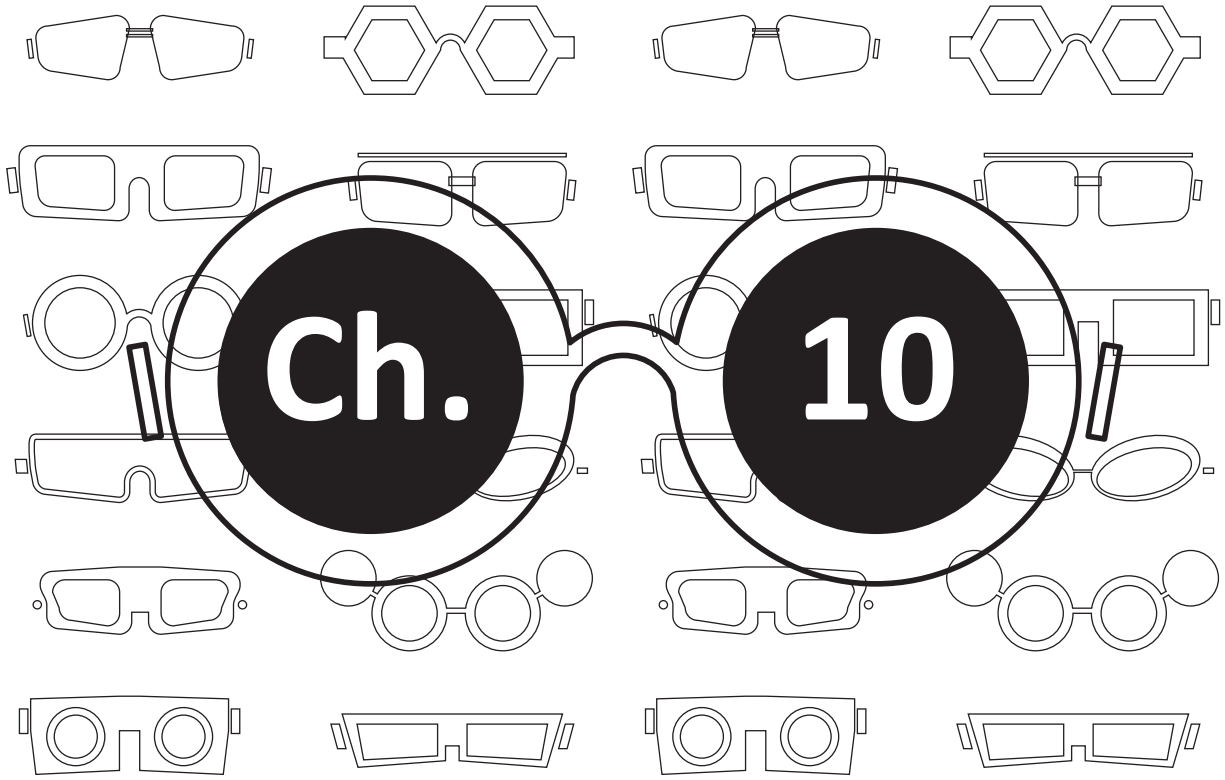


Summary and General Discussion



Aims and short summary of the findings

The main aim of the current thesis was to empirically test and compare three current theoretical models of motivation for treatment in the context of outpatient psychiatric care for patients with severe mental illness (SMI). In a literature review (Chapter 2), we argued that Self-Determination Theory (SDT)[64], the TransTheoretical Model (TTM)[44] and the Integral Model of Treatment Motivation (IM)[37] provided unique yet complementary frameworks that could be useful as the basis for health care interventions in outpatients with SMI. A cluster randomised controlled trial was designed (Chapter 3) to test whether a Motivation Feedback intervention was effective at improving treatment engagement and outcomes, and data from the trial were used to empirically test the three motivation theories.

As the testing of theories is founded on the proper assessment of theoretical constructs, assessment methods were first investigated. Using structural equation modelling, assessment instruments from SDT were found to be valid and reliable (Chapter 4). Subsequently, support was found for the hypotheses from SDT and the model was found to be stable across time and different diagnostic patient groups, and was able to explain 18% to 36% of variance in clinical outcomes (i.e. treatment engagement, psychosocial functioning and quality of life) (Chapter 5). Similar empirical tests were performed to evaluate the applicability of the IM (Chapter 6) and the TTM (Chapter 7). Although the assessment of motivation was found to be reliable for the IM, the basic hypotheses from IM were not supported, nor was the model similar across time and patient groups. The IM constructs did explain between 22% and 86% of variance in clinical outcomes, depending on the timing of the assessment. Regarding the TTM, two different assessment methods for the stages of change were found to show low convergence and partially showed the expected associations with other TTM constructs and with treatment engagement. The TTM stages of change explained 3% to 16% of variance in clinical outcomes.

Regarding the trial, it was expected that Motivation Feedback (MF) based on SDT, which was provided additional to treatment as usual (TAU), would induce more awareness regarding motivation for treatment and aid the internalization of the patient's motivation resulting in a higher level of treatment engagement, compared to TAU only. After one year of treatment, however, no differences between the intervention group and control group on treatment engagement, psychosocial functioning and quality of life were found (Chapter

8). An evaluation of internal validity, including non-response bias, information bias, implementation issues and differential effects between patients with psychotic disorders and personality disorders, largely explained why MF was not able to improve outcomes. Finally, it was found that the accuracy by which clinicians were able to estimate patient ratings of motivation ranged from low to moderate (Chapter 9). It is concluded that a negotiated approach on motivation is needed, yet the use of Motivation Feedback is insufficient to improve motivation and treatment engagement in patients with SMI.

Anna and Otto

Looking back, how does the research presented in this thesis regarding the three motivation theories relate to the cases of Anna and Otto as presented in the General Introduction? First of all, from the perspective of mental health care professionals, both cases presented with problems regarding motivation for engaging with treatment services and both cases raised questions regarding how the mental health care professionals (could have) approached these problems in order to help the patients achieve – at least partial - recovery from their mental health problems.

Regarding Anna, from the perspective of the **Integral Model of Treatment Motivation** it is plausible to assume that, although Anna was highly *distressed* and sought for help with Wilma, her motivation to engage with treatment may have been compromised by *low perceived suitability of treatment* and a *low outcome expectancy* due to several negative experiences with previous treatments. Although Wilma tried to address her distress and tried to build a relationship with Anna, Wilma gradually felt demotivated by the process. It is likely that Anna and Wilma had different perspectives on Anna's motivation for treatment (see Chapter 5), which may have led to ineffective motivational interventions. For example, Wilma explained the necessary conditions for effective psychotherapy to Anna, yet this may have raised the *perceived costs of treatment* which – combined with already low outcome expectancies – may have further compromised Anna's motivation. Perhaps, the approach taken by the assertive outreach team, differed from previous approaches in that it was perceived as more suitable and less costly by Anna, and was therefore more successful until now. Alternatively, taking a **Transtheoretical Model** perspective on this case, the timing of certain interventions is relevant. The previous attempts at engaging Anna in psychotherapy for her psychiatric problems, might be understood as failures to recognise the stage that Anna was in for each of her problems and to provide stage-matched interventions. For example, she might currently be in the maintenance stage for her alcohol abuse problems and in contemplation stage for her drug abuse problems. Finally, taking a **Self-Determination Theory** perspective, Anna is likely to have been deprived in her basic needs for autonomy, competence and relatedness which compromised her abilities to engage for a longer period of time with the offered services. For example, Anna explains how it took her a long time to build trust with the team and confidence in herself, which may reflect a deprivation of the needs for relatedness and competence, respectively. Similarly, Wilma may have experienced a lack of competence and relatedness in the therapeutic relationship with Anna over time, while also finding it difficult to stay autonomy supportive towards Anna. In light of this, the assertive outreach team may have found an approach that was more autonomy supportive and more supportive of her competence compared to previous approaches, for example by reaching out continuously and by providing individual placement and support.

Regarding Otto, the **Integral Model of Treatment Motivation** would argue that Otto does not recognize his psychiatric illness, as is frequently observed in patients with psychoses[176], which is one of the reasons why Otto feels that medication is not a suitable treatment for his problems. Also, Otto has experienced external pressure to engage with treatment as he has been hospitalized involuntarily, but this was so distressing that it has compromised his motivation for subsequent psychiatric treatment. It appears that Remco and his colleagues have thus addressed other determinants of motivation than the above, such that Otto accepted their help. From the perspective of **Self-Determination Theory**, it can be argued that the need for relatedness may have been helpful in establishing a relationship with Otto, while also providing support for autonomy in respecting his choice for not taking medication and by addressing issues that were important to Otto. Otto's motivation was likely external in nature from the start (i.e. by pressures from the housing association), yet seems to have internalized somewhat to a more introjected motivation towards Remco (i.e. a feeling of indebtedness). From the perspective of the **Transtheoretical Model**, Otto is in the precontemplation stage regarding the use of antipsychotic medication and Remco has provided a stage-matched intervention by only providing information about medication instead of offering (or pressuring) him the medication.

For both cases, it is relevant for clinicians to know which motivation theory provides the most plausible explanation of treatment engagement, and importantly, which interventions have the highest potential to be effective at improving the patients' (psychosocial) functioning and quality of life. The research as described in this thesis, provided some answers to these questions.

Reflecting on the three theories of motivation and their future

The use of any theory is founded on the reliability and validity of its theoretical constructs and the relationships between these constructs, as well as the ability of the framework to explain the phenomena it intends to describe[75,285,286]. More specifically, it has been argued that, when theories have the purpose to inform the design of effective interventions, they are perceived as 'good' theories when they: *"…include constructs that are clearly defined and used consistently, are not clearly falsified by existing observations, explain the major observations in a parsimonious, coherent, and comprehensible narrative, and make predictions that can be tested through observation."* (p. 582)[285]. In line with this, the three motivation theories that were empirically tested in the current research project in the context of outpatient psychiatric treatment for patients with SMI, were evaluated according to the internal consistency and validity of their constructs, the plausibility of their proposed framework, the robustness of their proposed framework over time and different patient diagnostic groups and their ability to predict treatment engagement and clinical outcomes.

Self-Determination Theory

Construct validity

Firstly, we found that perceived autonomy support by the primary health care professional and the different types of motivation as postulated by SDT, could be assessed in reliable and valid ways in Dutch outpatients with SMI using the Health Care Climate Questionnaire (HCCQ) and the Treatment Entry Questionnaire (TEQ) (Chapter 4). Specifically, the factor structure tested for the TEQ was best represented by a model with three interrelated factors, namely identified, introjected and external motivation. These findings provided the basis for further investigations of SDT in the context of psychiatric outpatient treatment.

Additionally, the short and simple version of the TEQ called the Short Motivation Feedback List (SMFL) was developed, but this measure did not show acceptable reliability and construct validity (Chapter 4). The items of the SFML may be understood by consideration of both Self Determination Theory and approach-avoidance theories of motivation[208]. Although primarily based on SDT, several items can be interpreted as representing approach motives ('I will feel proud of myself if I do so') or avoidance motives ('I may not disappoint myself' and 'I may not disappoint others'). Considering the brevity of the questionnaire (i.e. 8 items), very high reliabilities were not desirable as this could indicate that items were redundant. It was concluded that the SMFL was useful as a communication tool, such that it could be the starting point for a discussion between the patient and clinician regarding the patient's current motivation for treatment, where these external/internal and approach/avoidance motives could be explored further.

Plausibility, robustness and explanatory power of the theory

The relations between perceived autonomy support, perceived competence, types of motivation for engaging in treatment and clinical outcomes, which represented the basic process model of SDT, were investigated using structural equation modelling (Chapter 5). In the full sample of 294 patients, the results supported all the hypothesized relationships in the model, yet it was also found that direct additional associations were required between perceived competence and clinical outcomes which were not a-priori hypothesized (see Figure 1). The necessity of such direct effects from competence to all outcomes suggested that the patient's perception of being able to do what the treatment required was one of the most important factors in relation to the patient's treatment engagement, psychosocial outcomes and quality of life. Alternative models in which, for example, autonomy support was directly related to clinical outcomes were not supported by the data. Further, we found that this model was robust, in the sense that it was stable across time (i.e. baseline assessment and follow-up assessment after 12 months) and across different diagnostic groups of SMI patients (i.e. psychotic disorders and personality disorders). The most plausible clinical-empirical model suggested that that gaining a sense of competence was facilitated by autonomy. In other words, once patients experience a high degree of choice, respect and relevance of treatment, they are then most likely to also experience competence to learn and do what the treatment requires.

These findings are consistent with previous studies on SDT in other health-related contexts, which have also found support for the indirect

link between perceived autonomy support and health outcomes via perceived competence [217]. Finally, it was found that the SDT process model explained around 18% to 24% of the variance of treatment engagement, around 26% of the variance of psychosocial functioning and around 31% to 36% of the variance of quality of life. These findings compare favourably to most other studies investigating models that include attitude-behaviour relationships [224], and therefore provide support for the explanatory power of SDT in the outpatient treatment of patients with SMI.

Conclusions and implications regarding SDT in outpatients with SMI

In sum, the findings support the application of SDT in the mental health care for patients who are in outpatient treatment for a severe mental illness, as SDT was found to be sufficiently valid, plausible and robust to provide a useful basis for (future) interventions in this context. SDT has shown explanatory power, yet most variance in clinical outcomes remained unexplained which suggests that there is (clearly) room for additional constructs to be considered as potential targets for interventions to improve clinical outcomes. Other SDT constructs that were not part of the current study, such as perceived relatedness, other types of motivation and/or causality orientations[48], may need to be incorporated into future modelling efforts and subsequent interventions such that explanatory power and effectiveness of interventions may be improved.

Before clinical practice will be able to optimally profit from SDT-based interventions, further research is needed. Further longitudinal monitoring of SDT constructs in outpatient treatment is needed to allow for more elaborate (i.e. "complete") models to be constructed to examine the crucial mechanisms of change. In doing so, the most essential and powerful (explanatory) constructs can be identified, which may then be specifically targeted in health care interventions. Future studies could benefit from a so-called conjoint analytic approach which can, for example, include the combined effects of high and low autonomy and competence or motivational profiles of patients who show high ratings on all types of motivation compared to patients who show low ratings on several or all types of motivation, such that we could further clarify the potential additive, synergistic or antagonistic effects between these constructs. Eventually, experimental research is needed to confirm the causality of the relations between the SDT constructs and their ability to influence treatment outcomes.

The Integral Model of Treatment Motivation

Construct validity

The IM is theoretically affiliated with Ajzen and Fishbein's theory of planned behaviour[45], with a strong focus on attitudes toward the behaviour, subjective norms, and perceived behavioural control. The theory of planned behaviour however, does not account for other factors that can influence motivation, such as distress, past experience or environmental factors, which are relevant in the context of motivation for engaging in treatment (-related behaviours)[37]. The IM does take into account these factors more explicitly and may therefore be useful in the context of mental health care for patients with SMI. The concept of motivation for engaging with treatment by the IM was found to show statistically significant positive association with autonomy support, identified motivation, readiness to change, the quality of the therapeutic relationship and treatment engagement, whereas it was negatively associated with external motivation (Chapter 4). This provided preliminary support for the construct validity of the motivation concept from IM. The Treatment Motivation Scales for Forensic patients (TMS-f) as developed by the originators of IM[116,118], was investigated such that all IM constructs could be studied in relation to clinical outcomes in outpatients with SMI (Chapter 6). The original TMS-f comprises of one subscale for motivation for engaging with treatment, six subscales for the so-called internal determinants (i.e. problem recognition, distress, perceived costs of the treatment, perceived suitability of the treatment, outcome expectancy, perceived legal pressure) and a scale for social desirability. As the research in the current thesis aimed to explore whether the IM was also applicable outside a forensic psychiatric setting, we decided to adapt the construct of perceived legal pressure into a more broad perceived external pressure by others. This adjustment was justified by considering that only a subgroup of outpatients with SMI would be referred to or pressured into psychiatric treatment via the legal system, while (most) others would likely experience other pressures that drive their motivation for engaging with treatment (i.e. family, friends, partner, assertive outreaching clinicians). In our patient sample, the congeneric estimates of reliability for the internal determinants and motivation as assessed with the TMS-f ranged from moderate to excellent. This provided the basis for further investigations of the IM.

Plausibility, robustness and explanatory power of the theory

Using structural equation modelling, it was investigated whether the relations between the internal determinants, motivation, treatment engagement, psychosocial functioning and quality of life were in line with original hypotheses from IM (Chapter 6). It was found that the final empirically obtained model in the current sample was not in line with original hypothesized theory nor similar to the obtained empirical model which was previously found by Drieschner and Boomsma[116]. The hypothesized mediational effect of motivation between internal determinants and treatment engagement was only partially supported. It was found that motivation fully mediated the effects of problem recognition, suitability of treatment, costs of treatment and outcome expectancy on treatment engagement (see Figure 2). Further, the model was not acceptable in our patient sample unless additional direct associations between distress and all clinical outcomes were incorporated. Also, perceived external pressure was found to be of direct influence on the patient's treatment engagement, independent of a mediational effect by motivation. Taken together, these findings thus did not support the plausibility of the total IM in outpatients with SMI, but some support was found for the utility of IM constructs in relation to clinical outcomes. Specifically, the patient's perceived suitability of treatment, perceived costs of treatment and outcome expectancy were most strongly associated with motivation and treatment engagement. Further, the empirically derived most plausible model was not stable across time nor across different patient groups, indicating that the IM in its current form does not constitute a robust framework for patterns through which patients become motivated to engage in treatment.

Interestingly, the level of distress is generally regarded an important determinant of treatment motivation, such that more (symptomatic) suffering makes patients more motivated to engage in treatment[227]. Indeed, studies have found that treatment-seeking patients with personality disorders or substance-use disorders reported higher subjective distress than those who did not seek treatment[228,229]. However, in a previous study (not a part of the current thesis) we found that patients with SMI who showed more symptoms and more psychosocial problems were less motivated for engaging in treatment[230]. Consistent with this, for the IM we found that distress showed a negative association with treatment engagement and was unrelated to motivation for engaging in treatment (controlling for the other internal determinants). This implies that, higher distress may withhold outpatients with SMI from in engaging with treatment, which may be related to the finding that higher distress is also associated with lower outcome expectancy and lower perceived suitability of treatment (for reference, see Table 2 in Chapter 6).

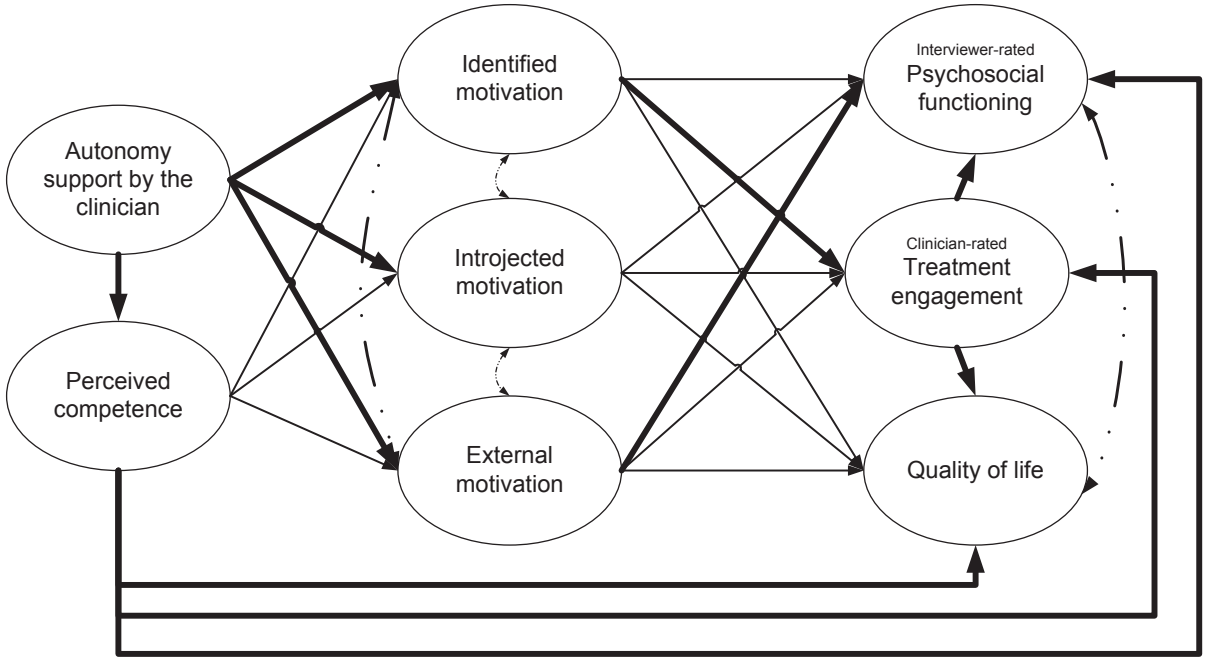
It is likely that the interrelations of internal determinants are different from what the current theory suggests. For example, it was rather remarkable that the correlation between perceived suitability of treatment and motivation was positive at both time points, yet when corrected for the influence of the other internal determinants in the final model resulted in a negative association at baseline, and again a positive association at follow-up. Such findings indicate that the interrelations of the internal determinants are likely to be more complex than the current theory suggests, and this should therefore be subject of subsequent investigations of the IM.

The obtained plausible model explained between 22% to 86% of treatment engagement, between 38% to 43% of psychosocial functioning and between 31% to 42% of quality of life, depending on the timing of the assessment. This is considerable and clinically relevant, suggesting that the concepts contained within the IM hold good potential to predict treatment outcomes. The discrepancy between explained variances at baseline and at follow-up may be explained by the relative contributions of perceived suitability of treatment and motivation, which were more pronounced at the follow-up assessment. All in all, these findings warrant further empirical investigations into the IM.

Conclusions and implications regarding the IM in outpatients with SMI

In sum, the findings in the current thesis indicate that currently, the IM does not constitute a plausible nor robust framework for patterns through which patients become motivated to engage in treatment, but the theory does include valid constructs that can explain substantial amounts of variance in clinical outcomes. Clinical implications of the findings in the current thesis include that perceived suitability of treatment, perceived costs of treatment and outcome expectancy currently seem the most interesting targets for interventions aimed at improving motivation and treatment engagement. However, similar to SDT, before clinical practice will be able to optimally profit from IM-based interventions, further research is needed.

Figure 1. Empirically supported process model for SDT in Dutch outpatients with SMI



Note: Variables reflect patient-rated constructs unless indicated otherwise. Arrows indicate the direction of the relationships, dotted lines represent intercorrelations of variables. Boldface indicates that associations were empirically supported.

Future studies should aim to test the IM in other clinical populations, to further specify the relations between constructs in the model and to re-specify (or reject) the initially hypothesized principles. Depending on the context of these future studies, researchers may choose to use the original TMS-f, or to use the version that was used in the current thesis in which the legal pressure subscale was adapted to represent external pressure. Also similar to SDT, future studies could benefit from studying the combined effects of specific scores on the internal determinants to provide motivational "profiles" of patients. The IM might be improved by re-specifying the interrelations of the internal determinants and/or by including intermediary factors such as action planning between the level of MET and the actual treatment engagement[86,115]. Including such intermediary factors might create opportunities to beneficially influence the pathway to treatment engagement, besides the targeting of the most relevant and crucial internal determinants that may improve motivation. In further (clinical-) empirical testing of the theory, it will become more accurate and thus more useful for application in clinical practice.

The Transtheoretical Model

Construct validity

TTM researchers have evaluated two distinct but related aspects of motivation: motivation for change and motivation for engaging in treatment[53]. Although related, these two concepts are not equivalent, as patients may want to change their health behaviour problem without professional help, or vice versa, patients can come into treatment and be motivated to engage in treatment activities but still be reluctant to change their health behaviour problems. At the start of the current research project, it appeared that the TTM had been understudied regarding motivation for changing psychiatric problems in outpatient treatment for patients with SMI[63], despite its potential in this domain[86]. Therefore, the convergent validity and criterion validity of the staging algorithm and the University of Rhode Island Change Assessment (URICA-D) were studied for such application. Using these two measures, as well as measures for other TTM constructs, validity was investigated using structural equation modelling in the sample of 294 SMI outpatients (see Figure 3).

It was found that the two measures showed low convergence at both time points (i.e. baseline and follow-up) and thus seemed to assess different aspects of motivation to engage with psychiatric treatment (Chapter 7). As such, no support was

found for convergent validity. Also, both measures only partially showed the theoretically expected associations with criterion measures such as other TTM constructs, including the processes of change, decisional balance and self-efficacy. Findings were also mixed regarding the associations between stages and clinical outcomes for both assessment methods, such that the majority of the theoretically expected associations were not confirmed. For example, the stages generally did not show the theoretically expected differentiation between stages and the mean level of treatment engagement. Thus, these findings revealed important problems regarding the construct validity of stages for changing psychiatric problems in outpatient treatment for patients with SMI.

Despite the limited range of scores on the URICA-D and the frequency distributions on the staging algorithm, it was expected that, in a population of patients who receive assertive outreaching psychiatric care, a distinction between patients in contemplation and those in maintenance should be possible (if these stages are indeed present and are a 'real' entity). However, the results suggested that – at least in so far as these stages are assessed with the algorithm or the URICA – the stages are difficult to distinguish from each other and therefore may not constitute clinically identifiable separate stages regarding readiness to engage with treatment. Minimally, this casts doubt on the potential utility of the stage construct from TTM as a framework for motivation for engaging with treatment considering that the processes, markers and outcomes that are supposed to be capable of distinguishing the stages do not do so. Acknowledging that the cross-sectional approach to studying the stage construct is limited in its ability to identify stages from pseudo-stages or a (nonlinear) continuum model[77], the findings of the current study do not seem to support a stage theory. It has previously been argued that the use of the stage construct in clinical practice for patients with SMI is problematic even aside from the lack of validated measures, as patients typically present with multiple problems whereas the stage construct seems to require "that central, one and only, specifically identified problem" (p. 54) [113]. The findings in the current thesis seem to affirm these problems.

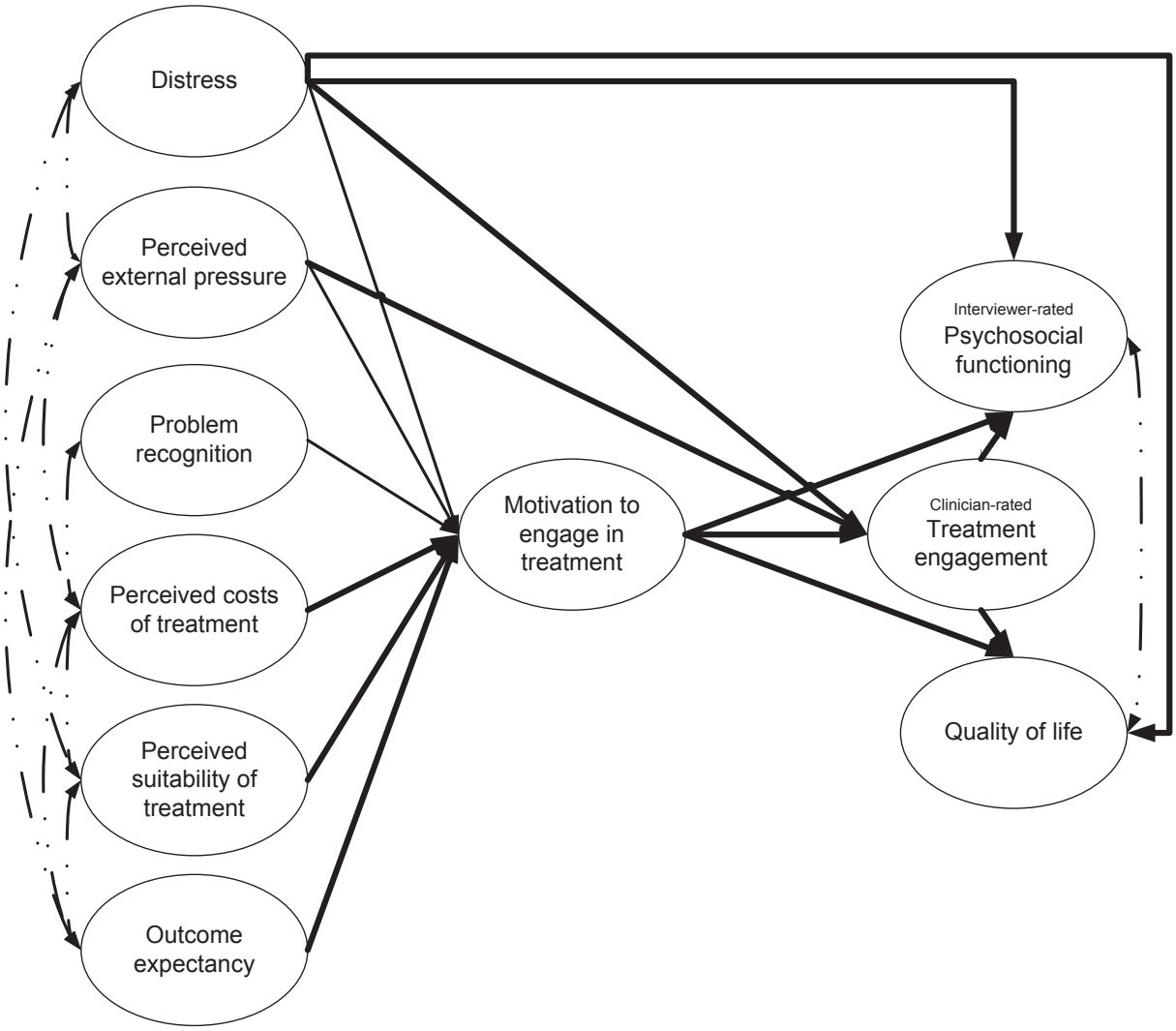
It should be noted that, there were reliability issues for the URICA-D which, by definition, undermine validity. Only the action scale of the URICA-D showed an acceptable level of internal consistency, whereas the other scales showed poor to questionable internal consistencies. Inter-item correlations were generally in the low range overall, implying that the items within each subscale did not reflect the same underlying construct. It is plausible that the generic problem statement 'willingness to change psychiatric problems during outpatient treatment' was too broad, such that patients with different types of psychiatric problems and different treatments (e.g. with or without medication, additional supportive employment, volunteer work opportunities etc.) may have had different response tendencies, resulting in problems with internal consistency. Studies using the URICA in other populations have shown higher internal consistencies, such as in patients in methadone maintenance treatment[232] and dually diagnosed patients[57], which may imply that the use of the URICA is more suited for treatment settings which specifically focus on addiction problems in psychiatric outpatients rather than the psychiatric problems itself. However, the URICA was found to have questionable external validity in those patient groups as well[101,232]. Alternatively, when a total "readiness for change score" was calculated by subtracting the precontemplation scale score from the sum of the other three scale scores (consistent with other studies using the URICA-D[57]), this resulted in good internal consistency, namely a congeneric estimate of 0.90. This readiness to change score was found to show statistically significant positive association with identified and introjected motivation, motivation for engaging with treatment, perceived autonomy support and the quality of the therapeutic relationship (Chapter 4). The readiness to change score also showed statistically significant negative association with external motivation, yet it was not significantly related to treatment engagement. Taken together, the findings are contradictive of the hypothesized stage construct of the TTM, but rather seem supportive of an underlying continuum of readiness to change.

To summarize, when using existing popularly applied measures to assess the TTM constructs, it seems that we still lack empirical support for the validity of the stage construct of the TTM model as a way of evaluating the patient's motivation for engaging with the treatment services. The findings in the current thesis thus underscore the need for the further (development and) evaluation of such measures.

Plausibility, robustness and explanatory power of the theory

The problems with the validity of the stage construct as described above, cast serious doubt on the plausibility of the stage construct for engaging with psychiatric treatment services. Although it was

Figure 2. Empirically supported process model for IM in Dutch outpatients with SMI



Note: Variables reflect patient-rated constructs unless indicated otherwise. Arrows indicate the direction of the relationships, dotted lines represent intercorrelations of variables. Boldface indicates that associations were empirically supported.

found that the associations between stages and treatment engagement were consistent across time and different patient diagnostic groups (Chapter 7), showing support for robustness, the stages showed limited ability to explain treatment engagement behaviour and clinical outcomes. Only 6% to 16% of treatment engagement was explained by the stage construct, and between 8% to 17% of psychosocial functioning and between 5% to 15% of quality of life, depending on the timing of the assessment. The relevance of these findings is ambiguous, considering the previously mentioned problems with the validity of the stage construct. The stage construct is only one part of the TTM, as TTM also includes other constructs and hypotheses, yet the stage construct is considered the central and distinctive construct in the theory. It seems that, 15 years after Stephen Sutton urged researchers to go "back to the drawing board" with the TTM[88], little advancement has been made regarding changes in the definition and operationalization of the stage construct, resulting in applications of unreliable and invalid measures in clinical practice. This currently prevents advancements in the further development and research on the TTM.

Conclusions and implications regarding the TTM in outpatients with SMI

In sum, the findings in the current thesis indicate that currently, the TTM does not constitute a plausible framework for patterns through which patients are motivated to change their psychiatric problems in outpatient treatment. There are serious problems with existing popular methods used to assess the central stage construct, casting doubt on the reality of 'stages' and questioning whether the

TTM provides a valid description and explanation of the process of change during psychiatric treatment. These problems have previously been identified in other populations, mainly in the context of smoking cessation and addiction treatment[80,88,90], while the findings in the current thesis indicate that these problems also exist in the context of outpatient psychiatric treatment for patients with SMI.

These findings are problematic, as the potentially unique and useful contribution that the TTM can bring to the psychiatric treatment of patients with SMI, can only be adequately studied if we can reliably and validly assess its main constructs. The main focus of future studies should therefore be to (develop and) test other staging instruments, such that these can be a foundation for further research into the utility of the TTM in psychiatric treatment services. Until such reliable and valid assessments for the patient's stage of change for engaging with psychiatric services are available, essential questions regarding the potential utility of the TTM in this context cannot be adequately addressed.

It seems that there is a rather large discrepancy between the evidence base for the application of the TTM in clinical practice, and the still enormously popular use of the TTM in actual clinical practice[43,61,257]. The popularity of the TTM in clinical practice has mainly been ascribed to its considerable heuristic value, as the model portrays change as "more than a simple, one-step process and may promote a less pejorative view of people who are not ready for change and those who relapse" (p. 224)[79]. It seems that the TTM is primarily used to encourage greater patience and persistence in change efforts (both in patients and clinicians) and to evaluate the timing of certain interventions. The questions that TTM raises remain important for clinical practice, including whether there are critical periods during which specific intervention strategies should be applied to facilitate treatment engagement and improve clinical outcomes for patients with SMI. However, the research presented in the current thesis, combined with previous critical reviews on the TTM in other health behaviour contexts[79,80,88,99], suggest that the TTM cannot have much practical utility if its basic constructs are not accurately defined and operationalized, or if the basic constructs (i.e. the stages) do not reflect actual real-life qualitatively different states. Several randomised clinical trials to date which have investigated stage-matched versus mismatched interventions have found little support for the superiority of matched over mismatched interventions [235-237,287], suggesting that the studies showing beneficial effects for TTM-based interventions compared to other types of interventions may be a consequence of other mechanisms and characteristics of the TTM-interventions, but not a consequence of stage-matching.

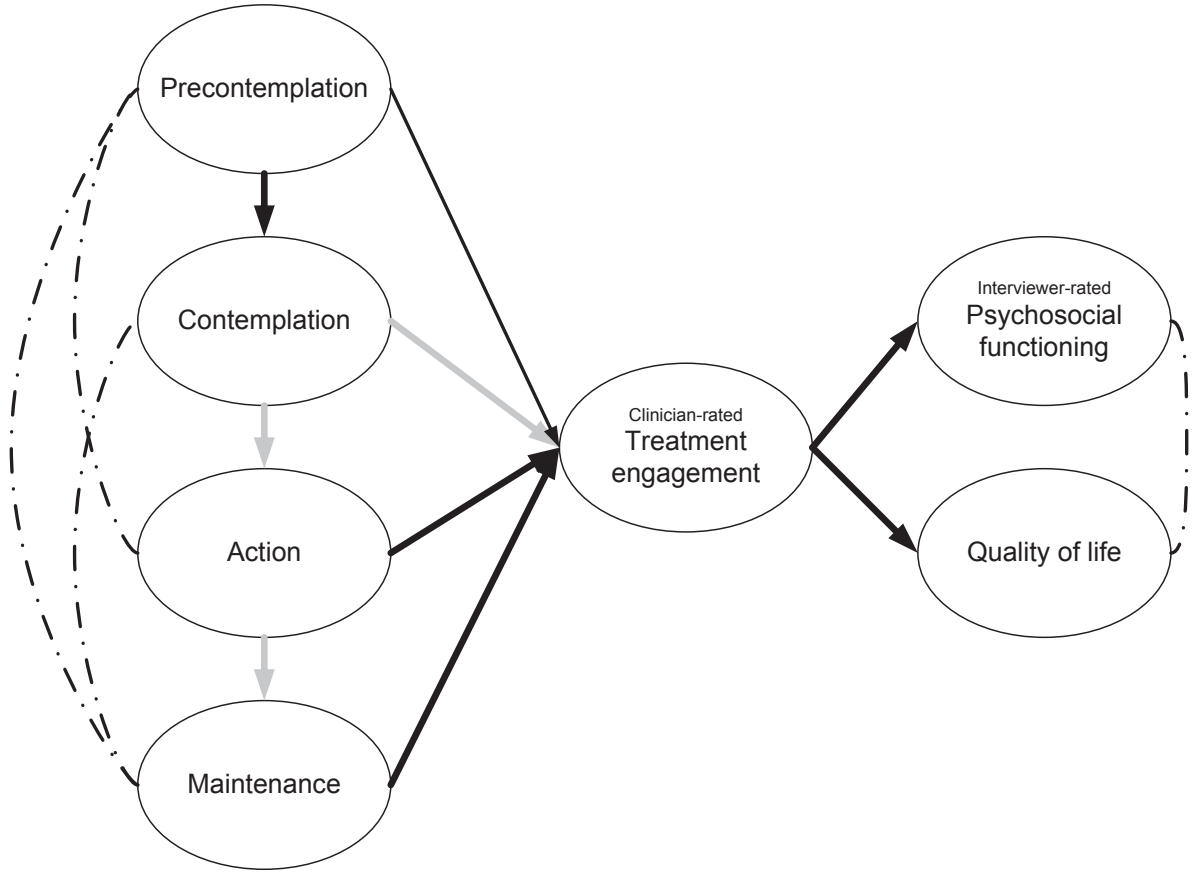
Although the TTM raises important questions and appears to have provided useful ways of thinking in clinical practice about how people engage in health behaviour changes, we agree with Littell[79] and Sutton[88] that it is time to consider alternative conceptualizations of motivation and behaviour change. Specifically, the heuristic value of TTM may be maintained, including the importance of the *timing* of interventions, while the notion of 'stages' may be replaced by a more parsimonious continuous model of motivation and behaviour change[79]. Such a model may still include TTM constructs such as self-efficacy, decisional balance and processes of change, and may be more easily integrated with potent and useful constructs from SDT, the IM and other theories. In the following, an attempt is made for such an integration.

An integrated approach to motivation in outpatient treatment

Based on the findings of the three motivation theories, we suggest that the model as depicted in Figure 4 may be used as the basis for an integrated approach to motivation in the context of outpatient psychiatric care for patients with severe mental illness. Figure 4 visualises our empirical findings, as well as (further) testable hypotheses regarding the relationships within and between the theories. Central to this integrated model is the use of SDT as the connecting theory between the other two theories (shown in grey), which was chosen for several reasons.

Firstly, motivation as defined by SDT applies to motivation for engaging with treatment (as in IM) as well as motivation for engaging in behaviour changes that may occur inside or outside of treatment (as in TTM). Secondly, the use of SDT in outpatient treatment for patients with SMI was empirically supported by the research in this thesis, as this model compared favourably to the other two theories in terms of reliability, validity, plausibility and robustness. Regarding explanatory power in terms of how much variance was explained by each theory in the clinical outcomes, the three theories are not easily compared as they include different (and unequal numbers of) constructs. Obviously, theories that include more predictors have a higher likelihood of explaining more variance (assuming that these predictors are meaningful). In line with this, it was found that the IM was most powerful

Figure 3. Empirically supported process model for TTM stages of change in Dutch outpatients with SMI



Note: Variables reflect patient-rated constructs unless indicated otherwise. Arrows indicate the direction of the relationships, dotted lines represent intercorrelations of variables. Boldface black lines represent associations that were empirically supported by two different assessment methods for stages of change. The boldface grey line indicates that the two assessment methods showed associations in opposite directions.

while the TTM stages of change were least powerful. As noted previously, all three theories deserve further empirical research to ensure further theory development, albeit that each theory has different "empirical needs" in terms of reliability, validity, plausibility, robustness and explanatory power.

The third reason that SDT was chosen as the connecting theory, is that preliminary empirical support was found for the associations between the qualitatively different types of motivation from SDT and the quantification of motivation by the IM and TTM (Chapter 4). That is, higher levels of identified motivation were associated with higher levels of motivation for treatment and readiness to change, while higher levels of external motivation were associated with lower levels of motivation for treatment and readiness to change. These findings were consistent with other studies in different contexts[97,127,140,141], and deserve further empirical testing in outpatients with SMI. Nevertheless, several important questions for both research and practice are raised by this integrated theoretical model. These include whether high distress and high perceived external pressure are consistently associated with low motivation, low treatment engagement and low readiness to change, whether more internalized motives are associated with more long-term behaviour change and whether higher need satisfaction is consistently associated with better quality and more enduring motivation for engaging with treatment services as well as behaviour changes.

Figure 4 also assumes that certain internal determinants are differentially associated with the quality of a patient's motivation (as depicted), as for example high distress and perceived external pressure are hypothesized to be associated with low patient need satisfaction and thus with more extrinsic motivation or even amotivation, while also being associated with low readiness to

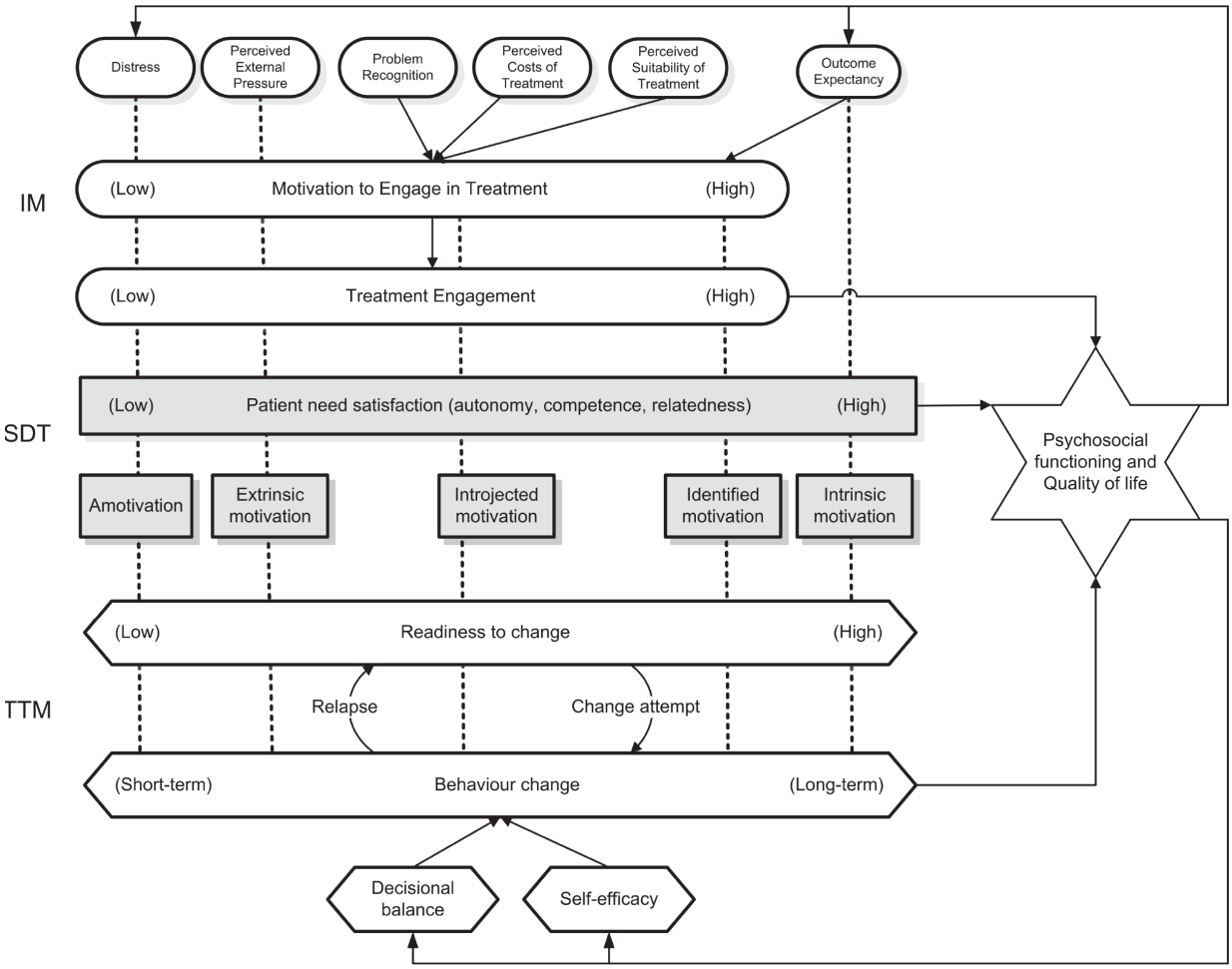
change and if change occurs, it would be short-term only. Conversely, high outcome expectancy is hypothesized to be associated with higher motivation for treatment but also with higher patient need satisfaction and more long-term behaviour changes (if they occur). Further, it can be seen that three internal determinants, namely problem recognition, perceived costs of treatment and perceived suitability of treatment are hypothesized as specific predictors for motivation for treatment, whereas distress, perceived external pressure and outcome expectancy may be related to motivation for engaging with activities outside of treatment. Figure 4 also assumes that, intrinsic motivation does not apply to motivation for engaging in treatment whereas it may apply to behaviour changes.

Regarding the TTM, we argue for a more parsimonious continuous approach to readiness for change and we show in Figure 4 that we have abandoned the idea of distinct stages in this respect. Rather, we agree with the originators of TTM that there may be a certain threshold to readiness for change, after which a change attempt is made, which may or may not be persistent over time. Similar to the original TTM, it is still acknowledged that relapse is common and that change is a cyclical process, rather than linear. We believe that our alteration to the TTM still fosters the heuristic value of the model and acknowledges the relevance of the timing of certain interventions, while also acknowledging the empirical research base that has shown serious and systematic problems with the validity of the stage construct. Other TTM constructs have not been investigated in the models of the current thesis, yet previous research shows that the constructs of decisional balance and self-efficacy are associated with readiness to change and change attempts in outpatients with SMI [60,275,288-290], and may thus be relevant for future studies to include in more extensive empirical-statistical modelling. The TTM processes of change, which in the proposed revised theoretical model are no longer associated with specific stages but rather with either the level of readiness to change or with the duration of actual behaviour change, may also be subject to future investigations.

Finally, regarding the clinical outcomes of patients with SMI, Figure 4 suggests that the level of psychosocial functioning and the patient's quality of life are products of both treatment engagement, the fulfilment of basic psychological needs and behaviour changes. In other words, it is acknowledged that psychiatric treatment is only one of many pathways through which a patient may achieve a healthy, meaningful and satisfactory life. Importantly, we also assume a feedback process over time, in which a patient's psychosocial functioning and quality of life can influence the experienced distress, outcome expectancy (of treatment) and self-efficacy (in or outside of treatment) and decisional balance for change. This feedback process implies that factors may influence each other in a beneficial way over time, for example when engaging in behaviour change leads to a higher quality of life and better psychosocial functioning and hence, less distress and higher perceived self-efficacy. Vice versa, factors may also influence each other in a detrimental way, such that substantial problems in psychosocial functioning may lead to more distress such that patients do not engage in treatment nor in long-term behaviour changes, leaving them in a potentially downward spiral. All these assumptions may be empirically tested in future research to further clarify the interrelations of the theories and to identify the most useful targets for mental health care interventions.

Future studies should consider a conjoint analytical approach to motivational models, to investigate the combined effects of different types of motivation, such that we can further clarify the potential additive, synergistic, or antagonistic effects between these constructs. Although this does not directly follow from Figure 4, as the figure depicts the different types of motivation as a continuum from least to most self-determined, it is theoretically possible for patients to endorse all types of motives simultaneously. Supported employment may be an example of such conjoint endorsement, as this combines the intrinsically motivating psychological benefits of work (e.g. sense of competence and having a valued social role, sense of autonomy) with the externally rewarding benefits of earning money[196]. If such dynamics are found to also apply to engaging with treatment services, this could argue for an approach that simultaneously fosters both extrinsic and identified motivation for engaging in treatment. For example, extrinsic rewards such as praise by a mental health worker or receiving help for financial problems, may help to achieve short-term desired goals and provide a sense of self-competency and relatedness, while the support for autonomy could ensure that patients do not become dependent on such external rewards and still feel self-determined in their choices and behaviour [196,214]. Also, for patients where distress is high while other motivational determinants are low, this may provide an argument for the paternalistic practices as performed by the assertive outreach teams, trying to engage patients who are in need of

Figure 4. Revised visualisation of the three motivation theories and their interrelations in outpatients with severe mental illness



Note: IM = Integral Model, SDT = Self Determination Theory, TTM = Transtheoretical Model. Dotted lines represent proposed and preliminary empirically supported relationships between the three theories. Arrows represent the direction of proposed and empirically supported relationships within a theory.

help but do not seek or accept it[36]. These patients might be engaged by first increasing the external (legal) pressure, which could provide a starting point for short-term behaviour changes and initial treatment engagement after which – preferably as soon as possible or even parallel to it, if the proposed model is plausible and has explanatory power – more autonomy supportive interventions are applied in order to foster the basic needs and facilitate the internalization process.

Limitations to the proposed revised theoretical model

It should be noted that the three motivation theories considered in the current thesis are psychosocial models of motivation tailored to individuals, as opposed to for example, community and societal models that focus more on how individuals interact with their environments, social networks and organisations, or biopsychosocial models that also explicitly include biological factors such as genetics and developmental, immunological and neurological factors that may influence or interact with motivation. Researchers, program developers and clinicians should not ignore the wide array of unconscious, biological and higher-level influences that affect motivation and behaviour. As such, neither of the three theories alone nor our proposed revised theoretical model (Figure 4) should be viewed as holistic or complete. Further, other theories of motivation and health behaviour, such as protection motivation theory[291], approach-avoidance models[208], distinctions between implicit and explicit motives[292,293], implementation intentions[294], expectancy-value theory[270], social cognitive theory[46] and/or the health belief model[47], may prove to have incremental value or provide substitutes for the theoretical constructs and interrelationships depicted

in Figure 4. We encourage researchers to design and conduct studies to test two or more theories simultaneously and compare them, to further advance theory and practice for outpatients with SMI.

Reflecting on the results of the randomised controlled trial

The overarching design for all the research presented in the current thesis was the cluster-randomised controlled trial. Our trial should be viewed as exploratory and pragmatic of character, as opposed to confirmatory and explanatory[295]. That is: *"A pragmatic randomised trial is undertaken in the "real world" and with usual care and is intended to help support a decision on whether to deliver an intervention. An explanatory randomised trial is undertaken in an idealised setting, to give the initiative under evaluation its best chance to demonstrate a beneficial effect"* (p. 1)[295]. The rationale for the Motivation Feedback (MF) intervention tested in our trial, was based on numerous studies that suggested that evaluation of the patient's motivation could help to understand how a patient may best be engaged in treatment [29,35-37,228] and on meta-analyses that had shown beneficial effects of employing feedback to clinicians on their patients' mental health outcomes [39,49,242]. This supported the assumption that MF could be a valuable addition to treatment as usual for outpatients with SMI. The main hypothesis of the trial was that MF would induce more awareness regarding motivational issues that were at play during treatment, and subsequently to more suitable (motivational) interventions that would help to improve the patient's motivation, leading to better outcomes (i.e. treatment engagement and psychosocial functioning). MF was provided additional to treatment as usual (TAU), which consisted of assertive outreaching care by multidisciplinary community mental health teams.

After one year of treatment, there were no differences between MF and TAU regarding clinician-rated treatment engagement and the number of no-shows, and no differences regarding the patient's psychosocial functioning and quality of life (Chapter 8). The results of the trial further showed that SMI patients felt that talking about their motivation with their clinician did not change their motivation, while interestingly, clinicians reported lower introjected motivation and, when four or more MF sessions were performed, also lower external motivation. This suggested that clinicians noticed a reduction in relatively external motivation for engaging in treatment in their patients in response to MF, signifying that their perception of the patient's motivation had changed in response to the intervention. Combined with findings that especially introjected motivation for treatment was difficult for clinicians to estimate at baseline (Chapter 9), this suggested that MF led to a change in the clinician's perception of the motivation such that it became more closely aligned with the patient's perspective. As such, the intervention may have enhanced the clinician's ability to estimate the patient's perspective on motivation, supporting the first premise of our main hypothesis of the trial. This suggests that SDT-based MF can be a useful communication tool for the clinician to explore the patient's perspective, resulting in more accurate assessments by the clinician regarding the patient's motives for engaging with services.

However, considering the lack of effectiveness of MF on the other outcomes, we concluded that the addition of MF did not result in more effective health care interventions as compared to TAU only. An evaluation of our trial's internal validity, or in other words, an evaluation of biases, may explain why MF was not found to be more effective than TAU only. Three main sources of bias[296] will be reviewed here: selection bias, information bias, and confounding. Regarding selection bias, we feel that a bias is likely to have occurred during the implementation of the study, rather than in the design stage. In our design, we introduced an incentive to all patients who participated in the trial, such that the likelihood would improve that patients with low levels of motivation, treatment engagement and psychosocial functioning would participate in the trial. Nevertheless, we found evidence for a non-response bias in our study sample such that SMI patients with substantial problems in their motivation for engaging in treatment, treatment engagement and psychosocial functioning were less likely to participate. The current patient sample already showed relatively high levels of identified motivation, treatment engagement, and psychosocial functioning and low levels of no-shows to begin with (considering the range of scores). Further, the reasons that non-participants gave for declining participation in the trial, including feeling too ill or incapable, and the finding that non-participants were more likely to be patients with a psychotic disorder, suggest that the most severely ill patients did not participate. Such ceiling effects and selection bias may explain why MF was not able to improve outcomes, and suggest that the findings of the current study may not be generalizable to the general SMI outpatient population but are limited to patients who are already relatively well engaged in treatment and function at a relatively high level.

Further, a limitation in the trial was that clinicians and patients were not blind for treatment allocation which may have influenced the information that they gave on the outcome questionnaires (i.e. information bias). Observer bias in clinicians, and potentially (under)reporting bias in patients, may have obscured the results. Although it is common in mental health research[246] that blinding is not feasible, the lack of blinding might have biased the results towards the null or even counterproductive effects of the MF intervention if clinicians generally did not expect the intervention to work. Finally, assuming that the randomisation procedure was successful, we believe that confounding was unlikely to explain the negative results of the intervention trial.

A further evaluation of the design of our pragmatic trial, using the PRECIS-tool[295] for applicability, learns that we made adequate efforts to optimize eligibility, recruitment, setting, organisational factors and statistical analyses while we may have failed to adequately address issues of 1) adherence to the intervention, 2) the follow-up of patients, and 3) to choose a primary outcome that was relevant to participants.

Regarding the first issue, there were large variations between teams and clinicians in the number and duration of SMFL assessments, reflecting that there were implementation difficulties. Although such variation is common in pragmatic trials, the findings may reflect that too few MF sessions were actually utilised (i.e. 45% on average) or that the way MF was used in the sessions was not able to beneficially affect motivation and treatment engagement. Not seldom, clinicians admitted that they regularly forgot to do SMFL assessments despite efforts from the research team to help them remember, and some reported that they were burdening the patient with 'yet another list to fill out'. Such comments seem reflective of a health care context where external demands and contingencies pressure people to behave in particular ways [225]. If this was the case, this is likely to have been a counterproductive mechanism in the MF intervention[64]. Although we performed evaluation sessions with clinicians in MF alongside the trial, we have limited insight into what happened during MF sessions as these were neither recorded nor supervised. The exact communication processes within the sessions and whether or not they were autonomy supportive remain unclear, whereas such processes might explain why the MF intervention was not successful. Despite the training and evaluation sessions for clinicians in MF, we may have failed in providing the professionals with the necessary competencies and tools to be able to address different types of motivation for engaging in treatment in patients with SMI and how to provide support for the needs of autonomy, competence, and relatedness. More attention for the implementation process, including a minimum intensity of the feedback intervention, may be needed to reach favourable effects. Encouragement of both clinicians and patients into active involvement with MF is already difficult when facing patients with highly prevalent cognitive impairments, communication difficulties, and comorbidities, let alone in a health-care context faced with reorganizations, and as such this requires a unique set of competencies from both researchers and clinicians to ensure sufficient implementation.

Regarding the second issue, the timing of our outcome evaluation might have been suboptimal. Meta-analyses have shown that outcome feedback had beneficial effects if outcomes were measured within 9 weeks after initial assessment[39,147]. As our study measured outcomes after 12 months, potential short-term beneficial changes of the MF intervention will have gone unnoticed and may have worn off by the end of follow-up. An additional assessment moment within the first three months of our study could have been informative in this respect, but due to practical and financial limitations this was not feasible. Future trials may choose to shorten the period to follow-up assessment or to include more frequent intermediate assessments of important process variables and outcomes.

Regarding the third issue, our choice for treatment engagement as the primary outcome may not have been of obvious importance from the patient's perspective and can be considered as somewhat distant from the key focus of the intervention[295], namely a discussion about the patient's motivation and the support of basic needs by the clinician. Other (primary) outcomes that we could have considered are, for example, perceived autonomy support, the quality of the therapeutic relationship and/or the patient's outcome expectancy of the treatment. Future pragmatic trials should therefore consider whether their primary outcome is relevant (enough) to participants.

Conclusions and implications regarding the use of Motivation Feedback based on SDT

In hindsight, we may have had a too optimistic view of the potential effectiveness of MF additional to TAU. In the Netherlands, the accessibility and quality of mental health care for patients with SMI are currently at a relatively high level [10]. TAU was provided by multidisciplinary treatment teams that provided care

tailored to the patient's individual symptoms and needs for care and could include assertive outreach, medication, social and financial management, job counselling, crisis interventions and psychotherapy. Such care may have been sufficiently effective for the patients participating in our trial, such that MF did not prove to be of additional value in our patient sample. Acknowledging the limitations of our trial (as mentioned previously), we believe that several conclusions regarding the use of MF are justified.

MF may have resulted in a better assessment of the patient's motivation by clinicians, but was otherwise ineffective at improving outcomes. These findings were not attributed to problems in the underlying theory, but rather to an inability of the intervention to beneficially affect crucially important mediators of change: the patient's perceived competence and identified motivation. Remaining questions include which specific techniques clinicians need to be trained in and which other contextual factors need to be influenced in order for patients to experience an improvement in their basic needs (over and above the effects of the treatments that are currently provided), and whether the use of SDT-based interventions are differentially effective for patients at the start of treatment as compared to patients who have been in treatment for many years already (the latter being the case for most patients in the current trial). Regardless, the results of the trial currently discourage the implementation of the SDT-based MF intervention into community mental health care for SMI patients. It appears that successful outcome monitoring systems include additional support and services alongside motivation feedback which allows for beneficial changes in clinical outcomes. In the future, there may be a place for SDT-based MF as a communication tool for the clinician to explore the patient's perspective, after which other tailored interventions and services may be applied to improve patient motivation, treatment engagement and most importantly, symptomatic and functional outcomes.

We have concluded that the findings of the trial were not attributable to problems with the underlying theory, namely SDT, whereas one could still question whether the SDT process model was stable and comparable across the two treatment groups. Additional analyses were therefore performed for this General Discussion (not reported in Chapter 8), to potentially explain the findings of the trial more thoroughly. We argue that, if the SDT process model is found to be stable across the two patient groups, this would further support the idea that the SDT process model was applicable in both treatment groups in similar ways. If not, the findings could help to understand more thoroughly which mechanisms may have been responsible for the lack of effectiveness (i.e. no superiority) of MF compared to TAU. To this end, we compared the obtained most plausible SDT model across the two treatment groups using structural equation modelling, in line with the analyses from Chapters 5, 6 and 7. Both at baseline and at follow-up, it was found that the model was different across the two treatment groups (baseline model: $\Delta\chi2=38.49$, $\Delta df=21$,$p=0.01$, follow-up model: $\Delta\chi2=38.66$, $\Delta df=21$,$p=0.01$). After inspecting the regression estimates, it was found that both treatment groups generally showed the theoretically expected associations between SDT constructs, yet a noticeable difference was found in the association between autonomy support and introjected motivation, regarding both the strength and direction of the regression coefficients. For patients in MF, the association between autonomy support and introjected motivation was positive at baseline ($\beta= 0.17$, S.E. $= 0.05$, $p<0.01$) while it was negative at follow-up ($\beta= -0.27$, S.E. $= 0.13$, $p=0.04$). For patients in TAU, the association between autonomy support and introjected motivation remained positive across the two time points and was stronger compared to the associations found for the MF group (baseline $\beta= 0.55$, S.E. $= 0.10$, $p<0.01$ and follow-up $\beta= 0.39$, S.E. $= 0.14$, $p<0.01$). No such differences were found for the other types of motivation, where both groups showed positive associations between autonomy support and identified motivation at the two time points, as well as comparable negative associations between external motivation and autonomy support. Thus, although the *averages* of patient-reported introjected motivation were not statistically significantly different between the two treatment groups (Chapter 8), it appears that the *relationship between autonomy support and introjected motivation* differed between the treatments. Although speculative, these findings suggest that MF may impact on the therapeutic relationship and on introjected motivation, such that an autonomy supportive health care climate combined with the use of MF may reduce introjected motives. In other words, there may have been an interaction effect between the use of MF and the nature of the health care climate in which it was introduced.

The implications of these findings are not straightforward, certainly when also considering other findings regarding potentially differential effects of SDT principles in patients with psychotic disorders as compared to those with personality disorders (Chapter 5 and Chapter 8). It was found that the SDT model at follow-up was slightly different for the two patient groups (Chapter 5).

Although both patients groups generally showed the theoretically expected associations between SDT constructs, differences were found in the strengths of the associations between SDT constructs. For example, autonomy support was found to show a stronger and more stable positive relationship to identified motivation in patients with psychotic disorders compared to personality disorders, which may indicate that patients with psychotic disorders show more stable continuous benefit from autonomy support in terms of their motivation whereas this may be more fluctuant in patients with primarily personality disorders. Further, the findings suggested that MF had opposing effects depending on the primary diagnosis, such that patients with primarily psychotic disorders showed less favourable changes in quality of life and clinician-rated motivation in response to MF compared to patients with primarily personality disorders (Chapter 8). Although the observed changes were small, it is plausible that the intervention may have had differential effects. For example, commonly found impairments in (social) cognitive functioning in patients with psychotic disorders [175,254] may explain why an intervention that requires patients to repeatedly reflect on internal motivational states may have been experienced as over-demanding or even frustrating.

All in all, it seems that the SDT process model and SDT-based interventions may be moderated by certain characteristics of the target population, which warrants further investigation. Potential moderators of the processes described by SDT in clinical populations may, for example, be treatment duration, duration of illness, cognitive functioning, patient age, diagnosis and type of treatment and the health care climate.

Strengths and limitations to the current research

The research presented in this thesis had several strengths including the conduct of studies in everyday practice of the community mental health teams, the real-life heterogeneity of the research sample and importantly, the inclusion of three theories of motivation. Other strengths included a relatively large sample size (N=294) and follow-up rate (86%) considering the often difficult to engage patient population, multiple methods for assessing motivation and the use of independent research assistants to assess the patient's psychosocial functioning, and the use of advanced multilevel statistical analyses in which corrections for unreliability of measurements were made (i.e. latent variables were modelled) and in which rivalling models were tested. Besides these general strengths, several other strengths and limitations to the research in this thesis deserve consideration.

Design and methodology

The strengths and limitations to the randomised controlled trial have been discussed previously. A major strength of the design and conduct of the current research project was the inclusion of three theories of motivation. Structural equation modelling (SEM) was chosen as the main analytical technique to address criteria of validity, plausibility, robustness and explanatory power of each of the theories. SEM offers several primary advantages over more conventional analytical approaches. First, SEM enables the testing of the plausibility (i.e. the overall goodness of fit) of a full theoretical model, which conventional multiple regression analyses are unable to do. Given the three motivation theories, with multiple hypothesized mediating variables and multiple outcomes, conventional multiple regression analyses could not evaluate the multiple mediators and multivariate outcomes simultaneously. Second, conventional regression analyses assume that scales perfectly measure the theoretical constructs, whereas measurement error is to be expected. Using SEM, latent variables can be identified which are considered free of random measurement error, thus making the test more powerful[200]. Third, SEM enables comparisons of alternative models (for example whether certain parameters can be fixed at a certain value or can be restricted to 0.00), modelling of growth trajectories in case of repeated measurements and possibilities for estimating direct and indirect effects.

Nonetheless, several limitations to our approach on model testing should be acknowledged. For all models tested (Chapters 7, 8, and 9), there is the possibility of misspecification of the identified most plausible model. For example, misspecification of the model may have occurred if (some of) the relations in the models are in fact bidirectional. These alternatives were not tested if they were not in line with original theoretical hypotheses, but such relations are likely for ongoing, repeated behaviours[77] as is the case in our study sample, where patients were not new to treatment; most had been in treatment for many years. For example, a patient who shows better psychosocial functioning would likely experience more competence in doing what the treatment requires [217] (which may be assumed in the process model of SDT), and it is plausible that the patient's outcome expectancy may depend on (previous) motivation for engaging in treatment and previous treatment engagement behaviours (which

may be assumed in the process model of the IM). A strength of the studies presented in this thesis is that for each statistical model, efforts were made to compare different structural models in order to identify the most plausible model according to both theory and data.

Another limitation is the possibility of omitted variables, or in other words, the absence of certain theoretical constructs that are of substantial relevance. Omission of relevant constructs may threaten the identified most plausible model. In case of SDT for example, constructs such as perceived relatedness, other types of motivation such as intrinsic, integrated and amotivation and/or causality orientations which are also part of the larger holistic theoretical framework of SDT [48], were not available for modelling. Although we feel confident that the constructs that have been recognized as the core constructs of SDT were included, namely autonomy support and perceived competence [65,123,217] and different types of motivation, future studies may include additional theoretical constructs.

Further, the associations between theoretical constructs may be moderated by certain characteristics of the target population, which warrants further investigation. For example, it was found that treatment engagement in patients with psychotic disorders was most strongly associated with perceived competence (independent of the type of motivation), whereas for patients with personality disorders, treatment engagement was most strongly related to identified motivation (Chapter 7). These findings may reflect different courses of motivational changes in these groups over time and, in case these findings are replicated by future studies, could argue for a differential approach to motivational (feedback) interventions in different diagnostic patient groups. Future studies should investigate potential moderators of the processes described by the theories. The association between theoretical constructs and various outcomes may vary in strength as a function of, for example, treatment duration, duration of illness, patient age, and type of treatment. These analyses were beyond the scope of the current thesis, but the detection of such moderators may have implications for the design of future theory-based studies and interventions. Furthermore, it might be indicated to perform latent class analyses to detect homogeneous subgroups.

Finally, the tests in the current study represent cross-sectional associations which were largely based on correlations that cannot be used to infer causality. Future efforts in modelling of theories may consider longitudinal approaches and cross-lagged analyses such that changes over time in theoretical constructs can be modelled, preferably by making use of multiple repeated measurements over clinically relevant periods of time, such that relevant changes are observed and can be understood in light of the theory under study. The utility of the three theories for SMI patients should be proven in clinical practice, preferably by randomized clinical trials that aim to effectively influence core theoretical constructs.

Acknowledging the limitations mentioned above, we believe that the approach to the testing of multiple motivation theories that was taken in the current thesis holds much promise for the identification of mechanisms through which changes in clinical outcomes occur which may be useful for clinical practice. Today, it is still rather unique and scarce to test multiple theories in the same population simultaneously, especially in daily clinical practice for patients with SMI. We encourage researchers to design and conduct future studies to test two or more theories simultaneously and evaluate them, to further advance theory and practice for outpatients with SMI.

Assessment issues

Measuring motivation for engaging in treatment and treatment engagement is complex and gold standards are lacking[20,37]. A strength of the current research is that we had both patient and clinician reports of motivation, two methods for assessing treatment engagement (although the registration of no-shows was compromised by policy changes during the study, namely the introduction of a fine), and the use of structured interviews for assessing psychosocial functioning by independent research assistants. Another strength is that we investigated relevant theoretical constructs on their reliability and validity (Chapters 4, 5, 7, 8, 9), before using them in subsequent analyses.

The research in the current thesis has produced several Dutch assessment instruments based on SDT, and it was shown that the Dutch HCCQ and TEQ can be used reliably and validly for assessment purposes at the level of groups and for research purposes. An advantage of the Dutch TEQ is that it only comprises 18 items, which allows for a rather quick assessment of the quality of the patient's motivation in terms of identified, introjected and external motives. The research in the current thesis did not provide a norm-referenced or criterion-referenced interpretation of the HCCQ nor the TEQ, such that these questionnaires are not yet suited for assessment applications at the individual level. Future studies may aim to produce such normative data, such that these SDT questionnaires may prove their utility at this

level as well. Further, the research in the current thesis provided support for the use of the TMS-f in outpatients with SMI. An advantage of the TMS-f is that it was norm-referenced by the developers of the scale[160] in a forensic psychiatric population (albeit not in other populations yet), such that it may be applied at the level of individuals. A disadvantage of the TMS-f is that it comprises 85 items, which is relatively long and time-consuming for patients with SMI, especially for those with cognitive impairments. Compared to the TEQ, which comprises 18 items and provides information regarding the *quality* of a patient's motivation, this could be a reason to prefer the TEQ over the TMS-f. Depending on the specific purpose of the motivational assessment however, the internal determinants or overall level of motivation may be clinically relevant to explore, which would make the IM a more appropriate framework for assessment. As noted previously, the use of the URICA-D or staging algorithm for the assessment of stages for changing psychiatric problems during outpatient treatment was problematic. The use of these instruments for such purpose is therefore discouraged based on the findings in this thesis.

In the future, the development and evaluation of assessment instruments may focus on the shortening of questionnaires, without substantial loss of information (validity and reliability) such that they may easily be applied in clinical practice for outpatients with SMI, where sufficient attention must be paid to who is doing the assessment and to consider multiple assessors and methods to measure one construct. To this end, the use of a multitrait-multimethod (MTMM) approach using structural equation modelling can be applied, which allows for an evaluation of discrepancies between two assessors or between two methods of assessments. Examples include evaluation of differences between patients and clinicians, or between questionnaires and ratings based on video recordings.

Logistics and organisational issues

Logistical issues that have likely negatively impacted the current study, include the difficulties in recruiting patients with low levels of motivation and low levels of treatment engagement and organisational changes in mental health care during the course of the study, including changes in the no-show policy and costs of mental health care for SMI patients.

Generalizability

Our study sample largely represented a heterogeneous population of outpatients with diagnoses of psychotic and personality disorders with a variety of co-morbid psychiatric disorders, which strengthens the generalizability of the study. Nevertheless, patients included in the study sample were already engaged with services for some time, whereas patients who have just entered or who are in need for help but not yet in contact with services, are likely to present with a different motivational profile and more variety in levels of functioning and quality of life. Therefore, the results of this thesis may be limited to patients who are already engaged with services and thus may not be generalizable to the entire population of outpatients with SMI, in particular those patients who are not in contact with services.

Summary of implications and recommendations

Assessment of motivation in outpatients with SMI

Choosing a measure for the assessment of a patient's motivation may be guided by several considerations. It appears that the level of agreement between patients and clinicians is unsuited to use as a criterion for choosing a motivational assessment based on a certain theory, as neither of the three theories stood out from the other theories in this regard (Chapter 9). Other criteria such as the duration of the assessment, the type of information that can be derived from the different questionnaires, the availability of norms, and whether the assessment will be used for research or practice may thus be used instead to guide assessment choices. In sum, the Dutch TEQ and HCCQ may be used to assess the quality of a patient's motivation and perceived autonomy support for research purposes and have the advantage that assessment is short (and therefore quick), 2) the Dutch TMS-f (or the version that was used in the current thesis, if applicable) may be used to assess internal determinants and the level of motivation in research and clinical practice, yet this takes relatively long and patients may need to be assisted during the assessment, and 3) the assessment of stages for changing psychiatric problems during outpatient treatment using the Dutch URICA-D or staging algorithm is problematic, and is therefore not recommended. The URICA-D may be used for research purposes in outpatients with SMI, preferably by using the total score for readiness to change (instead of subscales scores) to ensure adequate reliability.

In choosing a method of assessment, such as observer-rated, clinician-rated, patient self-report or even other methods such as video-recordings, several points deserve attention. Clinicians should be aware that patients with SMI generally have a different view on their motivation for engaging in treatment than the clinician can estimate or judge

(Chapter 9). When the therapeutic relationship is regarded as 'good', clinicians should be especially aware of the potential for halo bias[160,281]. That is, clinicians may rate patients higher in their motivation because they feel the relationship is good, whereas these concepts are distinct and may go in different directions. For example, a patient may be motivated to engage in social contact with the clinician while at the same time may not be motivated for engaging in treatment-related behaviours. This argues for a multi-method approach to the assessment of motivation, such that all perspectives are taken into account to ensure effective planning and conducting of mental health interventions.

Interventions that may optimise motivation for engaging with treatment and motivation for behaviour change

The research in this thesis supports the application of SDT in the mental health care for patients who are in outpatient treatment for a severe mental illness, as SDT was found to be sufficiently valid, plausible and robust to provide a useful basis for (future) interventions in this context. The results of the trial currently discourage the implementation of the SDT-based MF intervention into community mental health care for outpatients with SMI. If future research has further determined the essential mechanisms and moderators of motivation and behaviour change in outpatients with SMI, then there may be a place for SDT-based MF as a communication tool for the clinician to explore the patient's perspective, after which other tailored interventions and services may be applied to improve outcomes. Potentially fruitful future interventions might include more extensive and thorough training and monitoring of clinicians in the application of SDT, techniques from motivational interviewing that align with SDT [191,225], accounting for potential problems in (social) cognitive functioning and taking into account differences between diagnostic groups of patients, as well as feedback components. Specific techniques that clinicians may use to support the needs for autonomy, competence and relatedness have been described elsewhere [65,123,212] and may be adjusted for applications in outpatient psychiatric treatment for SMI patients.

The other two theories, were found to need more extensive research into reliability and validity of constructs (TTM) and plausibility and robustness (IM and TTM) before application in future clinical trials and interventions for outpatients with SMI are considered. Specifically, the IM does not constitute a plausible nor robust framework for patterns through which patients become motivated to engage in treatment, but the theory does include valid constructs that can explain substantial variation in clinical outcomes, thus showing potential for this model to – eventually - inform clinical practice. Regarding the TTM, the research presented in the current thesis combined with previous critical reviews on the TTM in other health behaviour contexts[79,80,88,99], suggest that the TTM cannot have much practical utility if its basic theoretical constructs are not accurately defined and operationalized, or if the basic constructs (i.e. the stages) do not reflect actual real-life qualitatively different states. Future studies on TTM in outpatients with SMI should aim to test other staging instruments and perhaps, as shown in Figure 4, consider an alternative framework for the research on TTM that takes into account both the cyclical process of behaviour change as well as the problems with the stage construct, both in research and practice.

The model as depicted in Figure 4 may be used as the basis for an integrated approach to motivation in outpatient psychiatric care for patients with SMI. This model may first serve to guide future research, after which it can potentially also inform the development and use of clinical interventions.

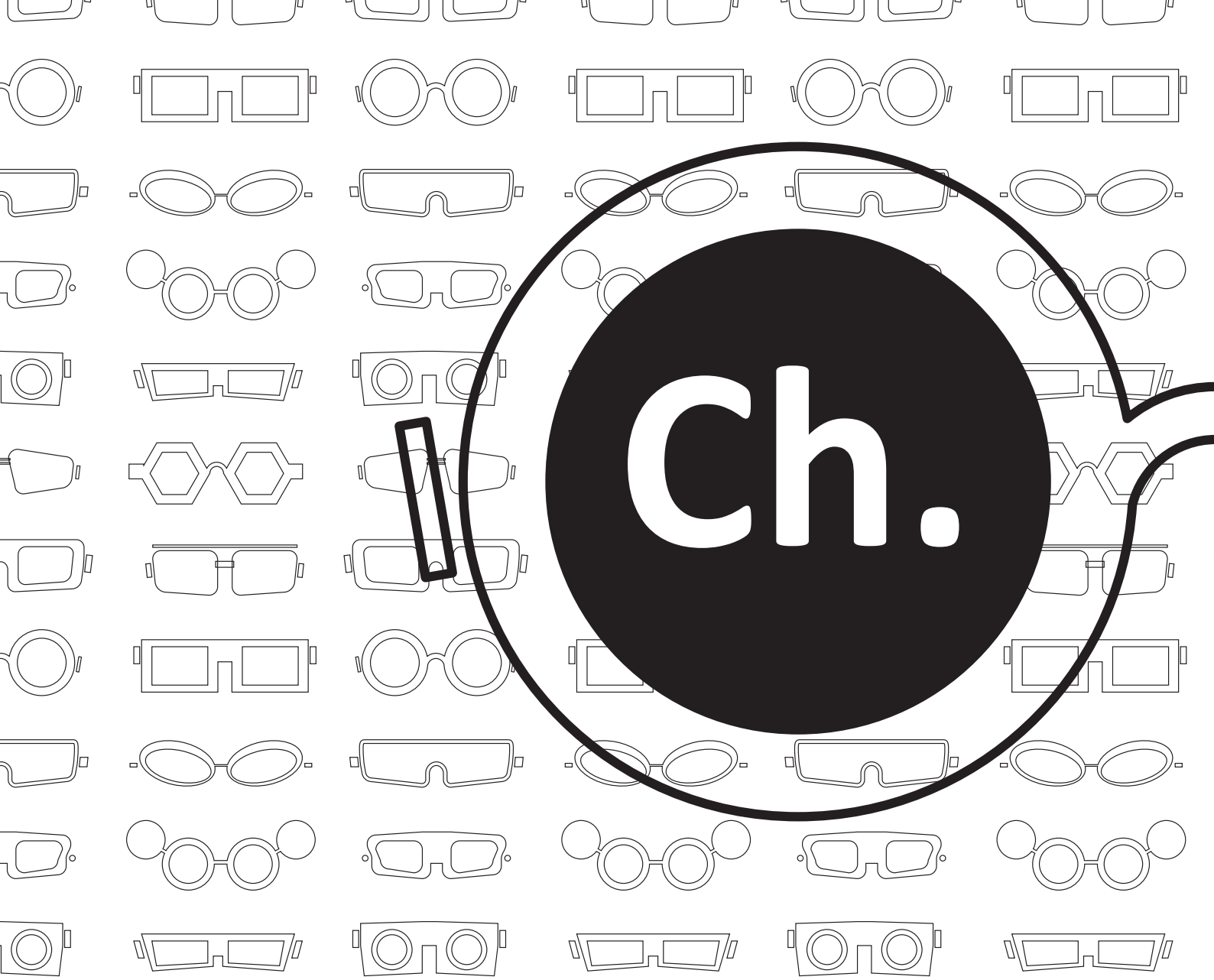
Future research on motivation in outpatients with SMI

We hope that the research presented in this thesis will inspire other researchers to design and conduct studies to test multiple (motivation) theories simultaneously and compare them, to further advance theory and practice for outpatients with SMI. As noted, Figure 4 may be used to clinically-empirically test hypotheses regarding the associations between the three motivation theories, while researchers may also decide to empirically investigate other theories of motivation and health behaviour such as models that include biological factors or those that focus on motivation from a societal or organisational perspective.

The development and evaluation of assessment instruments deserves specific attention in future research, as the reliable and valid assessment of theoretical constructs is the basis for building and testing theories. Such studies may focus on the optimal shortening of questionnaires such that they may be applied in clinical practice for outpatients with SMI, and to consider multiple information sources and methods. To this end, the use of a multitrait-multimethod (MTMM) approach using structural equation modelling could be helpful.

Research within theories, should be dedicated to further examine models in outpatients with SMI, preferably with longitudinal monitoring (and

cross-lagged analyses) of theoretical constructs in outpatient treatment to allow for more elaborate models to be constructed to get a solid understanding of change. In doing so, the essential and powerful explanatory constructs may be identified, which may then be targeted in (clinical trials on) health care interventions. An analytical approach that includes the combined effects of high and low autonomy and competence, or motivational profiles of patients who show different ratings on internal determinants, could be informative such that we could further clarify the potential additive, synergistic or antagonistic effects between the theoretical constructs. The detection of moderators and synergistic effects may have important implications for optimising the design and conduct of future theory-based studies and interventions. Eventually, experimental research is needed to confirm (or to falsify) the causality of the relations between theoretical constructs and their ability to influence treatment outcomes.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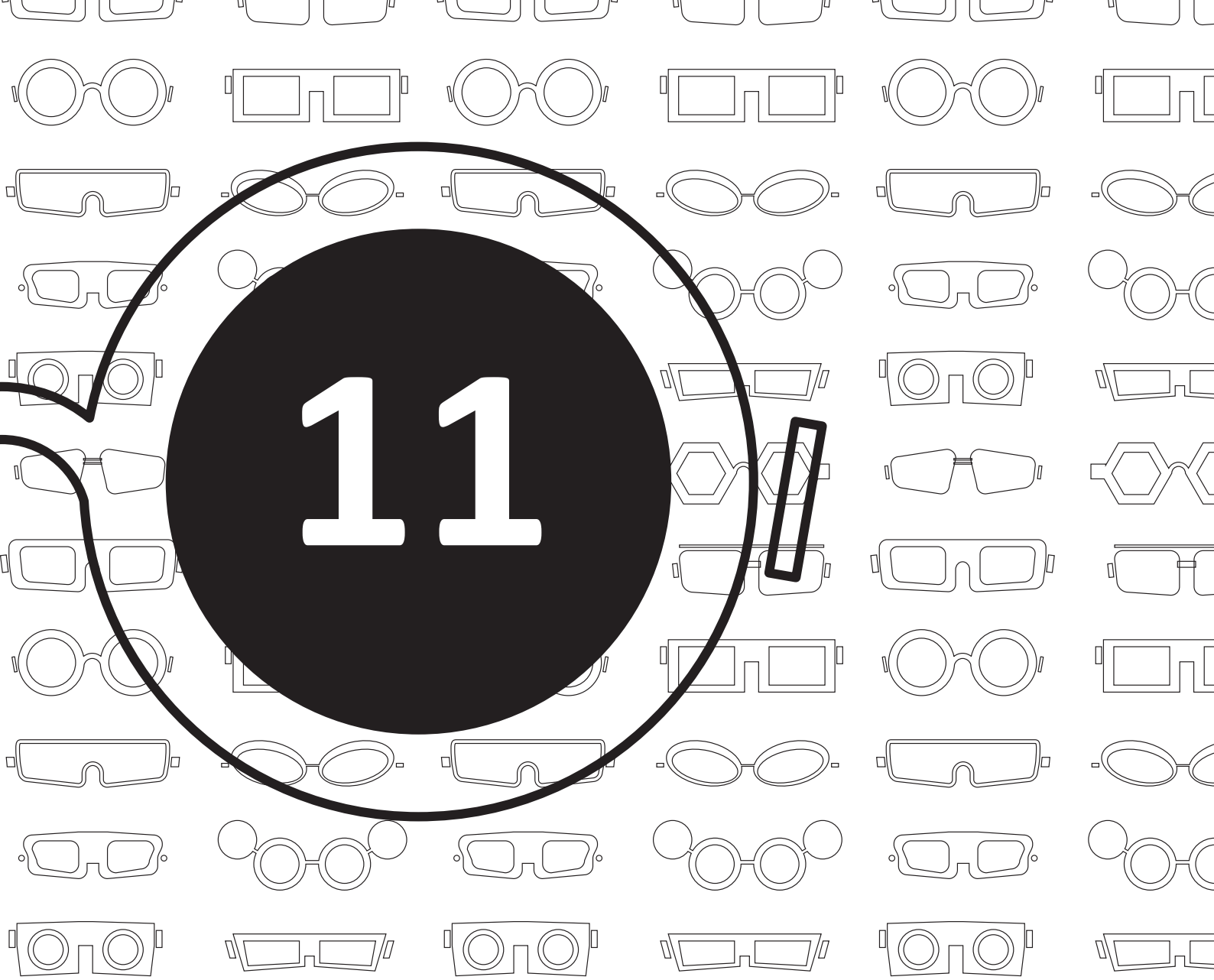

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Summary in Dutch

Doelen en belangrijkste bevindingen

Bij aanvang van het onderzoek in dit proefschrift was duidelijk dat motivatie voor behandeling wordt gezien als belangrijke voorspeller voor de uitkomsten van de psychiatrische behandeling van patiënten met een ernstige psychiatrische aandoening (EPA), zoals patiënten met een psychotische stoornis en/of ernstige persoonlijkheidsproblematiek. Echter, het was onduidelijk op welke (empirische) gronden de ene motivatietheorie boven de andere verkozen zou moeten worden om als basis te dienen voor motiverende interventies in de klinische praktijk. Het belangrijkste doel van het empirische onderzoek in dit proefschrift was daarom om drie motivatietheorieën te toetsen en vergelijken. Naar aanleiding van literatuuronderzoek (Hoofdstuk 2) werd beargumenteerd dat Zelf-Determinatie Theorie (ZDT)[48], het Transtheoretisch Model (TTM)[44] en het Integraal Model van Behandelmotivatie (IM)[37] allen een uniek maar complementair raamwerk boden op motivatie. In ZDT wordt onderscheid gemaakt tussen verschillende *kwaliteiten van motivatie*, variërend van minst geïnternaliseerd (externe motivatie) tot meest geïnternaliseerd (intrinsieke motivatie). Het TTM biedt een *raamwerk over de tijd* door onderscheid te maken tussen vijf fasen van verandering, waarbij elke fase volgens de theorie gepaard gaat met specifieke eigenschappen en benodigde interventies om naar een volgende fase over te gaan. Het IM maakt onderscheid tussen de *voorspellende factoren voor motivatie voor behandeling* en de effecten van motivatie op therapietrouw en behandeluitkomsten. Er werd een model samengesteld waarin enkele aannames werden gedaan over de relaties tussen de theorieën, waaruit specifieke onderzoeksvragen naar voren kwamen (Hoofdstuk 2). Deze vragen werden gebruikt als richtlijn voor de empirische onderzoeken in dit proefschrift. Als overkoepelend design werd gekozen voor een cluster-gerandomiseerde trial (Hoofdstuk 3). De trial had als hoofddoel om te toetsen of een Motivatie Feedback interventie effectief zou zijn in het verbeteren van de therapietrouw en klinische uitkomsten, en als nevendoel om de drie motivatietheorieën empirisch te toetsen op hun betrouwbaarheid, validiteit, plausibiliteit, robuustheid en voorspellende waarde.

Het toetsen van theorieën is gebaseerd op valide metingen van theoretische constructen en daarom werd eerst van elke theorie vastgesteld wat de psychometrische kwaliteiten waren van de theorie-specifieke vragenlijsten. Middels gebruik van structural equation modelling (SEM) werd vastgesteld dat de Nederlandse vertalingen van vragenlijsten voor ZDT voldoende betrouwbaar en valide waren voor gebruik in de populatie EPA (Hoofdstuk 4). Vervolgens werd ondersteuning gevonden voor hypothesen van ZDT, namelijk dat ondersteuning van autonomie en de ervaren zelf-effectiviteit in de behandeling voorspellend waren voor motivatie voor behandeling en klinische uitkomsten (therapietrouw, het psychosociaal functioneren en de kwaliteit van leven), waardoor deze theorie plausibel werd bevonden (Hoofdstuk 5). Daarnaast vonden we ondersteuning voor de robuustheid van de theorie, toen bleek dat ZDT stabiel was over de tijd en stabiel over verschillende diagnostische groepen van patiënten. Tot slot bleek ZDT circa 18-36% van de variantie in klinische uitkomsten te verklaren, waarmee de voorspellende waarde werd aangetoond.

Vergelijkbare toetsen werden uitgevoerd voor de toepasbaarheid van het IM (Hoofdstuk 6) en het TTM (Hoofdstuk 7) in de ambulante zorg van patiënten met EPA. Hoewel we vonden dat de – deels aangepaste – Nederlandse vragenlijst voor het meten van constructen van IM ook betrouwbaar en valide was, werden de hypothesen van de samenhang van deze constructen niet bevestigd, noch was het model robuust over tijd en diagnostische groepen. Hierdoor zijn er twijfels over de plausibiliteit en robuustheid van het IM in de doelgroep EPA. Desalniettemin waren de constructen van IM in staat om 22-88% van de variatie in klinische uitkomsten te verklaren, waardoor de voorspellende waarde aanzienlijk is. Betreft het TTM, werden twee verschillende methoden voor het meten van de fasen van verandering gebruikt om te bepalen welke methode het meest geschikt was voor gebruik in de klinische praktijk. Deze twee methoden bleken niet goed met elkaar overeen te komen, waardoor aannemelijk is dat zij niet hetzelfde construct 'fasen van verandering' meten. Daarnaast bleken de twee methoden slechts gedeeltelijk de verwachte verbanden te vertonen met andere constructen van het TTM en met therapietrouw. Hieruit volgt dat, als het construct van fasen niet goed gemeten kan worden, de validiteit ervan onder druk komt te staan. Hoewel beide meetinstrumenten wel robuust over de tijd en over diagnostische groepen bleken te zijn in hun samenhang met therapietrouw, verklaarden de TTM fasen van verandering slechts 3-16% van de variatie in klinische uitkomsten.

In de cluster-gerandomiseerde trial werd de effectiviteit onderzocht van Motivatie Feedback (MF); een interventie waarbij behandelaren en patiënten maandelijkse systematische metingen en gesprekken (uit)voerden over de motivatie voor

behandeling van de patiënt, gebaseerd op ZDT. MF werd aanvullend op de reguliere ambulante behandeling aangeboden, welke bestond uit psychiatrische zorg door multidisciplinaire teams genaamd Flexible Assertive Community Treatment teams. De hoofdhypothese van de trial was dat MF zou leiden tot meer bewustzijn van motivatie-processen in de behandeling, meer internalisatie van de motivatie van de patiënt, en zodoende tot betere therapietrouw in vergelijking met de reguliere behandeling alleen. Echter, na een jaar behandeling bleek er geen verschil te zijn tussen de twee groepen op therapietrouw, psychosociaal functioneren en kwaliteit van leven (Hoofdstuk 8). Een evaluatie van de interne validiteit van de trial, inclusief non-respons bias, informatie bias, problemen in de implementatie en de verschillende effecten op patiënten met een primair psychotische stoornis vergeleken met patiënten met primair persoonlijkheidsproblematiek, bood verklaringen waarom MF niet voldoende was om de uitkomsten te verbeteren. Opvallend was de bevinding dat behandelaren van mening waren dat de motivatie van hun patiënten minder extrinsiek was geworden door MF, terwijl patiënten dat zelf niet vonden. Dit geeft mogelijk aan dat MF er wel voor heeft gezorgd dat behandelaren meer inzicht hebben gekregen in de aard van de motivatie voor behandeling van hun patiënten, maar vervolgens niet in staat waren om dit (nog verder) te verbeteren zodat ook de therapietrouw en andere behandeluitkomsten gunstiger werden beïnvloed dan in de reguliere behandeling. Tot slot werd bevonden dat, op de baseline-meting, de mate waarin behandelaren in staat waren om de motivatie van hun patiënten in te schatten laag tot gemiddeld was (Hoofdstuk 9). We concluderen dat MF onvoldoende werkzaam is om motivatie en therapietrouw van patiënten met EPA te verbeteren, maar dat het wel zinvol is (MF te gebruiken) om een shared-decision making proces rondom de motivatie voor behandeling te hanteren zodat zowel de perspectieven van de behandelaar alsook van de patiënt expliciet worden overwogen bij het uitzetten van behandelbeleid.

Implicaties en aanbevelingen

Het meten van motivatie in de ambulante zorg van patiënten met EPA

Het kiezen van een meetinstrument voor de behandelmotivatie van een patiënt kan gebaseerd worden op een aantal overwegingen. Uit het onderzoek in dit proefschrift blijkt dat de mate van overeenstemming tussen patiënten en behandelaren niet geschikt is als criterium voor het kiezen van een instrument, gezien geen enkele theorie hierin duidelijk superieur was aan een andere theorie (Hoofdstuk 9). Andere criteria kunnen daarom leidend zijn bij de keuze, waaronder de duur van de meting, het type informatie dat uit de meting naar voren komt, de beschikbaarheid van normeringen en de overweging of de meting voor wetenschappelijk onderzoek bedoeld is of voor de beoordeling van een individu. Onze Nederlandse vertalingen van de Treatment Entry Questionnaire (TEQ, 18 items) en Health Care Climate Questionnaire (HCCQ, 15 items) kunnen gebruikt worden voor onderzoeksdoeleinden rondom ZDT, bijvoorbeeld om de kwaliteit van de motivatie te meten en de mate waarin de behandelaar als ondersteunend in de autonomie van de patiënt wordt ervaren. Het voordeel van deze instrumenten is dat zij relatief kort zijn t.o.v. de instrumenten van de andere theorieën. De Treatment Motivation Scales for Forensic patients (TMS-f), welke de constructen van het IM valide kan meten, werd deels aangepast voor de doeleinden van het huidige onderzoeksproject zodat het instrument ook buiten een forensisch psychiatrische setting gebruikt kan worden. De TMS-f heeft 85 items en heeft als voordeel dat er normen beschikbaar zijn vanuit een forensisch psychiatrische steekproef[160], maar als nadeel dat de afname vrij lang duurt en dat patiënten mogelijk geholpen moeten worden bij het invullen van de vragenlijst. Het meten van de vijf fasen van verandering van het TTM voor het veranderen van psychiatrische problemen gedurende de ambulante behandeling, bleek problematisch te zijn wanneer gebruik wordt gemaakt van de University of Rhode Island Change Assessment – Dutch version (URICA-D) of van een algoritme. Het gebruik van deze – klinisch populaire instrumenten – voor dergelijke doeleinden wordt daarom afgeraden. De URICA-D zou gebruikt kunnen worden in wetenschappelijk onderzoek bij patiënten met EPA, indien gebruik gemaakt wordt van de totaalscore van veranderingsbereidheid gezien deze als voldoende betrouwbaar en valide werd bevonden in het huidige onderzoek (i.t.t. de sub-schalen).

Verder zijn er nog enkele aandachtspunten betreft het kiezen van een methode voor het meten van motivatie, zoals beoordelingen door onafhankelijke observatoren, door behandelaren, door patiënten zelf of eventueel middels video-opnamen die achteraf gescoord kunnen worden door meerdere beoordelaars. Uit het huidige onderzoek blijkt dat behandelaren en patiënten een verschillende visie op motivatie van de patiënt hebben (m.a.w. zij vertonen geringe overeenstemming met elkaar), en dat de behandelaar niet altijd een goede inschatting kan maken van de visie van de patiënt op diens motivatie (Hoofdstuk 9). Vooral wanneer

de therapeutische relatie als 'goed' wordt gezien door de behandelaar, dan is de kans groter dat de behandelaar de motivatie van de patiënt ook hoog beoordeeld, iets wat 'halo-bias' [160,281] wordt genoemd. Echter, de motivatie van de patiënt voor de behandeling moet gezien worden als iets wat ook los kan staan van de therapeutische relatie, waarbij het mogelijk is dat een patiënt bijvoorbeeld wel erg gemotiveerd is om een steunend sociaal contact aan te gaan met de behandelaar maar weinig motivatie heeft om zijn/haar gedrag te veranderen. Deze bevindingen tonen het belang aan van een multi-methodische aanpak voor het meten van motivatie, waarbij alle perspectieven worden overwogen.

Interventies voor het optimaliseren van motivatie voor behandeling en gedragsverandering

Gezien ZDT als voldoende valide, plausibel, robuust en verklarend werd bevonden, ondersteunt dit het gebruik van ZDT als basis voor interventies in de ambulante zorg voor patiënten met EPA. De resultaten van de trial ontmoedigen het gebruik van de door ons ontwikkelde Motivatie Feedback in de ambulante zorg voor patiënten met EPA. Als toekomstig onderzoek verder inzicht oplevert in de essentiële mechanismen en moderatoren van motivatie en gedragsverandering in patiënten met EPA, dan kan er mogelijk ruimte zijn voor het gebruik van MF als een communicatie tool voor de behandelaar om het perspectief van de patiënt mee te verkennen en vervolgens hiermee rekening te houden bij het uitzetten van zorgbeleid. Potentieel effectieve interventies zouden kunnen bestaan uit een meer uitgebreide training en monitoring van behandelaren in het gebruik van ZDT, technieken van motiverende gespreksvoering die aansluiten op ZDT [191,225], rekening houden met problemen in (sociaal) cognitief functioneren van patiënten en verschillen tussen diagnostische groepen, als ook het gebruik van feedback componenten. Specifieke technieken die behandelaren kunnen inzetten voor het ondersteunen van de basisbehoeften aan autonomie, competentie en verbondenheid van patiënten zijn elders beschreven [65,123,212] en moeten mogelijk aangepast worden voor toepassing in de doelgroep EPA.

De andere twee motivatietheorieën bleken uitgebreider wetenschappelijk onderzoek te behoeven naar de betrouwbaarheid en validiteit van theoretische constructen (TTM) en de plausibiliteit en robuustheid (TTM en IM) van hun raamwerk, alvorens toepassingen in klinisch trials en de praktijk kunnen worden overwogen. Betreft het IM werd bevonden dat het geen plausibel noch robuust raamwerk is voor patronen waardoor patiënten gemotiveerd worden/zijn voor behandeling, maar dat de theoretische constructen wel valide zijn en in substantiële mate verklarend zijn voor therapietrouw en klinische uitkomsten. Dit laatste toont aan dat het IM op termijn wel relevant en zinvol kan zijn in de klinische praktijk. Betreft het TTM werd in dit proefschrift, alsmede ook in eerdere kritische reviews over het TTM in andere gezondheidssettingen[79,80,88,99], bevonden dat het model weinig praktische waarde kan hebben als diens theoretische constructen niet accuraat gedefinieerd zijn en onvoldoende betrouwbaar en valide gemeten kunnen worden. Hierdoor zijn er sterke twijfels of de vijf fasen van verandering wel reële entiteiten zijn. Toekomstige studies naar het TTM in patiënten met EPA zouden andere instrumenten voor de fasen kunnen (ontwikkelen en) testen, ofwel een alternatief raamwerk voor het TTM kunnen overwegen (zoals getoond in Figuur 4 van Hoofdstuk 10). Wij stellen in ons alternatieve raamwerk voor TTM voor dat de heuristische waarde van het model, die zo gewaardeerd wordt in de klinische praktijk, behouden blijft door rekening te houden met het cyclische proces van verandering terwijl er anderzijds erkend wordt dat er substantiële problemen zijn met het construct van de fasen, zowel in wetenschappelijk onderzoek als de klinische praktijk.

Het door ons voorgestelde model van de samenhang tussen de drie motivatietheorieën (Figuur 4, Hoofdstuk 10) kan gebruikt worden als basis voor een geïntegreerde aanpak van motivatie in de ambulante zorg voor patiënten met EPA. Dit model kan eerst als leidraad dienen voor vervolgonderzoek, waarna het mogelijk ingezet kan worden om de ontwikkeling en het gebruik van klinische interventies vorm te geven.

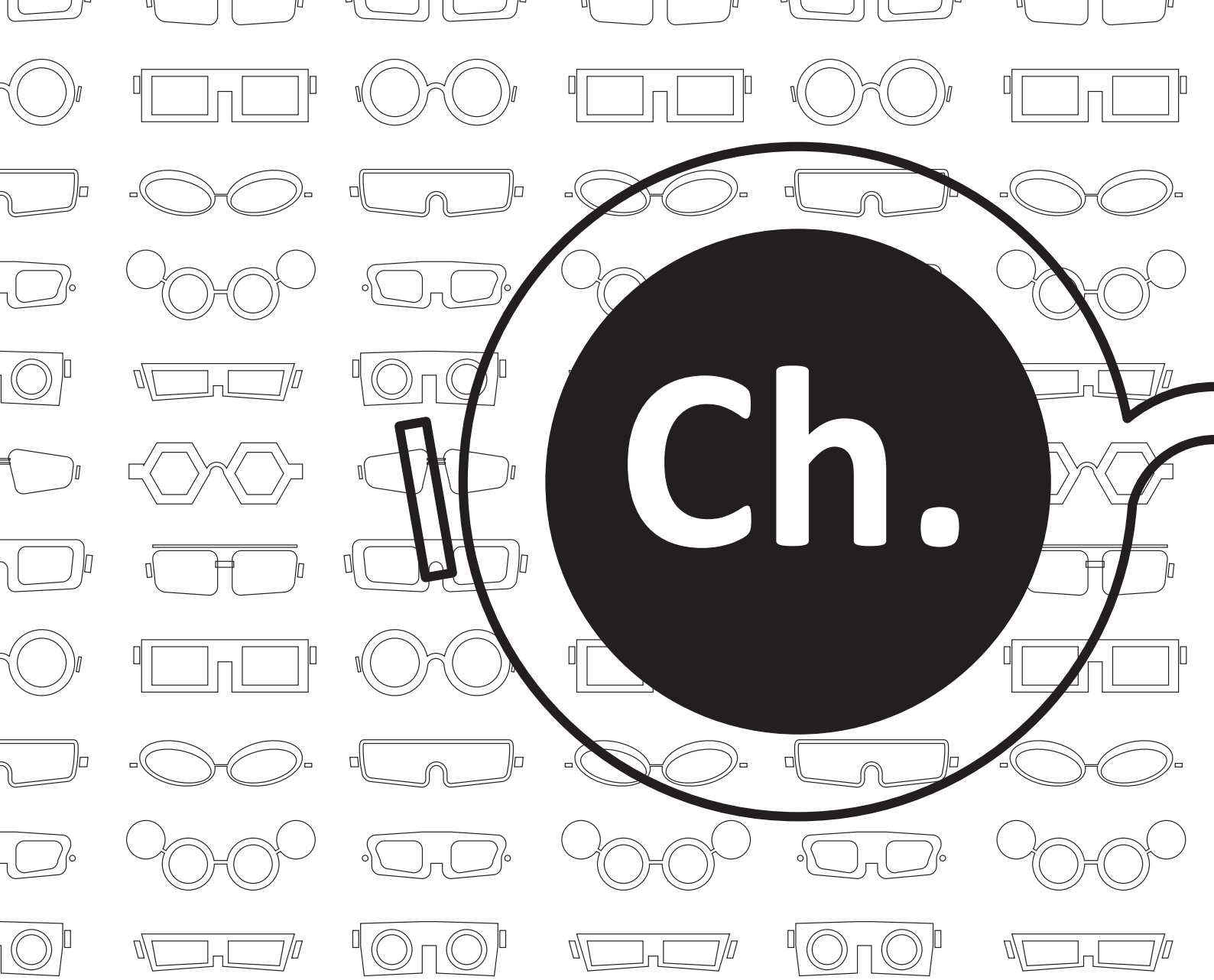
Toekomstig onderzoek naar motivatie in ambulante patiënten met EPA

Onze hoop is dat het empirische onderzoek in dit proefschrift andere onderzoekers zal inspireren om studies te ontwerpen en uit te voeren naar het testen van meerdere (motivatie)theorieën tegelijkertijd. Zodoende kunnen deze theorieën geëvalueerd en vergeleken worden, en hierdoor de theorie en praktijk voor patiënten met EPA dichter bij elkaar brengen. Zoals eerder gemeld, kan het door ons voorgestelde geïntegreerde model (Figuur 4, Hoofdstuk 10) gebruikt worden om hypothesen over de samenhang tussen de drie motivatietheorieën op een klinisch-empirische wijze te toetsen. Onderzoekers kunnen echter ook besluiten om andere motivatietheorieën of theorieën over gezondheidsgedrag te vergelijken,

waarin bijvoorbeeld explicieter biologische factoren worden overwogen of een (breder) perspectief vanuit de organisatie of maatschappelijke context van de gezondheidszorg.

De ontwikkeling en evaluatie van meetinstrumenten verdient aandacht in toekomstig onderzoek, omdat het op een betrouwbare en valide wijze kunnen meten van theoretische constructen de basis is voor het bouwen en toetsen van theorieën. Dergelijke studies kunnen zich richten op het optimaal verkorten van vragenlijsten zodat ze toegepast kunnen worden in de klinische praktijk voor patiënten met EPA, en hierbij meerdere informatiebronnen en methoden overwegen voor dergelijke metingen. Hierbij zou een multitrait-multimethod aanpak middels structural equation modelling behulpzaam kunnen zijn.

Onderzoek binnen theorieën zou zich moeten richten op het verder onderzoeken van modellen in ambulante patiënten met EPA, bij voorkeur door gebruik te maken van longitudinale monitoring (en cross-lagged analyses) van theoretische constructen. Hierdoor wordt het mogelijk om meer uitgebreide modellen te maken die meer inzicht kunnen bieden in veranderingsprocessen in deze doelgroep. De meest essentiële en krachtige constructen kunnen zo geïdentificeerd worden, die vervolgens doelgericht in interventies aangepakt kunnen worden (en onderzocht middels klinische gerandomiseerde trials). Een analytische aanpak waarbij ook gekeken wordt naar de gecombineerde effecten van theoretische constructen, bijv. combinaties van hoge en lage autonomie en competenties of hoge scores op alle typen motivatie vergeleken met andere “motivatieprofielen”, zou informatief kunnen zijn. Hierdoor kan onderzocht worden of er bepaalde additieve, synergistische, antagonistische of andere effecten zijn tussen de theoretische constructen in een theorie. Het detecteren van moderatoren en synergistische effecten kan belangrijke implicaties hebben voor het optimaliseren van het design en de uitvoering van toekomstige interventies. Uiteindelijk zal experimenteel onderzoek nodig zijn om de causaliteit van de relaties tussen de constructen, en hun vermogen om klinische uitkomsten gunstig te beïnvloeden, vast te stellen (danwel te falsifiëren).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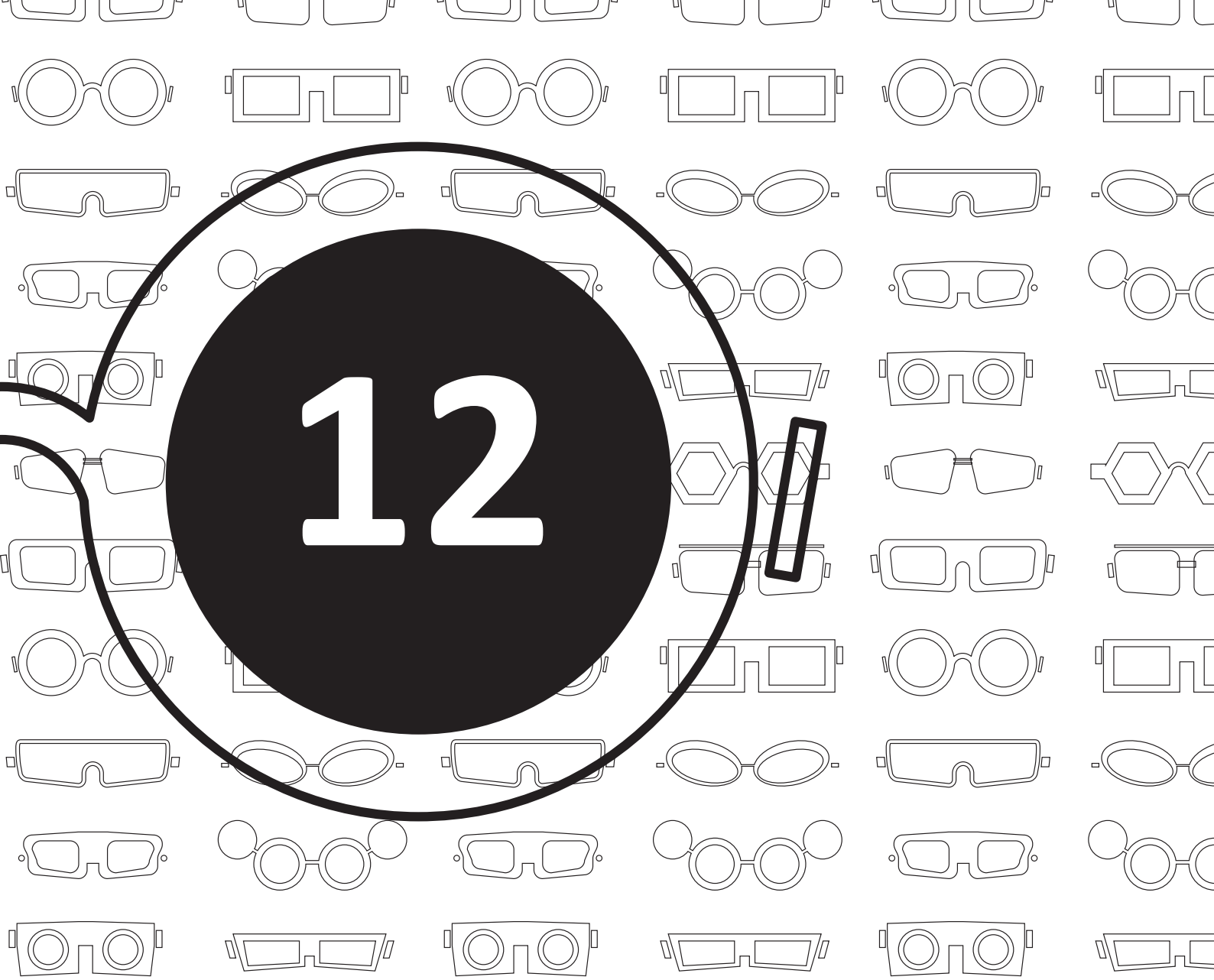


References

1. Insel T. Director's blog: Getting serious about mental illnesses. [Internet]. 2013; http://www.nimh.nih.gov/about/director/2013/getting-serious-about-mental-illnesses.shtml.
2. Grohol JM. The Lie of Focusing on Those with Serious Mental Illness. 2014; http://psychcentral.com/blog/archives/2014/04/17/the-lie-of-focusing-on-those-with-serious-mental-illness/, 2015.
3. Slade M, Powell R, Strathdee G. Current approaches to identifying the severely mentally ill. *Soc Psychiatry Psychiatr Epidemiol.* 1997;32(4):177-184.
4. National_Institute_of_Mental_Health. *Towards a Model for a Comprehensive Community-Based Mental Health System.* . Washington, DC: NIMH;1987.
5. Schinnar AP, Rothbard AB, Kanter R, Jung YS. An empirical literature review of definitions of severe and persistent mental illness. *Am J Psychiatry.* 1990;147(12):1602-1608.
6. Ruggeri M, Leese M, Thornicroft G, Bisoffi G, Tansella M. Definition and prevalence of severe and persistent mental illness. *Br J Psychiatry.* 2000;177:149-155.
7. Parabiaghi A, Bonetto C, Ruggeri M, Lasalvia A, Leese M. Severe and persistent mental illness: a useful definition for prioritizing community-based mental health service interventions. *Soc Psychiatry Psychiatr Epidemiol.* 2006;41(6):457-463.
8. Jones DR, Macias C, Barreira PJ, Fisher WH, Hargreaves WA, Harding CM. Prevalence, severity, and co-occurrence of chronic physical health problems of persons with serious mental illness. *Psychiatr Serv.* 2004;55(11):1250-1257.
9. Delespaul P. Consensus over de definitie van mensen met een ernstige psychiatrische aandoening (EPA) en hun aantal in Nederland. *Tijdschr Psychiatr.* 2013;55(6):427-438.
10. van Veldhuizen R. FACT wijkteams vernieuwen sociale psychiatrie [FACT community mental health teams renew social psychiatry]. *Psychopraktijk.* 2012;4(2):19-23.
11. van Os J, Linscott RJ, Myin-Germeys I, Delespaul P, Krabbendam L. A systematic review and meta-analysis of the psychosis continuum: evidence for a psychosis proneness-persistence-impairment model of psychotic disorder. *Psychol Med.* 2009;39(2):179-195.
12. Sansone RA, Sansone LA. Personality disorders: a nation-based perspective on prevalence. *Innov Clin Neurosci.* 2011;8(4):13-18.
13. Lenzenweger MF, Lane MC, Loranger AW, Kessler RC. DSM-IV personality disorders in the National Comorbidity Survey Replication. *Biol Psychiatry.* 2007;62(6):553-564.
14. van Veldhuizen JR. FACT: a Dutch version of ACT. *Community Ment Health J.* 2007;43(4):421-433.
15. Drake RE, Goldman HE, Leff H, et al. Implementing evidence-based practices in routine mental health service settings. *Psychiatr Serv.* 2001;52(2):179-182.
16. Kroon H. Ambulantiseren in Nederland. 2013; http://www.ambulantisering.nl/.
17. Kortrijk H, Mulder C, Roosenschoon B, Wiersma D. Treatment outcome in patients receiving assertive community treatment. *Community Ment Health J.* 2010;46(4):330-336.
18. Koekkoek B. *Ambivalent connections: Improving community mental health care for non-psychotic chronic patients perceived as 'difficult'* [Doctoral dissertation]: Social Sciences, Radboud University Nijmegen; 2011.
19. Kreyenbuhl J, Nossel IR, Dixon LB. Disengagement From Mental Health Treatment Among Individuals With Schizophrenia and Strategies for Facilitating Connections to Care: A Review of the Literature. *Schizophrenia Bulletin.* 2009;35(4):696-703.
20. Velligan DI, Weiden PJ, Sajatovic M, et al. Assessment of adherence problems in patients with serious and persistent mental illness: recommendations from the Expert Consensus Guidelines. *Journal of Psychiatric Practice.* 2010;16(1):34-45.
21. Staring ABP, Mulder CL, Van der Gaag M, Selten JP, Lonnen AJM, Hengeveld MW. Understanding and improving treatment adherence in patients with psychotic disorders: A review and proposed intervention. *Curr Psych Rev.* 2006;2(4):487-494.
22. Weiss KA, Smith TE, Hull JW, Piper AC, Huppert JD. Predictors of risk of nonadherence in outpatients with schizophrenia and other psychotic disorders. *Schizophr Bull.* 2002;28(2):341-349.
23. McMurran M, Huband N, Overton E. Non-completion of personality disorder treatments: a systematic review of correlates, consequences, and interventions. *Clin Psychol Rev.* 2010;30(3):277-287.
24. Lehner RK, Dopke CA, Cohen K, et al. Outpatient treatment adherence and serious mental illness: A review of interventions. *Am J Psychiatr Rehabil.* 2007;10(4):245-274.
25. Torrey EF, Zdanowicz M. Outpatient commitment: What, why and for whom. *Psychiatr Serv.* 2001;52:337-341.
26. Delaney C. Reducing recidivism: medication versus psychosocial rehabilitation. *Journal of Psychosocial Nursing and Mental Health Services.* 1998;36(11):28-34.
27. Barkhof E, Meijer CJ, de Sonneville LM, Linszen DH, de Haan L, de Sonneville LMJ. Interventions to improve adherence to antipsychotic medication in patients with schizophrenia--a review of the past decade. *European Psychiatry: the Journal of the Association of European Psychiatrists.* 2012;27(1):9-18.
28. Barrett MS, Chua WJ, Crits-Christoph P, Gibbons MB, Casiano D, Thompson D. Early Withdrawal from Mental Health Treatment: Implications for Psychotherapy Practice. *Psychotherapy.* 2008;45(2):247-267.
29. Centorrino F, Hernan MA, Drago-Ferrante G, et al. Factors Associated With Noncompliance With Psychiatric Outpatient Visits. *Psychiatr Serv.* 2001;52(3):378-380.
30. Hofmann SG, Asnaani A, Vonk IJ, Sawyer AT, Fang A. The Efficacy of Cognitive Behavioral Therapy: A Review of Meta-analyses. *Cognit Ther Res.* 2012;36(5):427-440.
31. Wampold BE. How important are the common factors in psychotherapy? An update. *World Psychiatry.* 2015;14(3):270-277.

32. Bohart AC. The Client Is the Most Important Common Factor: Clients' Self-Healing Capacities and Psychotherapy. *Journal of Psychotherapy Integration.* 2000;10(2):127-149.
33. Weinberger J. Common factors are not so common and specific factors are not so specified: toward an inclusive integration of psychotherapy research. *Psychotherapy (Chic).* 2014;51(4):514-518.
34. Laska KM, Gurman AS, Wampold BE. Expanding the lens of evidence-based practice in psychotherapy: a common factors perspective. *Psychotherapy (Chic).* 2014;51(4):467-481.
35. Ryan RM, Plant RW, O'Malley S. Initial motivations for alcohol treatment: Relations with patient characteristics, treatment involvement, and dropout. *Addict Behav.* 1995;20(3):279-297.
36. Mulder CL, Koopmans GT, Hengeveld MW. Lack of motivation for treatment in emergency psychiatry patients. *Social Psychiatry and Psychiatric Epidemiology.* 2005;40(6):484-488.
37. Drieschner KH, Lammers SMM, van der Staak CPF. Treatment motivation: An attempt for clarification of an ambiguous concept. *Clin Psychol Rev.* 2004;23(8):1115-1137.
38. McConnaughy EA, Prochaska JO, Velices WF. Stages of change in psychotherapy: Measurement and sample profiles. *Psychotherapy: Theory, Research and Practice.* 1983;20(3):368-375.
39. Knaup C, Koesters M, Schoefer D, Becker T, Puschner B. Effect of feedback of treatment outcome in specialist mental healthcare: meta-analysis. *Br J Psychiatry.* 2009;195(1):15-22.
40. Kleinginna PR, Kleinginna AM. A categorized list of motivation definitions, with a suggestion for a consensual definition. *Motivation and Emotion.* 1981;5(3):263-291.
41. McClelland DC. *Human Motivation.* Cambridge: Cambridge University Press; 1987.
42. Graham S, Weiner B. Theories and principles of motivation. In: Calfee DCBRC, ed. *Handbook of Educational Psychology*. New York: Macmillan; 1996:63-84.
43. Davis R, Campbell R, Hildon Z, Hobbs L, Michie S. Theories of behaviour and behaviour change across the social and behavioural sciences: a scoping review. *Health Psychol Rev.* 2014:1-22.
44. Prochaska JO, DiClemente CC. Stages and processes of self-change in smoking: toward an integrative model of change. *Journal of Consulting and Clinical Psychology.* 1983;5:390-395.
45. Ajzen I. The theory of planned behavior. *Organizational Behavior and Human Decision Processes.* 1991;50(2):179-211.
46. Bandura A. *Social foundations of thought and action.* Englewood Cliffs, New Jersey: Prentice-Hall; 1986.
47. Rosenstock IM. Historical Origins of the Health Belief Model. *Health Education & Behavior* 1974;2(4):328-335.
48. Deci EL, Ryan RM. The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry: An International Journal for the Advancement of Psychological Theory.* 2000;11(4):227 - 268.
49. Sapyta J, Riemer M, Bickman L. Feedback to clinicians: theory, research, and practice. *Journal of Clinical Psychology.* 2005;61(2):145-153.
50. Ory MG, Jordan PJ, Bazzarre T. The Behavior Change Consortium: setting the stage for a new century of health behavior-change research. *Health Education Research.* 2002;17(5):500-511.
51. Riemer M, Bickman L. Using program theory to link social psychology and program evaluation. In: Mark MM, Donaldson SI, Campbell B, eds. *Social psychology and evaluation*. New York, NY: Guilford Press; 2011.
52. Tierney DW, McCabe MP. The validity of the trans-theoretical model of behaviour change to investigate motivation to change among child molesters. *Clinical Psychology and Psychotherapy.* 2001;8:176-190.
53. DiClemente CC, Schlundt D, Gemmell L. Readiness and stages of change in addiction treatment. *The American Journal on Addictions.* 2004;13(2):103-119.
54. Prochaska JO, Redding CA, Evers KE. The transtheoretical model and stages of change. In: Glanz K, Rimer BK, Viswanath K, eds. *Health behavior and health education: Theory, research and practice.* Vol 4. San Francisco: Jossey-Bass; 2008:97-121.
55. Prochaska JO, DiClemente CC, Norcross JC. In Search of How People Change: Applications to Addictive Behaviors. *Journal of Addictions Nursing.* 1992;5(1):2-16.
56. Drake RE, Mueser KT. Psychosocial approaches to dual diagnosis. *Schizophr Bull.* 2000;26(1):105-118.
57. Nidecker M, DiClemente CC, Bennett ME, Bellack AS. Application of the Transtheoretical Model of change: psychometric properties of leading measures in patients with co-occurring drug abuse and severe mental illness. *Addict Behav.* 2008;33(8):1021-1030.
58. DiClemente CC, Nidecker M, Bellack AS. Motivation and the stages of change among individuals with severe mental illness and substance abuse disorders. *J Subst Abuse Treat.* 2008;34(1):25-35.
59. Brunette MF, Mueser KT. Psychosocial interventions for the long-term management of patients with severe mental illness and co-occurring substance use disorder. *J Clin Psychiatry.* 2006;67 Suppl 7:10-17.
60. Bezyak JL. Stages of change and physical activity among individuals with severe mental illness. *Dissertation Abstracts International.* 2009;69(9-B):5766.
61. Bassilios B, Judd F, Pattison P, Nicholas A, Moeller-Saxone K. Predictors of exercise in individuals with schizophrenia: A test of the transtheoretical model of behavior change. *Clin Schizophr Relat Psychoses.* 2015;8(4):173-182, 182A.
62. Soler J, Trujols J, Pascual JC, et al. Stages of change in dialectical behaviour therapy for borderline personality disorder. *Br J Clin Psychol.* 2008;47(Pt 4):417-426.
63. Norcross JC, Krebs PM, Prochaska JO. Stages of change. *J Clin Psychol.* 2011;67(2):143-154.

64. Deci EL, Eghrari H, Patrick BC, Leone DR. Facilitating Internalization: The Self-Determination Theory Perspective. *J Pers.* 1994;62(1):119-142.
65. Ryan RM, Deci EL. A Self-Determination Theory Approach to Psychotherapy: The Motivational Basis for Effective Change. *Can Psychol.* 2008;49(3):186-193.
66. Nakagami E, Hoe M, Brekke JS. The prospective relationships among intrinsic motivation, neurocognition, and psychosocial functioning in schizophrenia. *Schizophrenia Bulletin.* 2010;36(5):935-948.
67. Gard DE, Sanchez AH, Starr J, et al. Using self-determination theory to understand motivation deficits in schizophrenia: the 'why' of motivated behavior. *Schizophr Res.* 2014;156(2-3):217-222.
68. Barch DM, Yodkovik N, Sypher-Locke H, Hanewinkel M. Intrinsic Motivation in Schizophrenia: Relationships to Cognitive Function, Depression, Anxiety, and Personality. *Journal of Abnormal Psychology.* 2008;117(4):776-787.
69. Yamada A-MP, Lee KKL, Dinh TQP, Barrio CP, Brekke JSP. Intrinsic Motivation as a Mediator of Relationships Between Symptoms and Functioning Among Individuals With Schizophrenia Spectrum Disorders in a Diverse Urban Community. [Article]. *Journal of Nervous & Mental Disease* 2010;198(1):28-34.
70. Choi J, Mogami T, Medalia A. Intrinsic Motivation Inventory: An Adapted Measure for Schizophrenia Research. *Schizophrenia Bulletin.* 2010;36(5):966-976.
71. Choi J, Medalia A. Intrinsic motivation and learning in a schizophrenia spectrum sample. *Schizophr Res.* 2010;118(1-3):12-19.
72. Tas C, Brown EC, Aysen E, Lysaker PH, Brune M. Intrinsic motivation and metacognition as predictors of learning potential in patients with remitted schizophrenia. *Journal of Psychiatric Research.* 2012;46:1086-1092.
73. Medalia A, Brekke J. In search of a theoretical structure for understanding motivation in schizophrenia. *Schizophrenia Bulletin.* 2010;36(5):912-918.
74. Ryan RM. The developmental line of autonomy in the etiology, dynamics, and treatment of borderline personality disorders. *Development and Psychopathology.* 2005;17(4):987-1006.
75. Noar SM, Zimmerman RS. Health Behavior Theory and cumulative knowledge regarding health behaviors: are we moving in the right direction? *Health Education Research.* 2005;20(3):275-290.
76. Weinstein ND, Rothman AJ. Commentary: Revitalizing research on health behavior theories. *Health Education Research.* 2005;20(3):294-297.
77. Weinstein ND. Misleading tests of health behavior theories. *Annals of Behavioral Medicine.* 2007;33(1):1-10.
78. West R. Time for a change: putting the Transtheoretical (Stages of Change) Model to rest. *Addiction.* 2005;100(8):1036-1039.
79. Littell JH, Girvin H. Stages of Change: A critique. *Behavior Modification.* 2002;26(2):223-273.
80. Guo B, Aveyard P, Fielding A, Sutton S. Do the Transtheoretical Model processes of change, decisional balance and temptation predict stage movement? Evidence from smoking cessation in adolescents. *Addiction.* 2009;104(5):828-838.
81. Weinstein ND, Rothman AJ, Sutton S. Stage Theories of Health Behavior: Conceptual and Methodological Issues. *Health Psychology.* 1998;17(3):290-299.
82. Deci EL, Ryan RM. Self-Determination Theory: A Macrotheory of Human Motivation, Development, and Health. *Can Psychol.* 2008;49(3):182-185.
83. Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. *American Journal of Health Promotion.* 1997;12(1):38-48.
84. Prochaska JO. Decision making in the transtheoretical model of behavior change. *Medical Decision Making.* 2008;28(6):845-849.
85. Buckley PF, Wirshing DA, Bhushan P, Pierre JM, Resnick SA, Wirshing WC. Lack of insight in schizophrenia: impact on treatment adherence. *CNS Drugs.* 2007;21(2):129-141.
86. Jochems EC, Mulder CL, van Dam A, Duivenvoorden HJ. A critical analysis of the utility and compatibility of motivation theories in psychiatric treatment. *Curr Psych Rev.* 2011;7(4):298-312.
87. Wright JA, Velicer WF, Prochaska JO. Testing the predictive power of the transtheoretical model of behavior change applied to dietary fat intake. *Health Education Research.* 2009;24(2):224-236.
88. Sutton S. Back to the drawing board? A review of applications of the transtheoretical model to substance use. *Addiction.* 2001;96(1):175-186.
89. Wilson GT, Schlam TR. The transtheoretical model and motivational interviewing in the treatment of eating and weight disorders. *Clin Psychol Rev.* 2004;24(3):361-378.
90. Sutton S. Can "stages of change" provide guidance in the treatment of addictions? A critical examination of Prochaska and DiClemente's model. In: Edwards G, Dare C, eds. *Psychotherapy, psychological treatments and the addictions*. Cambridge, UK: Cambridge University Press; 1996:189-205.
91. Rollnick S, Heather N, Gold R, Hall W. Development of a short 'readiness to change' questionnaire for use in brief, opportunistic interventions among excessive drinkers. *British Journal of Addiction.* 1992;87(5):743-754.
92. Simpson DD, Joe GW. Motivation as a predictor of early dropout from drug abuse treatment. *Psychotherapy.* 1993;30(2):357-368.
93. Hodgins D. Stages of Change Assessments in Alcohol Problems: Agreement Across Self- and Clinician-Reports. *Substance Abuse.* 2001;22(2):87-96.
94. Prochaska JO. Moving beyond the transtheoretical model. *Addiction.* 2006;101(6):768-774.
95. Velicer WF, DiClemente CC, Prochaska JO, Brandenburg N. Decisional balance measure for assessing and predicting smoking status. *J Pers Soc Psychol.* 1985;48(5):1279-1289.

96. Prochaska JO, Velicer WF, DiClemente CC, Fava JL. Measuring processes of change: applications to the cessation of smoking. *Journal of Consulting and Clinical Psychology.* 1988;56(4):520-528.
97. Dunlap SK. Internalization: A related process to stages-of-change among participants in a court-mandated substance abuse program. *Dissertation Abstracts International.* 2010;70(7):4480-B.
98. DiClemente CC. Conceptual Models and Applied Research: The Ongoing Contribution of the Transtheoretical Model. *Journal of Addictions Nursing.* 2005;16(1-2):5-12.
99. Hutchison AJ, Breckon JD, Johnston LH. Physical activity behavior change interventions based on the transtheoretical model: A systematic review. *Health Education & Behavior.* 2009;36(5):829-845.
100. Rogers E, Martin R, Anthony W, et al. Assessing readiness for change among persons with severe mental illness. *Community Ment Health J.* 2001;37(2):97-112.
101. Pantalon MV, Swanson AJ. Use of the University of Rhode Island Change Assessment to Measure Motivational Readiness to Change in Psychiatric and Dually Diagnosed Individuals. *Psychology of Addictive Behaviors.* 2003;17(2):91-97.
102. Gorczynski P, Faulkner G, Greening S, Cohn T. Exploring the construct validity of the Transtheoretical Model to structure physical activity interventions for individuals with serious mental illness. *Psychiatric Rehabilitation Journal.* 2010;34(1):61-64.
103. Tsang HW-h, Fung KM-t, Chung RC-k. Self-stigma and stages of change as predictors of treatment adherence of individuals with schizophrenia. *Psychiatry Research.* 2010;180(1):10-15.
104. Velasquez MM, Carbonari JP, Diclemente CC. Psychiatric severity and behavior change in alcoholism: The relation of the transtheoretical model variables to psychiatric distress in dually diagnosed patients. *Addictive Behaviors.* 1999;24(4):481-496.
105. Hagedorn HJ. Application of the transtheoretical model of behavior change to cessation of alcohol use in patients with schizophrenia. *Dissertation Abstracts International.* 2000;61(3-B):1635.
106. Carey KB, Purnine DM, Maisto SA, Carey MP. Correlates of Stages of Change for Substance Abuse Among Psychiatric Outpatients. *Psychology of Addictive Behaviors December.* 2002;16(4):283-289.
107. Martino F, Menchetti M, Pozzi E, Berardi D. Predictors of dropout among personality disorders in a specialist outpatients psychosocial treatment: a preliminary study. *Psychiatry Clin Neurosci.* 2012;66(3):180-186.
108. Project MATCH Research Group A. Matching Alcoholism Treatments to Client Heterogeneity: Project MATCH Three-Year Drinking Outcomes. *Alcoholism: Clinical & Experimental Research.* 1998;22(6):1300.
109. Walters GD. Lessons Learned From Project MATCH. *Addictive Disorders & Their Treatment.* 2002;1(4):135-139.
110. Duijsens IJ, Spinhoven P, Goekoop JG, Spermon T, Eurelings-Bontekoe EH. The Dutch Temperament and Character Inventory (TCI): Dimensional structure, reliability and validity in a normal and psychiatric outpatient sample. *Personality and Individual Differences.* 2000;28(3):pp.
111. Bridle C, Riemsma RP, Pattenden J, et al. Systematic review of the effectiveness of health behavior interventions based on the transtheoretical model. *Psychology & Health.* 2005;20(3):283 - 301.
112. Duijsens IJ, Spinhoven P. *TCI Handleiding. Handleiding van de Nederlandse Temperament en Karakter Vragenlijst.* Leiderdorp: Datec; 2000.
113. Patterson DA, Wolf S, Buckingham SL. Does motivational interviewing stages of change increase treatment retention among persons who are alcohol and other drug dependent and HIV infected? *Journal of HIV/AIDS & Social Services.* 2010;9(1):45-57.
114. Conner M, Norman P. Comparing the health belief model and the theory of planned behavior in health screening. In: Rutter DR, Quiine L, eds. *Social Psychology and Health: European Perspectives*. Brookfield: Avebury/Ashgate; 1994:1-24.
115. Sutton S. How does the Health Action Process Approach (HAPA) bridge the intention-behavior gap? An examination of the model's causal structure. *Applied Psychology: An International Review.* 2008;57(1):66-74.
116. Drieschner KH, Boomsma A. Validation of the Treatment Motivation Scales for Forensic outpatient treatment (TMS-F). *Assessment.* 2008;15(2):242-255.
117. Drieschner KH, Verschuur J. Treatment engagement as a predictor of premature treatment termination and treatment outcome in a correctional outpatient sample. *Criminal Behaviour and Mental Health.* 2010;20(2):86-99.
118. Drieschner KH, Boomsma A. The Treatment Motivation Scales for forensic outpatient treatment (TMS-F): construction and psychometric evaluation. *Assessment.* 2008;15(2):224-241.
119. Drieschner KH, Boomsma A. The Treatment Engagement Rating scale (TER) for forensic outpatient treatment: Description, psychometric properties, and norms. *Psychology, Crime & Law.* 2008;14(4):299 - 315.
120. Burke BL, Arkowitz H, Menchola M. The Efficacy of Motivational Interviewing: A Meta-Analysis of Controlled Clinical Trials. *J Consult Clin Psychol.* 2003;71(5):843-861.
121. Drymalski WM, Campbell TC. A review of Motivational Interviewing to enhance adherence to antipsychotic medication in patients with schizophrenia: Evidence and recommendations. *J Ment Health.* 2009;18(1):6-15.
122. Martino S. Contemplating the use of motivational interviewing with patients who have schizophrenia and substance use disorders. *Clinical Psychology: Science and Practice.* 2007;14(1):58-63.
123. Ryan RM, Patrick H, Deci EL, Williams GC. Facilitating health behaviour change and its maintenance: Interventions based on Self-Determination Theory. *The European Health Psychologist.* 2008;10:2-5.

124. Zeldman A, Ryan RM, Fiscella K. Motivation, autonomy support, and entity beliefs: Their role in methadone maintenance treatment. *Journal of Social and Clinical Psychology.* 2004;23(5):675-696.
125. Ferron JC. Psychological mechanisms to treatment adherence among people with severe mental illness: Validating treatment motivation and working alliance measures (PhD dissertation). *Dissertation Abstracts International.* 2007;68(11-A):4863.
126. Wild T, Cunningham JA, Ryan RM. Social pressure, coercion, and client engagement at treatment entry: A self-determination theory perspective. *Addict Behav.* 2006;31(10):1858-1872.
127. Kennedy K, Gregoire TK. Theories of motivation in addiction treatment: Testing the relationship of the transtheoretical model of change and self-determination theory. *Journal of Social Work Practice in the Addictions.* 2009;9(2):163-183.
128. Zuroff DC, Koestner R, Moskowitz D, McBride C, Marshall M, Bagby M. Autonomous motivation for therapy: A new common factor in brief treatments for depression. *Psychotherapy Research.* 2007;17(2):137-147.
129. Pelletier LG, Tuson KM, Haddad NK. Client Motivation for Therapy Scale: A Measure of Intrinsic Motivation, Extrinsic Motivation, and Amotivation for Therapy. *Journal of Personality Assessment.* 1997;68(2):414 - 435.
130. Dwyer LA, Hornsey MJ, Smith LG, Oei TP, Dingle GA. Participant autonomy in cognitive behavioral group therapy: An integration of self-determination and cognitive behavioral theories. *Journal of Social and Clinical Psychology.* 2011;30(1):24-46.
131. Markland D, Ryan RM, Tobin VJ, Rollnick S. Motivational interviewing and self-determination theory. *Journal of Social and Clinical Psychology.* 2005;24(6):811-831.
132. Williams GC, Deci EL. Activating patients for smoking cessation throiugh physician autonomy support. *Medical Care.* 2001;39(8):813-823.
133. Williams GC, Gagné M, Ryan RM, Deci EL. Facilitating autonomous motivation for smoking cessation. *Health Psychology.* 2002;21(1):40-50.
134. Williams GC, Grow VM, Freedman ZR, Ryan RM, Deci EL. Motivational predictors of weight-loss and weight-loss maintenance. *J Pers Soc Psychol.* 1996;70:115-126.
135. Williams GC, McGregor HA, Zeldman A, Freedman ZR, Deci EL. Testing a self-determination theory process model for promoting glycemic control through diabetes self-management. *Health Psychology.* 2004;23:58-66.
136. Williams GC, Rodin GC, Ryan RM, Grolnick WS, Deci EL. Autonomous motivation and long-term medication adherence in adult outpatients. *Health Psychology.* 1998;17:269-276.
137. Prochaska JO, Wright JA, Velicer WF. Evaluating Theories of Health Behavior Change: A Hierarchy of Criteria Applied to the Transtheoretical Model. *Applied Psychology.* 2008;57(4):561-588.
138. Vansteenkiste M, Sierens E, Soenens B, Luyckx K, Lens W. Motivational Profiles From a Self-Determination Perspective: The Quality of Motivation Matters. *Journal of Educational Psychology.* 2009;101(3):671-688.
139. Ryan RM, Lynch MF, Vansteenkiste M, Deci EL. Motivation and autonomy in counseling, psychotherapy, and behavior change: a look at theory and practice. *The Counseling Psychologist.* 2010;39(2):193-260.
140. Vansteenkiste M, Soenens B, Vandereycken W. Motivation to Change in Eating Disorder Patients: A Conceptual Clarification on the Basis of Self-Determination Theory. *International Journal of Eating Disorders.* 2005;37(3):207-219.
141. Abblett MR. Motivation for change in psychotherapy: The relationship between the transtheoretical model and self-determination theory and prediction of clinical services utilization. *Dissertation Abstracts International.* 2002;63(4-B):2047.
142. Fortier MS, Sweet SN, Tulloch H, et al. Self-determination and exercise stages of change: results from the Diabetes Aerobic and Resistance Exercise trial. *J Health Psychol.* 2012;17(1):87-99.
143. Mullan E, Markland D. Variations in self-determination across the stages of change for exercise in adults. *Motivation and Emotion.* 1997;21(4):349-362.
144. Lippke S, Ziegelmann JP. Theory-Based Health Behavior Change: Developing, Testing, and Applying Theories for Evidence-Based Interventions. *Applied Psychology.* 2008;57(4):698-716.
145. Lambert MJ, Whipple JL, Smart DW, Vermeersch DA, Nielsen SL. The Effects of Providing Therapists With Feedback on Patient Progress During Psychotherapy: Are Outcomes Enhanced? *Psychotherapy Research.* 2001;11(1):49 - 68.
146. Lambert MJ, Whipple JL, Vermeersch DA, et al. Enhancing psychotherapy outcomes via providing feedback on client progress: A replication. *Clinical Psychology and Psychotherapy.* 2002;9:91-103.
147. Lambert MJ, Whipple JL, Hawkins EJ. Is it time for clinicians to routinely track patient outcome? A meta-analysis. *Clinical Psychology: Science and Practice.* 2003;10(3):288-301.
148. Whipple JL, Lambert MJ, Vermeersch DA, Smart DW, Nielsen SL, Hawkins EJ. Improving the effects of psychotherapy: The use of early identification of treatment failure and problem-solving strategies in routine practice. *Journal of Counseling Psychology.* 2003;50(1):59-68.
149. Lambert MJ, Harmon C, Slade K, Whipple JL, Hawkins EJ. Providing feedback to psychotherapists on their patients' progress: clinical results and practice suggestions. *Journal of Clinical Psychology.* 2005;61(2):165-174.
150. Hawkins EJ, Lambert MJ, Vermeersch DA, Slade KL, Tuttle KC. The therapeutic effects of providing patient progress information to therapists and patients. *Psychotherapy Research.* 2004;14(3):308 - 327.
151. Sapyta J, Riemer M, Bickman L. Feedback to clinicians: Theory, research, and practice. *Journal of Clinical Psychology.* 2005;61(2):145-153.

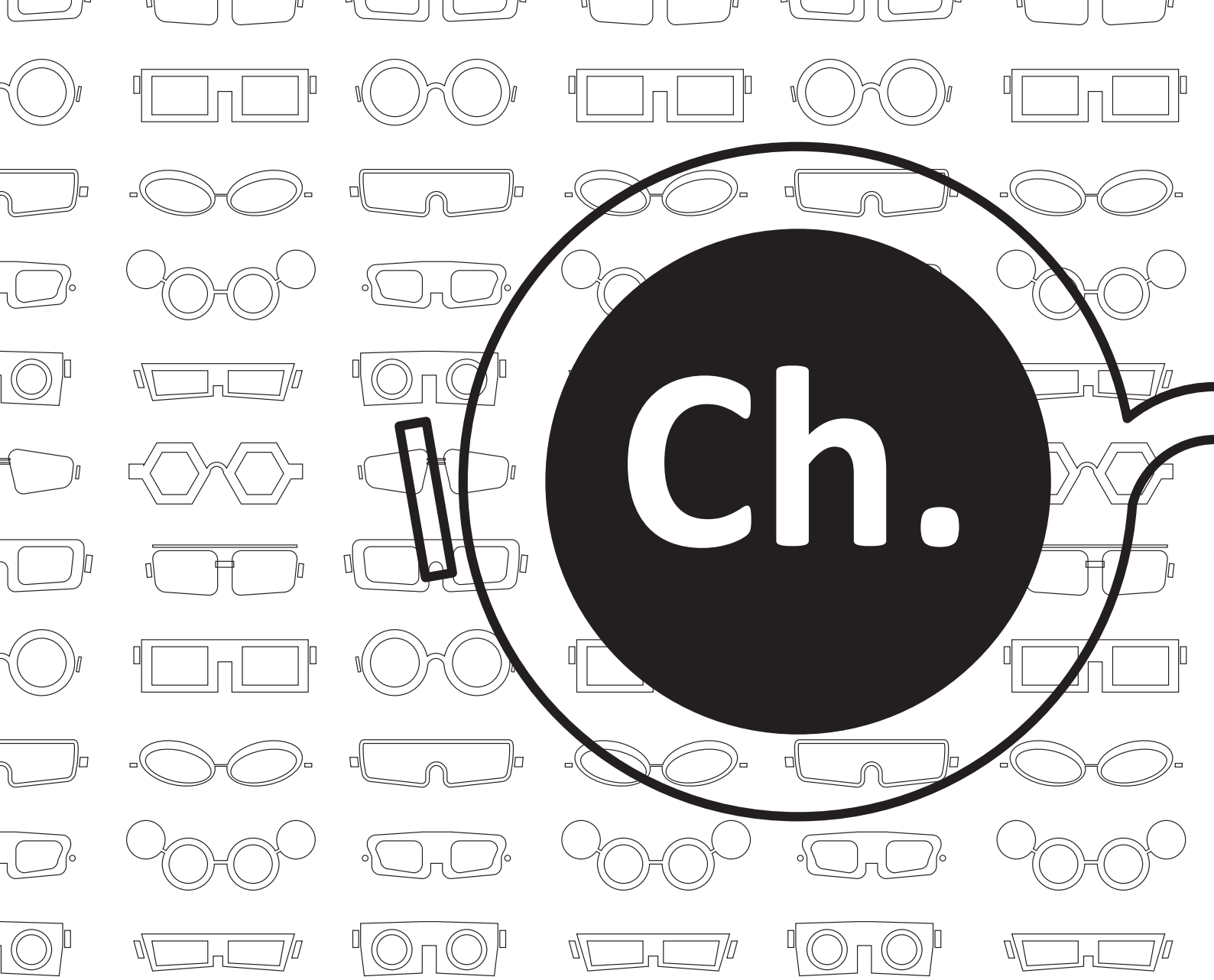
152. Priebe S, McCabe R, Bullenkamp J, et al. Structured patient-clinician communication and 1-year outcome in community mental healthcare: cluster randomised controlled trial. *Br J Psychiatry.* 2007;191:420-426.
153. Marshall M, Lockwood A, Green G, Zajac-Roles G, Roberts C, Harrison G. Systematic assessments of need and care planning in severe mental illness: Cluster randomised controlled trial. *Br J Psychiatry.* 2004;185:163-168.
154. Drukker M, van Os J, Bak M, a Campo J, Delespaul P. Systematic monitoring of needs for care and global outcomes in patients with severe mental illness. *BMC Psychiatry.* 2010;10(36).
155. Monti PM, Barnett NP, Colby SM, et al. Motivational interviewing versus feedback only in emergency care for young adult problem drinking. *Addiction.* 2007;102(8):1234-1243.
156. Vader AM, Walters ST, Prabhu GC, Houck JM, Field CA. The Language of Motivational Interviewing and Feedback: Counselor Language, Client Language, and Client Drinking Outcomes. *Psychology of Addictive Behaviors.* 2010;24(2):190-197.
157. Walters ST, Vader AM, Harris RT, Field CA, Jouriles EN. Dismantling Motivational Interviewing and Feedback for College Drinkers: A Randomized Clinical Trial. *J Consult Clin Psychol.* 2009;77(1):64-73.
158. Bachrach LL. Defining chronic mental illness: A concept paper. *Hospital & Community Psychiatry.* 1988;39(4):383-388.
159. Kortrijk HE, Staring AB, van Baars AW, Mulder CL. Involuntary admission may support treatment outcome and motivation in patients receiving assertive community treatment. *Social Psychiatry and Psychiatric Epidemiology.* 2010;45(2):245-252. Epub 2009 May 2002.
160. Drieschner KH. *Measuring treatment motivation and treatment engagement in forensic psychiatric outpatient treatment: Development of two instruments.* Enschede: Febodruk; 2005.
161. Tait L, Birchwood M, Trower P. A new scale (SES) to measure engagement with community mental health services. *Journal of Mental Health.* 2002;11:191-198.
162. Chalmers AF. *What is this thing called science? An assessment of the nature and status of science and its methods.* Queensland, Australia: University of Queensland Press; 1999.
163. Mulder CL, Staring ABP, Loos J, et al. De Health of the Nation Outcome Scales (honos) als instrument voor 'routine outcome assessment'. *Tijdschr Psychiatr.* 2004;46:273-284.
164. Wing JK, Beevor AS, Curtis RH, Park SB, Hadden S, Burns A. Health of the Nation Outcome Scales (HoNOS). Research and development. *Br J Psychiatry.* 1998;172:11-18.
165. Overall JE, Gorham DR. The Brief Psychiatric Rating Scale. *Psychological Reports.* 1962;10:799-812.
166. Andersen J, Larsen J, Schultz V, Nielsen BM, et al. The Brief Psychiatric Rating Scale: Dimension of schizophrenia: Reliability and construct validity. *Psychopathology.* 1989;22(2-3):168-176.
167. Priebe S, Huxley P, Knight S, Evans S. Application and results of the Manchester Short Assessment of Quality of Life (MANSA). *International Journal of Social Psychiatry.* 1999;45(1):7-12.
168. Bjorkman T, Svensson B. Quality of life in people with severe mental illness. Reliability and validity of the Manchester Short Assessment of Quality of Life (MANSA). *Nordic Journal of Psychiatry.* 2005;59(4):302-306.
169. Williams GC, Cox EM, Kouides R, Deci EL. Presenting the Facts About Smoking to Adolescents: Effects of an Autonomy-Supportive Style. *Archives of Pediatrics & Adolescent Medicine.* 1999;153(9):959-964.
170. Jonge JMd, Schaap CPDR, Schippers GM. Motivatie voor verandering: een Nederlandse versie van de University of Rhode Island Change Assessment (URICA-NL). *Diagnostiek-wijzer.* 2002;5(3):114-122.
171. Hoeppner BB, Velicer WF, Redding CA, et al. Psychometric evaluation of the smoking cessation Processes of Change scale in an adolescent sample. *Addict Behav.* 2006;31(8):1363-1372.
172. Rossi SR, Rossi JS, Rossi-DelPrete LM, Prochaska JO, Banspach SW, Carleton RA. A processes of change model for weight control for participants in community-based weight loss programs. *International Journal of the Addictions.* 1994;29(2):161-177.
173. McFarland J, McDonald C, Hallahan B. Insight in mental illness: An educational review. *Irish Journal of Psychological Medicine.* 2009;26(1):32-36.
174. Birchwood M, Smith J, Drury V, Healy J, Macmillan F, Slade M. A self-report Insight Scale for psychosis: reliability, validity and sensitivity to change. *Acta Psychiatr Scand.* 1994;89(1):62-67.
175. Stefanopoulou E, Manoharan A, Landau S, Geddes JR, Goodwin G, Frangou S. Cognitive functioning in patients with affective disorders and schizophrenia: A meta-analysis. *International Review of Psychiatry.* 2009;21(4):336-356.
176. Quee PJ, van der Meer L, Bruggeman R, et al. Insight in psychosis: relationship with neurocognition, social cognition and clinical symptoms depends on phase of illness. *Schizophrenia Bulletin.* 2011;37(1):29-37.
177. Aleman A, Agrawal N, Morgan KD, David AS. Insight in psychosis and neuropsychological function: meta-analysis. *Br J Psychiatry.* 2006;189:204-212.
178. Grant DA, Berg EA. A behavioral analysis of degree of reinforcement and ease of shifting to new responses in a Weigl-type card-sorting problem. *Journal of Experimental Psychology.* 1948;38(4):404-411.
179. Wilson BA, Evans JJ, Alderman N, Burgess PW, Emslie H. Behavioural assessment of the dysexecutive syndrome. In: Rabbitt P, ed. *Methodology of frontal and executive function*. Hove: Psychology Press; 1997:239-250.
180. Wilson BA, Evans JJ, Emslie H, Alderman N, Burgess PW. The development of an ecologically valid test for assessing patients with a dysexecutive syndrome. *Neuropsychol Rehabil.* 1998;8:213-228.

181. Jelicic M, Henquest CEC, Derix MMA, Jolles J. Test-retest stability of the Behavioural Assessment of Dysexecutive Syndrome in a sample of psychiatric patients. *Int J Neurosci.* 2001;110:73-78.
182. De Weert-Van Oene GH, De Jong CA, Jorg F, Schrijvers GJ. The Helping Alliance Questionnaire: Psychometric properties in patients with substance dependence. *Subst Use Misuse.* 1999;34(11):1549-1569.
183. Priebe Sa, Richardson Ma, Cooney Mb, Adedeji Oc, McCabe Ra. Does the Therapeutic Relationship Predict Outcomes of Psychiatric Treatment in Patients with Psychosis? A Systematic Review. *Psychother Psychosom.* 2011;80(2): 70-77.
184. Calsyn RJ, Klinkenberg WD, Morse GA, Lemming MR. Predictors of the working alliance in assertive community treatment. *Community Ment Health J.* 2006;42(2):161-175.
185. Link BG, Struening EL, Neese-Todd S, Asmussen S, Phelan JC. On Describing and Seeking to Change the Experience of Stigma. *Psychiatr Rehab Skills.* 2002;6(2):201-231.
186. Staring AB, Van der Gaag M, Van den Berge M, Duivenvoorden HJ, Mulder CL. Stigma moderates the associations of insight with depressed mood, low self-esteem, and low quality of life in patients with schizophrenia spectrum disorders. *Schizophr Res.* 2009;115(2-3):363-369.
187. Link B, Castille DM, Stuber J, Link B, Castille DM, Stuber J. Stigma and coercion in the context of outpatient treatment for people with mental illnesses. *Soc Sci Med.* 2008;67(3):409-419.
188. Howard MO, Kivlahan D, Walker RD. Cloninger's tridimensional theory of personality and psychopathology: applications to substance use disorders. *Journal of Studies on Alcohol.* 1997;58:48-66.
189. Cloninger CR, Svrakic DM, Przybeck TR. A psychobiological model of temperament and character. *Archives of General Psychiatry.* 1993;50(12):975-990.
190. Staring AB, Van der Gaag M, Koopmans GT, et al. Treatment adherence therapy in people with psychotic disorders: randomised controlled trial. *Br J Psychiatry.* 2010;197(6): 448-455.
191. Vansteenkiste M, Williams GC, Resnicow K. Toward systematic integration between self-determination theory and motivational interviewing as examples of top-down and bottom-up intervention development: autonomy or volition as a fundamental theoretical principle. *International Journal of Behavioral Nutrition & Physical Activity.* 2012;9:23.
192. Deci EL, Ryan RM. Facilitating Optimal Motivation and Psychological Well-Being Across Life's Domains. *Can Psychol.* 2008;49(1):14-23.
193. McBride C, Zuroff DC, Ravitz P, et al. Autonomous and controlled motivation and interpersonal therapy for depression: moderating role of recurrent depression. *British Journal of Clinical Psychology.* 2010;49(Pt 4):529-545.
194. Green MF, Kern RS, Braff DL, Mintz J. Neurocognitive deficits and functional outcome in schizophrenia: are we measuring the "right stuff"? *Schizophr Bull.* 2000;26(1):119-136.
195. Alexander LB, Luborsky L. The Penn Helping Alliance Scales. In: Greenberg LS, Pinsof WM, eds. *The psychotherapeutic process: A research handbook*. New York, NY: Guilford Press; US; 1986:325-366.
196. Silverstein SM. Bridging the Gap Between Extrinsic and Intrinsic Motivation in the Cognitive Remediation of Schizophrenia. *Schizophrenia Bulletin.* 2010;36(5):949-956.
197. Jochems EC, Mulder CL, van Dam A, et al. Motivation and treatment engagement intervention trial (MotivaTe-IT): the effects of motivation feedback to clinicians on treatment engagement in patients with severe mental illness. *BMC Psychiatry.* 2012;12:209.
198. Urbanoski KA, Wild TC. Assessing self-determined motivation for addiction treatment: validity of the Treatment Entry Questionnaire. *J Subst Abuse Treat.* 2012;43(1):70-79.
199. Tait L, Birchwood M, Trower P. A new scale (SES) to measure engagement with community mental health services. *J Ment Health.* 2002;11(2):191-198.
200. Babyak MA, Green SB, Babyak MA, Green SB. Confirmatory factor analysis: an introduction for psychosomatic medicine researchers. *Psychosomatic Medicine.* 2010;72(6):587-597.
201. Hu L-t, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling.* 1999; 6:1-55.
202. Muthén LK, Muthén BO. *Mplus User's Guide. Seventh Edition.* . Los Angeles, CA: Muthén & Muthén; 1998-2012.
203. Reuterberg S-E, Gustafsson J-E. Confirmatory factor analysis and reliability: Testing measurement model assumptions. *Educational and Psychological Measurement.* 1992;52(4):795-811.
204. Nunnally JC, Bernstein IH. *Psychometric theory.* Vol 3. New York: McGraw-Hill; 1994.
205. Cohen J. *Statistical power analysis for the behavioral sciences.* Vol 2. Hillasdal, NJ: Erlbaum; 1988.
206. Hemphill JF. Interpreting the Magnitudes of Correlation Coefficients. *American Psychologist.* 2003;58(1):78-79.
207. Jochems EC, Van Dam A, Duivenvoorden HJ, Scheffer S, Van der Feltz-Cornelis CM, Mulder CL. Different Perspectives of Clinicians and Patients with Severe Mental Illness on Motivation for Treatment. *Clinical Psychology and Psychotherapy.* 2015.
208. Elliot AJ. The Hierarchical Model of Approach-Avoidance Motivation. *Motivation & Emotion.* 2006;30(2):111-116.
209. Smith GT. On Construct Validity: Issues of Method and Measurement. *Psychol Assessment.* 2005;17(4):396-408.
210. Vancampfort D, De Hert M, Vansteenkiste M, et al. The importance of self-determined motivation towards physical activity in patients with schizophrenia. *Psychiatry Res.* 2013;210(3):812-818.
211. Jochems EC, Van der Feltz-Cornelis CM, Van Dam A, Duivenvoorden HJ, Mulder CL. The effects of motivation feedback in patients with severe mental illness: a cluster randomized controlled trial. *Neuropsychiatric Disease and Treatment.* 2015;11:3049-3064.

212. Silva MN, Marques MM, Teixeira PJ. Testing theory in practice: The example of self-determination theory-based interventions. *The European Health Psychologist.* 2014;16:171-180.
213. Dickerson FB, Tenhula WN, Green-Paden LD. The token economy for schizophrenia: review of the literature and recommendations for future research. *Schizophr Res.* 2005;75(2-3):405-416.
214. Medalia A, Saperstein A. The role of motivation for treatment success. *Schizophrenia Bulletin.* 2011;37 Suppl 2:S122-128.
215. van der Kaap-Deeder J, Vansteenkiste M, Soenens B, Verstuyf J, Boone L, Smets J. Fostering self-endorsed motivation to change in patients with an eating disorder: The role of perceived autonomy support and psychological need satisfaction. *Int J Eat Disord.* 2014.
216. Williams GC, McGregor HA, Sharp D, et al. Testing a selfdetermination theory intervention for motivating tobacco cessation: Supporting autonomy and competence in a clinical trial. *Health Psychology.* 2006;25(91-101).
217. Ng JYY, Ntoumanis N, Thøgersen-Ntoumani C, Deci EL, Ryan RM, Duda JL. Self-Determination Theory Applied to Health Contexts: A Meta-Analysis. *Perspectives on Psychological Science.* 2012;7:325.
218. Jochems EC, Mulder CL, Duivenvoorden HJ, van der Feltz-Cornelis CM, van Dam A. Measures of Motivation for Psychiatric Treatment Based on Self-Determination Theory: Psychometric Properties in Dutch Psychiatric Outpatients. *Assessment.* 2014;21(4):494-510.
219. Jöreskog KG. Statistical analysis of sets of congeneric tests. . *Psychometrika.* 1971;36:109-133.
220. Bentler PM. Comparative fit indexes in structural models. *Psychol Bull.* 1990;107:238-246.
221. Tucker LR, Lewis C. A reliability coefficient for maximum likelihood factor analysis. *Psychometrika.* 1973;38:1-10.
222. Browne MW, Cudeck R. Alternative ways of assessing model fit. . In: Bollen KA, Long JS, eds. *Testing Structural Equation Models.* . Beverly Hills, California: Sage Publications; 1992:136-162.
223. UCLA_Statistics. A scaled difference chi-square test statistic for moment structure analysis. 1999; http://statistics.ucla.edu/preprints/uclastat-preprint-1999:19. Accessed 05-02-2016, 2016.
224. Kraus SJ. Attitudes and the prediction of behavior: A meta-analysis of the empirical literature. *Personality and Social psychology Bulletin.* 1995;21:58-75.
225. Deci EL, Ryan RM. Self-determination theory in health care and its relations to motivational interviewing: a few comments. *International Journal of Behavioral Nutrition & Physical Activity.* 2012;9(24).
226. Vandenbroucke JP, von Elm E, Altman DG, et al. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): explanation and elaboration. *Plos Medicine.* 2007;4(10):e297.
227. Angst J, Gamma A, Clarke D, Ajdacic-Gross V, Rossler W, Regier D. Subjective distress predicts treatment seeking for depression, bipolar, anxiety, panic, neurasthenia and insomnia severity spectra. *Acta Psychiatr Scand.* 2010;122(6):488-498.
228. van Beek N, Verheul R. Motivation for treatment in patients with personality disorders. *Journal of Personality Disorders.* 2008;22(1):89-100.
229. Velasquez MM, Crouch C, von Sternberg K, Grosdanis I. Motivation for change and psychological distress in homeless substance abusers. *J Subst Abuse Treat.* 2000;19(4):395-401.
230. Mulder CL, Jochems E, Kortrijk HE. The motivation paradox: higher psychosocial problem levels in severely mentally ill patients are associated with less motivation for treatment. *Social Psychiatry and Psychiatric Epidemiology.* 2014;49(4):541-548.
231. Drake RE, O'Neal EL, Wallach MA. A systematic review of psychosocial research on psychosocial interventions for people with co-occurring severe mental and substance use disorders. *J Subst Abuse Treat.* 2008;34(1):123-138.
232. Belding MA, Iguchi MY, Lamb RJ. Stages of Change in Methadone Maintenance: Assessing the Convergent Validity of Two Measures. *Psychology of Addictive Behaviors.* 1996;10(3):157-166.
233. Slade M, Beck A, Bindman J, Thornicroft G, Wright S. Routine clinical outcome measures for patients with severe mental illness: CANSAS and HoNOS. *Br J Psychiatry.* 1999;174(5):404-408.
234. Sanderse C, Verweij A. Etniciteit: definitie en gegevens [Ethnicity: definition and data]. 2012; http://www.nationaalkompas.nl/bevolking/etniciteit/wat-is-etniciteit/, 2014.
235. de Vet E, de Nooijer J, de Vries NK, Brug J. Testing the transtheoretical model for fruit intake: comparing web-based tailored stage-matched and stage-mismatched feedback. *Health Educ Res.* 2008;23(2):218-227.
236. Quinlan KB, McCaul KD. Matched and mismatched interventions with young adult smokers: testing a stage theory. *Health Psychol.* 2000;19(2):165-171.
237. Aveyard P, Massey L, Parsons A, Manaseki S, Griffin C. The effect of Transtheoretical Model based interventions on smoking cessation. *Soc Sci Med.* 2009;68(3):397-403.
238. Rosen CS. Is the sequencing of change processes by stage consistent across health problems? A meta-analysis. *Health Psychol.* 2000;19(6):593-604.
239. Torrey EF, Zdanowicz M. Outpatient commitment: what, why, and for whom. *Psychiatr Serv.* 2001;52(3):337-341.
240. Nose M, Barbui C, Tansella M. How often do patients with psychosis fail to adhere to treatment programmes? A systematic review. *Psychol Med.* 2003;33(7):1149-1160.
241. Killaspy H, Banerjee S, King M, Lloyd M. Prospective controlled study of psychiatric out-patient non-attendance. Characteristics and outcome. *Br J Psychiatry.* 2000;176:160-165.

242. Shimokawa K, Lambert MJ, Smart DW. Enhancing treatment outcome of patients at risk of treatment failure: meta-analytic and mega-analytic review of a psychotherapy quality assurance system. *J Consult Clin Psychol.* 2010;78(3):298-311.
243. Boyer L, Lancon C, Baumstarck K, Parola N, Berbis J, Auquier P. Evaluating the impact of a quality of life assessment with feedback to clinicians in patients with schizophrenia: randomised controlled trial. *Br J Psychiatry.* 2013;202:447-453.
244. Bickman L, Kelley SD, Breda C, de Andrade AR, Riemer M. Effects of routine feedback to clinicians on mental health outcomes of youths: results of a randomized trial. *Psychiatr Serv.* 2011;62(12):1423-1429.
245. Harmon S, Lambert MJ, Smart DM, et al. Enhancing outcome for potential treatment failures: Therapist-client feedback and clinical support tools. *Psychotherapy Research.* 2007;17(4):379-392.
246. Van der Feltz-Cornelis CM, Adèr HJ. Randomization in psychiatric intervention research in the general practice setting. *International Journal of Methods in Psychiatric Research.* 2000;9(3):134-142.
247. Campbell MK, Piaggio G, Elbourne DR, Altman DG, Group C. Consort 2010 statement: extension to cluster randomised trials. *BMJ.* 2012;345:e5661.
248. Staring ABPP, van der Gaag MP, Duivenvoorden HJP, Weiden PJMD, Mulder CLMDP. Why Do Patients with Schizophrenia Who Have Poor Insight Still Take Antipsychotics? Memory Deficits as Moderators Between Adherence Belief and Behavior. *Journal of Psychiatric Practice.* 2011;17(5):320-329.
249. Johansen RM, Hestad KP, Iversen VCP, et al. Cognitive and Clinical Factors Are Associated With Service Engagement in Early-Phase Schizophrenia Spectrum Disorders. *Journal of Nervous & Mental Disease.* 2011;199(3):176-182.
250. Morisky DE, Ang A, Krousel-Wood M, Ward HJ. Predictive validity of a medication adherence measure in an outpatient setting. *Journal of Clinical Hypertension.* 2008;10(5):348-354.
251. Strauss D. On Miettinen's multivariate confounder score. *J Clin Epidemiol.* 1998;51(3):233-236.
252. Catty J, Cowan N, Poole Z, et al. Continuity of care for people with non-psychotic disorders. *Int J Soc Psychiatry.* 2013;59(1):18-27.
253. Ryan RM, Lynch MF, Vansteenkiste M, Deci EL. Motivation and autonomy in counseling, psychotherapy, and behavior change: A look at theory and practice. *The Counseling Psychologist.* 2011;39(2):193-260.
254. Gard DE, Fisher M, Garrett C, Genevsky A, Vinogradov S. Motivation and its relationship to neurocognition, social cognition, and functional outcome in schizophrenia. *Schizophr Res.* 2009;115(1):74-81.
255. Koren D, Seidman LJ, Goldsmith M, Harvey PD. Real-world cognitive--and metacognitive--dysfunction in schizophrenia: a new approach for measuring (and remediating) more "right stuff". *Schizophr Bull.* 2006;32(2):310-326.
256. Lysaker PH, Leonhardt BL, Pijnenborg M, van Donkersgoed R, de Jong S, Dimaggio G. Metacognition in schizophrenia spectrum disorders: methods of assessment and associations with neurocognition, symptoms, cognitive style and function. *Isr J Psychiatry Relat Sci.* 2014;51(1):54-61.
257. Raes V, De Jong CA, De Bacquer D, Broekaert E, De Maeseneer J. The effect of using assessment instruments on substance-abuse outpatients' adherence to treatment: a multi-centre randomised controlled trial. *BMC Health Services Research.* 2011;11(123).
258. Defuentes-Merillas L, Dejong CA, Schippers GM. Reliability and validity of the Dutch version of the Readiness to Change Questionnaire. *Alcohol & Alcoholism.* 2002;37(1):93-99.
259. Harmon C, Hawkins EJ, Lambert MJ, Slade K, Whipple JS. Improving outcomes for poorly responding clients: The use of clinical support tools and feedback to clients. *Journal of Clinical Psychology.* 2005;61(2):175-185.
260. Lynch MF, Plant RW, Ryan RM. Psychological Needs and Threat to Safety: Implications for Staff and Patients in a Psychiatric Hospital for Youth. *Professional Psychology - Research & Practice.* 2005;36(4):415-425.
261. Choi KH, Saperstein AM, Medalia A. The relationship of trait to state motivation: The role of self-competency beliefs. *Schizophr Res.* 2012;139(1-3):73-77.
262. Doyle M, Flanagan S, Browne S, et al. Subjective and external assessments of quality of life in schizophrenia: relationship to insight. *Acta Psychiatr Scand.* 1999;99(6):466-472.
263. Selten JP, Wiersma D, van den Bosch RJ. Clinical predictors of discrepancy between self-ratings and examiner ratings for negative symptoms. *Compr Psychiatry.* 2000;41(3):191-196.
264. Bell M, Fiszdon J, Richardson R, Lysaker P, Bryson G. Are self-reports valid for schizophrenia patients with poor insight? Relationship of unawareness of illness to psychological self-report instruments. *Psychiatry Res.* 2007;151(1-2):37-46.
265. Paunonen SV, LeBel EP. Socially Desirable Responding and Its Elusive Effects on the Validity of Personality Assessments. *Journal of Personality & Social Psychology.* 2012;103(1):158-175.
266. Holden RR. Socially Desirable Responding Does Moderate Personality Scale Validity Both in Experimental and in Nonexperimental Contexts. *Can J Behav Sci.* 2007;39(3):184-201.
267. Lincoln TM, Ziegler M, Lullmann E, Muller MJ, Rief W. Can delusions be self-assessed? Concordance between self- and observer-rated delusions in schizophrenia. *Psychiatry Research.* 2010;178(2):249-254.
268. Geller J. Estimating readiness for change in anorexia nervosa: comparing clients, clinicians, and research assessors. *Int J Eat Disord.* 2002;31(3):251-260.
269. Choi J, Choi KH, Felice Reddy L, Fiszdon JM. Measuring motivation in schizophrenia: is a general state of motivation necessary for task-specific motivation? *Schizophr Res.* 2014;153(1-3):209-213.
270. Wigfield A, Eccles JS. Expectancy-Value Theory of Achievement Motivation. *Contemp Educ Psychol.* 2000;25(1):68-81.

271. Finnell D. Use of the Transtheoretical Model for Individuals with Co-Occurring Disorders. *Community Ment Health J.* 2003;39(1):3-15.
272. Klag S. *Self-Determination Theory and the Theory of Planned Behaviour applied to substance abuse treatment in a therapeutic community setting.* Gold Coast, QLD: Griffith University; 2006.
273. Penney S, Skilling T. Moderators of Informant Agreement in the Assessment of Adolescent Psychopathology: Extension to a Forensic Sample. *Psychol Assessment.* 2012;24(2):386-401.
274. Watson D, Hubbard B, Wiese D. Self-other agreement in personality and affectivity: the role of acquaintanceship, trait visibility, and assumed similarity. . *Journal of Personality & Social Psychology.* 2000;78(3):546-558.
275. Velasquez MM, Carbonari JP, DiClemente CC. Psychiatric severity and behavior change in alcoholism: the relation of the transtheoretical model variables to psychiatric distress in dually diagnosed patients. *Addict Behav.* 1999;24(4):481-496.
276. Network AMHOaC. The Health of the Nation Outcomes Scales (HoNOS), General Adult Version: Towards an agenda for future development 2006, 1.
277. Oosterman JM, Wijers M, Kessels RP. Planning or something else? Examining neuropsychological predictors of Zoo Map performance. *Appl Neuropsychol Adult.* 2013;20(2):103-109.
278. Tait L, Birchwood M, Trower P. Predicting engagement with services for psychosis: insight, symptoms and recovery style. *Br J Psychiatry.* 2003;182:123-128.
279. Dorz S, Borgherini G, Conforti D, Scarso C, Magni G. Comparison of self-rated and clinician-rated measures of depressive symptoms: a naturalistic study. *Psychology and Psychotherapy: Theory, research and practice.* 2004;77(3):353-361.
280. *SAS 9.3* [computer program]. Cary, NC, USA.2002-2010.
281. Cooper WH. Ubiquitous halo. *Psychol Bull.* 1981;90:218-244.
282. Alegria M, Roter DL, Valentine A, et al. Patient-clinician ethnic concordance and communication in mental health intake visits. *Patient Educ Couns.* 2013;93(2):188-196.
283. Cooper LA, Beach MC, Johnson RL, Inui TS. Delving below the surface. Understanding how race and ethnicity influence relationships in health care. *J Gen Intern Med.* 2006;21 Suppl 1:S21-27.
284. Priebe S, Fakhoury W, White I, et al. Characteristics of teams, staff and patients: associations with outcomes of patients in assertive outreach. *Br J Psychiatry.* 2004;185:306-311.
285. Michie S, West R, Spring B. Moving from theory to practice and back in social and health psychology. *Health Psychology.* 2013;32(5):581-585.
286. Noar SM. A health educator's guide to theories of health behavior. *International Quarterly of Community Health Education.* 2005;24(1):75-92.
287. Project_MATCH_Research_Group. Matching alcoholism treatments to client heterogeneity: treatment main effects and matching effects on drinking during treatment. Project MATCH Research Group. *J Stud Alcohol.* 1998;59(6):631-639.
288. Garcia K, Mann T. From 'I Wish' to 'I Will': social-cognitive predictors of behavioral intentions. *Journal of Health Psychology.* 2003;8(3):347-360.
289. Hilburger JJ. *Stages of change in readiness for rehabilitation services among people with severe and persistent mental illness*, Hilburger, John Joseph: Illinois Inst of Technology, US; 1995.
290. Carey KB, Purnine DM, Maisto SA, Carey MP, Barnes KL. Decisional balance regarding substance use among persons with schizophrenia. *Community Ment Health J.* 1999;35(4):289-299.
291. Rogers RW. Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In: Cacioppo JT, Petty RE, eds. *Social psychophysiology*. New York: Guilford; 1983:153-176.
292. Keatley D, Clarke DD, Hagger MS. Investigating the predictive validity of implicit and explicit measures of motivation in problem-solving behavioural tasks. *Br J Soc Psychol.* 2013;52(3):510-524.
293. Kobeleva X, Seidel EM, Kohler C, Schneider F, Habel U, Derntl B. Dissociation of explicit and implicit measures of the behavioral inhibition and activation system in borderline personality disorder. *Psychiatry Res.* 2014;218(1-2):134-142.
294. Gollwitzer PM. Goal achievement: The role of intentions. In: Stroebe W, Hewstone M, eds. *European Review of Social Psychology.* Vol 4. Chichester, UK: Wiley; 1993:141-185.
295. Loudon K, Treweek S, Sullivan F, Donnan P, Thorpe KE, Zwarenstein M. The PRECIS-2 tool: designing trials that are fit for purpose. *Bmj.* 2015;350:h2147.
296. Delgado-Rodriguez M, Llorca J. Bias. *J Epidemiol Community Health.* 2004;58(8):635-641.
297. Beauducel A, Wittmann WW. Simulation study on fit indices in confirmatory factor analysis based on data with slightly distorted simple structure. *Structural Equation Modeling.* 2005;12:41-75.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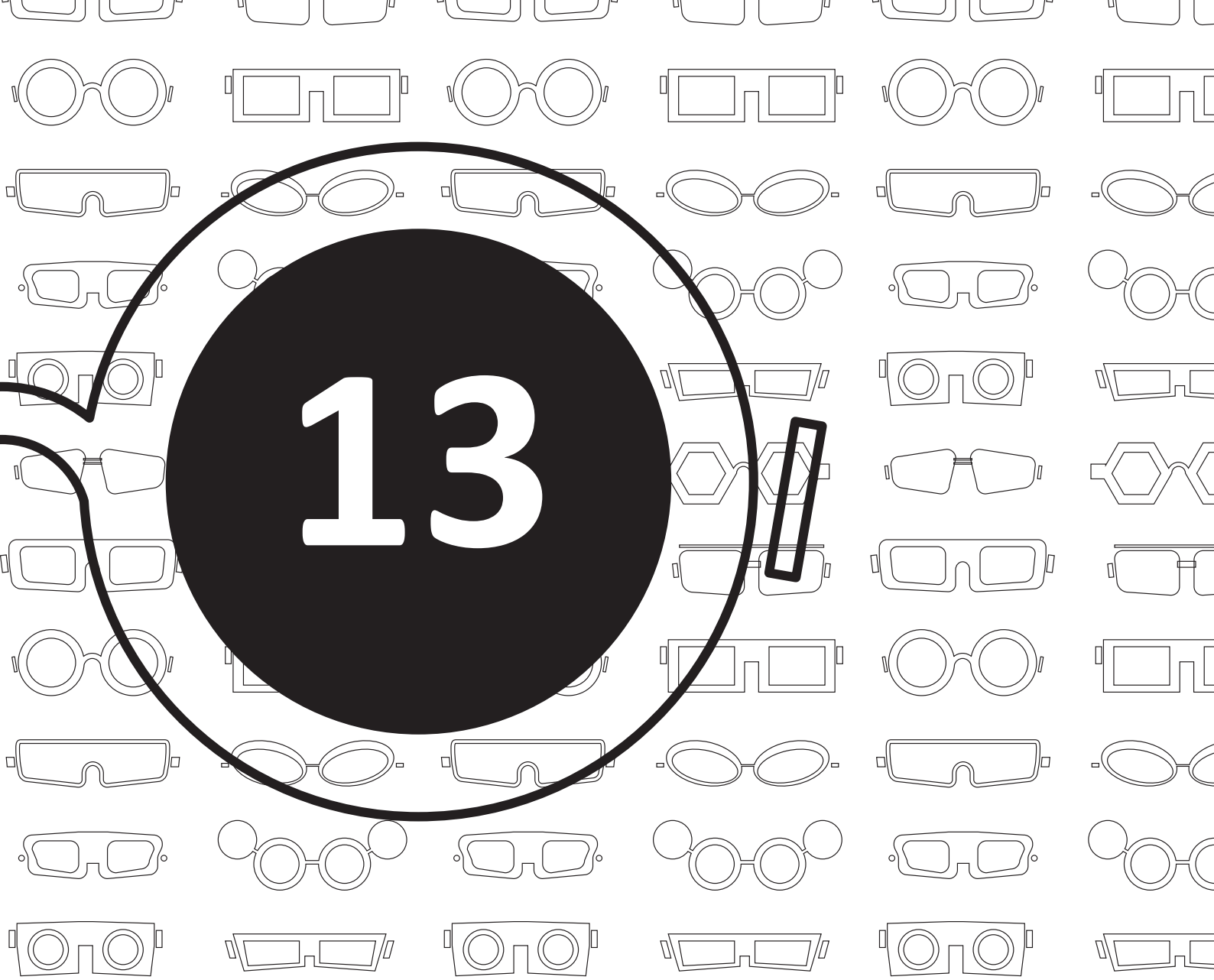


Appendices

Dutch Treatment Entry Questionnaire (TEQ)
Dutch Health Care Climate Questionnaire (HCCQ)
Dutch Short Motivation Feedback List (SMFL)
Supplementary material for Chapter 6, including the perceived external pressure scale
Supplementary material for Chapter 7, including the Dutch Short Processes of Change Scale (SPoC-Dutch)

Dutch Treatment Entry Questionnaire (TEQ)

Geeft u alstublieft aan in hoeverre u het eens of oneens bent met de stelling, door een getal te omcirkelen dat het beste past bij uw mening. Het gaat over uw mening op dit moment. Er zijn geen “goede” of “slechte” antwoorden, en uw antwoorden worden vertrouwelijk behandeld.

Omcirkel een cijfer van **1 (helemaal niet mee eens) tot 7 (helemaal mee eens)** achter elke stelling.

		Helemaal **niet** mee eens						Helemaal mee eens
1.	Als ik in behandeling blijf, is dat waarschijnlijk omdat ik het gevoel heb dat dit de beste manier is om mezelf te helpen.	1	2	3	4	5	6	7
2.	Ik ben van plan om de behandeling te doorlopen omdat ik mezelf zal haten als ik mijn klachten niet onder controle krijg.	1	2	3	4	5	6	7
3.	Ik besloot om in behandeling te gaan omdat ik mezelf niet zal mogen als ik mijn klachten niet onder controle krijg.	1	2	3	4	5	6	7
4.	Ik had geen keuze over het wel of niet in behandeling gaan.	1	2	3	4	5	6	7
5.	Ik ben van plan om de behandeling te doorlopen, omdat het hebben van klachten het moeilijk voor me maakt om dingen te doen zoals ik wil.	1	2	3	4	5	6	7
6.	Mijn familie heeft ervoor gezorgd dat ik in behandeling ging.	1	2	3	4	5	6	7
7.	Ik besloot om in behandeling te gaan omdat ik echt enkele dingen wil veranderen in mijn leven.	1	2	3	4	5	6	7
8.	Ik heb ermee ingestemd om een behandeling te volgen, omdat ik wil dat anderen zien dat ik echt probeer mijn klachten aan te pakken.	1	2	3	4	5	6	7
9.	Ik ben van plan om de behandeling te doorlopen omdat ik me zal schamen als ik het niet doe.	1	2	3	4	5	6	7
10.	De reden dat ik in behandeling ben, is omdat andere mensen mij onder druk hebben gezet om hier te komen.	1	2	3	4	5	6	7
11.	Als ik in behandeling blijf is dat waarschijnlijk omdat ik me anders een mislukkeling voel.	1	2	3	4	5	6	7
12.	Ik ben van plan om de behandeling te doorlopen omdat ik zelf heb kunnen kiezen.	1	2	3	4	5	6	7
13.	Ik ben van plan om de behandeling te doorlopen, omdat vrij zijn van klachten een keuze is die ik echt wil maken.	1	2	3	4	5	6	7
14.	Mijn vrienden hebben mij sterk onder druk gezet om in behandeling te gaan.	1	2	3	4	5	6	7
15.	Als ik in behandeling blijf, is dat waarschijnlijk omdat ik een erg slecht gevoel over mezelf zal krijgen als ik het niet doe.	1	2	3	4	5	6	7
16.	Ik besloot om in behandeling te gaan omdat het voor mij persoonlijk belangrijk voelt om mijn klachten aan te pakken.	1	2	3	4	5	6	7
17.	Ik heb ermee ingestemd om een behandeling te volgen omdat ik onder druk werd gezet om te komen.	1	2	3	4	5	6	7
18.	Ik werd in feite gedwongen om een behandeling te volgen.	1	2	3	4	5	6	7

Dutch Health Care Climate Questionnaire (HCCQ)

Deze vragenlijst bestaat uit stellingen die gaan over uw behandelaar. Verschillende behandelaars hebben verschillende stijlen in hoe ze omgaan met cliënten, en we willen graag weten hoe uw ervaringen zijn met uw behandelaar.
Uw antwoorden zijn vertrouwelijk en zullen niet besproken worden met uw behandelaar. Antwoordt u alstublieft eerlijk.

Omcirkel een cijfer van **1 (helemaal niet mee eens) tot 7 (helemaal mee eens)** achter elke stelling.

		Helemaal **niet** mee eens						Helemaal mee eens
1.	Ik heb het gevoel dat mijn behandelaar mij keuzes biedt.	1	2	3	4	5	6	7
2.	Ik voel me begrepen door mijn behandelaar.	1	2	3	4	5	6	7
3.	Ik kan open zijn naar mijn behandelaar tijdens onze afspraken.	1	2	3	4	5	6	7
4.	Mijn behandelaar geeft aan dat hij vertrouwen heeft in mijn vermogen om te veranderen.	1	2	3	4	5	6	7
5.	Ik heb het gevoel dat mijn behandelaar mij accepteert.	1	2	3	4	5	6	7
6.	Mijn behandelaar heeft ervoor gezorgd dat ik mijn aandoening echt begrijp en wat ik kan doen.	1	2	3	4	5	6	7
7.	Mijn behandelaar moedigt mij aan om vragen te stellen.	1	2	3	4	5	6	7
8.	Ik heb veel vertrouwen in mijn behandelaar.	1	2	3	4	5	6	7
9.	Mijn behandelaar beantwoordt mijn vragen volledig en zorgvuldig.	1	2	3	4	5	6	7
10.	Mijn behandelaar luistert naar hoe ik graag dingen doe.	1	2	3	4	5	6	7
11.	Mijn behandelaar kan erg goed omgaan met emoties van mensen.	1	2	3	4	5	6	7
12.	Ik heb het gevoel dat mijn behandelaar om mij geeft als persoon.	1	2	3	4	5	6	7
13.	Ik voel me niet goed bij de manier waarop mijn behandelaar tegen me praat.	1	2	3	4	5	6	7
14.	Mijn behandelaar probeert te begrijpen hoe ik de dingen zie, voordat hij/zij een nieuwe manier voorstelt om dingen te doen.	1	2	3	4	5	6	7
15.	Ik voel me in staat om mijn gevoelens te delen met mijn behandelaar.	1	2	3	4	5	6	7

Short Motivation Feedback List (SMFL)

Naam behandelaar:
Naam cliënt:

VERSIE VOOR BEHANDELAAR

Hieronder volgen uitspraken over het deelnemen aan de behandeling. Met deelnemen aan de behandeling bedoelen we niet alleen dat de cliënt aanwezig is op afspraken, maar ook bijvoorbeeld het opvolgen van adviezen van de behandelaar en het innemen van eventuele medicatie. Omcirkel het cijfer waarvan u denkt dat het de mening van de cliënt op dit moment het beste weergeeft.

	Helemaal **niet** mee eens										Helemaal mee eens
1. De cliënt blijft op dit moment in behandeling omdat… **…hij/zij zo problemen op kan lossen.**	0	1	2	3	4	5	6	7	8	9	10
2. De cliënt blijft op dit moment in behandeling omdat… **…hij/zij zo een beter leven kan leiden.**	0	1	2	3	4	5	6	7	8	9	10
3. De cliënt blijft op dit moment in behandeling omdat… **…hij/zij anderen niet teleur mag stellen.**	0	1	2	3	4	5	6	7	8	9	10
4. De cliënt blijft op dit moment in behandeling omdat… **…hij/zij het interessant vindt.**	0	1	2	3	4	5	6	7	8	9	10
5. De cliënt blijft op dit moment in behandeling omdat… **…hij/zij zichzelf niet teleur mag stellen.**	0	1	2	3	4	5	6	7	8	9	10
6. De cliënt blijft op dit moment in behandeling omdat… **…anderen vinden dat hij/zij dat moet.**	0	1	2	3	4	5	6	7	8	9	10
7. De cliënt blijft op dit moment in behandeling omdat… **…hij/zij zich trots zal voelen als hij/zij dat doet.**	0	1	2	3	4	5	6	7	8	9	10
8. De cliënt blijft op dit moment in behandeling omdat… **…hij/zij door anderen gewaardeerd word als hij/zij dat doet.**	0	1	2	3	4	5	6	7	8	9	10

Naam client:

Datum:

SMFL - VERSIE VOOR CLIËNT

Hieronder volgen uitspraken over het deelnemen aan de behandeling. Met deelnemen aan de behandeling bedoelen we niet alleen dat u als cliënt aanwezig bent op afspraken, maar ook bijvoorbeeld het opvolgen van adviezen van de behandelaar en het innemen van eventuele medicatie.

Omcirkel het cijfer dat uw mening op dit moment het beste weergeeft.

	Helemaal **niet** mee eens										Helemaal mee eens
1. Ik ben op dit moment in behandeling omdat… **…ik zo problemen op kan lossen.**	0	1	2	3	4	5	6	7	8	9	10
2. Ik ben op dit moment in behandeling omdat… **…ik zo een beter leven kan leiden.**	0	1	2	3	4	5	6	7	8	9	10
3. Ik ben op dit moment in behandeling omdat… **…ik anderen niet teleur mag stellen.**	0	1	2	3	4	5	6	7	8	9	10
4. Ik ben op dit moment in behandeling omdat… **…ik het interessant vind.**	0	1	2	3	4	5	6	7	8	9	10
5. Ik ben op dit moment in behandeling omdat… **…ik mezelf niet teleur mag stellen.**	0	1	2	3	4	5	6	7	8	9	10
6. Ik ben op dit moment in behandeling omdat… **…anderen vinden dat ik dat moet.**	0	1	2	3	4	5	6	7	8	9	10
7. Ik ben op dit moment in behandeling omdat… **…ik me trots zal voelen als ik dat doe.**	0	1	2	3	4	5	6	7	8	9	10
8. Ik ben op dit moment in behandeling omdat… **…ik door anderen gewaardeerd word als ik dat doe.**	0	1	2	3	4	5	6	7	8	9	10

Supplementary material for Chapter 6

Changes to the perceived legal pressure scale such that it represents perceived external pressure

In the original TMS-f [118], perceived legal pressure is the patient's perception of the external pressure through the legal system. As the current study aimed to explore whether the IM is also applicable outside a forensic psychiatric setting, the current study decided to adapt the construct of perceived legal pressure into a more broad perceived external pressure. This adjustment can be justified by considering that only a subgroup of outpatients with SMI will be referred to or pressured into psychiatric treatment via the legal system, while (most) others will likely experience other pressures that drive their motivation for engaging with treatment (i.e. family, friends, partner, assertive outreaching clinicians).

Table S1 (see next page) shows the 9 items of the original Dutch TMS-f and how these were adapted to represent 9 Dutch items for perceived external pressure. The last two columns of Table S1 show their translations in English, which were made for the purpose of this supplement only, such that non-Dutch readers can also see the precise formulation and understand their content.

Table S1. Items of the original perceived legal pressure scale compared to the items on the perceived external pressure scale

Item number	Original TMS-f (items in Dutch)	Current study (items in Dutch)	Original TMS-f (loosely translated to English for the purpose of this supplement only)	Current study (loosely translated to English for the purpose of this supplement only)
5	Als therapeuten vinden dat ik mij onvoldoende inzet, zou dat vervelende justitiële gevolgen voor mij kunnen hebben	Als therapeuten vinden dat ik mij onvoldoende inzet, zou dat vervelende gevolgen voor mij kunnen hebben.	If therapists feel that I do not show enough effort for the treatment, this could have negative legal consequences for me	If therapists feel that I do not show enough effort for the treatment, this could have negative consequences for me
13	Wanneer ik door de kliniek weggestuurd zou worden, zou ik met zekerheid problemen krijgen met justitie	Wanneer ik door de kliniek weggestuurd zou worden, zou ik met zekerheid problemen krijgen.	If the clinic would send me away, this would certainly result into problems with the legal authorities for me.	If the clinic would send me away, this would certainly result into problems for me.
25	De justitiële stok achter de deur stelt bij mij weinig voor	De stok achter de deur van anderen stelt bij mij weinig voor	The big stick of the justice department does not impress me much	The big stick of other people does not impress me much
34	Het is best wel mogelijk dat justitie een oogje zou dichtknijpen, als ik de behandeling zou afbreken	Het is best wel mogelijk dat anderen een oogje zouden dichtknijpen, als ik de behandeling zou afbreken.	It is possible that the justice department would turn a blind eye, if I were to terminate the treatment	It is possible that other people would turn a blind eye, if I were to terminate the treatment
43	De druk van justitie voel ik sterk	De druk van anderen voel ik sterk.	I feel a strong pressure from the justice department	I feel a strong pressure from others
57	De justitiële gevolgen wanneer ik de behandeling nu zou afbreken zouden wel meevallen	Wanneer ik de behandeling nu zou afbreken, zouden de gevolgen wel meevallen.	If I were to drop out of treatment right now, the legal consequences would not be so bad	If I were to drop out of treatment right now, the consequences would not be so bad
66	Als de kliniek mij voortijdig zou wegsturen, zou justitie mijn straf zeker ten uitvoer leggen	Als de kliniek mij voortijdig zou wegsturen, zou ik zeker problemen met anderen krijgen.	If the clinic were to dismiss me prematurely, the legal department would certainly follow through with my punishment	If the clinic were to dismiss me prematurely, I would certainly get into problems with others
76	Als ik niet in behandeling was gegaan, dan had dat justitiële gevolgen gehad waar ik nogal tegenop zie	Als ik niet in behandeling was gegaan, dan had dat gevolgen gehad waar ik nogal tegenop zie.	If I had not entered into treatment, it would have had legal consequences that I find dreadful	If I had not entered into treatment, it would have had consequences that I find dreadful
85	Door mijn justitiële situatie heb ik geen echte keus, ik moet de behandeling wel afmaken	Door mijn situatie heb ik geen echte keus, ik moet de behandeling wel afmaken	Because of my legal situation, I don't really have a choice. I have to finish the treatment.	Because of my situation, I don't really have a choice. I have to finish the treatment.

In Table S2, the standardized factor loadings are shown that resulted from testing single-factor models on each of the subscales of the TMS-f, using confirmatory factor analyses (CFAs) with the robust maximum likelihood (MLR) estimation method.

Table S2. Standardized factor loadings and residuals (standard errors) of items for each TMS-f subscale

Sub-scale	Item	Standar-dized factor loading	Residuals (standard errors)
PR	2	0,465	0,784
	19	0,604	0,635
	78	0,628	0,606
	11	0,384	0,853
	26	0,763	0,418
	36	0,451	0,797
	49	0,610	0,628
	58	0,533	0,716
	70	0,568	0,677
DS	44	0,462	0,787
	71	0,586	0,657
	9	0,696	0,516
	18	0,760	0,422
	30	0,684	0,532
	40	0,747	0,442
	54	0,784	0,385
	63	0,716	0,487
	83	0,838	0,298
EP	25	0,181	0,967
	34	0,208	0,957
	57	0,555	0,692
	5	0,282	0,920
	13	0,586	0,657
	43	0,161	0,974
	66	0,468	0,781
	76	0,537	0,712
	85	0,391	0,847
CT	1	0,570	0,675
	14	0,264	0,930
	51	0,516	0,734
	24	0,489	0,761
	41	0,601	0,639
	61	0,609	0,629
	67	0,609	0,629
	80	0,577	0,667
	27	0,470	0,779

Sub-scale	Item	Standardized factor loading	Residuals (standard errors)
ST	15	0,665	0,558
	52	0,634	0,598
	69	0,590	0,652
	3	0,753	0,433
	21	0,737	0,457
	33	0,682	0,535
	47	0,623	0,612
	62	0,513	0,737
	79	0,552	0,695
OE	6	0,545	0,703
	12	0,758	0,425
	35	0,739	0,454
	39	0,758	0,425
	53	0,618	0,618
	64	0,533	0,716
	77	0,675	0,544
	84	0,668	0,554
	46	0,398	0,842
MET	17	0,502	0,748
	28	0,441	0,806
	37	0,541	0,707
	42	0,546	0,702
	48	0,520	0,730
	55	0,531	0,718
	68	0,518	0,732
	82	0,449	0,798
	10	0,407	0,834
	23	0,424	0,820
	31	0,550	0,698
	73	0,480	0,770
	7	0,447	0,800
	20	0,273	0,925
	60	0,547	0,701
	74	0,415	0,828

Note: PR = problem recognition, DS = distress, EP = external pressure, CT = perceived costs of treatment, ST = perceived suitability of treatment, OE = outcome expectancy, MET = motivation to engage in treatment.

Table S3 shows the item properties of the 9 items represented in the perceived external pressure scale. It was decided to retain all items for subsequent use in order to maximize the comparability with the original TMS-f perceived legal pressure scale.

Results for the single factor CFAs for each TMS-f scale are shown in Table S4. For all CFAs, the MLR estimation method was used. Using the criteria as outlined in the main manuscript (see Statistical Analyses), it appears that the scales showed borderline to acceptable model fit. The best fit was found for the EP-subscale, although this scale showed the lowest congeneric estimate of reliability (0.61).

In the next step, a CFA was performed including all six internal determinants as predictors for motivation to engage in treatment and including correlations between the internal determinants as specified by Drieschner and Boomsma [116]. In line with Drieschner and Boomsma [116], *"we followed the recommendation of Beauducel and Wittmann [297] to give priority to the combination of the SRMR and RMSEA. This recommendation was based on the finding that in models with low or moderate factor loadings, incremental fit indices such as the TLI and the CFI penalize unspecified small secondary factor loadings (i.e., loadings on unintended factors) to a degree that such models "would only have a chance to be accepted when incremental fit indexes and the GFI are not used for model evaluation" (p. 70). In multidimensional questionnaires, secondary factor loadings are hardly avoidable, if only because of formal or linguistic features shared by items of different scales"*(p. 10).

The CFA including all six IDs as predictors for MET, showed an acceptable combination of RMSEA <0.06 and SRMR <.10, while CFI and TLI were low ($\chi 2/df=1.71$, RMSEA=0.05, CFI=0.74, TLI=0.73, SRMR=0.09). These fit indices of RMSEA and SRMR were comparable to those found by Drieschner and Boomsma[116] , while the CFI and TLI were found to be somewhat lower in the current study. In line with the choices made by Drieschner and Boomsma [116], it was decided that the current results of the CFAs justified using this model for the TMS-f for subsequent analyses.

In Table S5, the Pearson correlations between the observed sum scores on the subscales of the TMS-f as found in the current study are shown below the diagonal (i.e. lower triangle). For comparison, the correlations found in the study by Drieschner and Boomsma [116] are shown above the diagonal (i.e. upper triangle). Correlations in our study that appeared to stand out (regarding strength and direction) from those found by Drieschner and Boomsma were those between Problem Recognition and External Pressure (r=0.54 versus r=-0.12) and between Distress and External Pressure (r=0.28 versus r=-0.15), respectively. These substantial differences may be explained by changes in the External Pressure -scale, such that external pressure is more closely affiliated with problem recognition than legal pressure. For example, a patient who is convinced that leaving the treatment prematurely will lead to certain negative consequences (e.g. problems with partners, family, friends or in general) may be more likely to also recognize that there are problems for which psychiatric treatment is indicated, maybe more so than a patient who is merely pressured into treatment by the legal system. A similar line of reasoning may apply to the higher correlation that was found in the current study between Distress and External Pressure, compared to Drieschner and Boomsma, as it can be argued that patients who expect that they will experience negative consequences in multiple life-domains (e.g. problems with relatives and friends) if they were to leave the treatment prematurely, may be more likely to also experience higher levels of distress, compared to a patient who expects negative consequences in the legal domain only.

Similar to the findings of Drieschner and Boomsma, motivation was strongly correlated with the subscales costs of treatment, sutability of treatment and outcome expectancy. It should be noted that the apparently different directions of associations between the costs of treatment-scale in our study compared to Drieschner and Boomsma, have to be attributed to differences in coding (i.e. we coded this subscale such that a higher score represents higher perceived costs of treatment). As such, in the interpretation of the associations with the costs of treatment -scale, these differences in direction between the studies should be ignored.

Descriptive statistics of the subscales of the TMS-f are shown in Table S6. Again for comparison, both the distribution of the sum scores on the TMS-f scales of our sample and the total sample used by Drieschner and Boomsma are shown.

Table S3. Item properties of the perceived external pressure scale and factor loadings

Item number	Mean	Variance	Skewness (standard error)	Kurtosis (standard error)	Observed range	Factor Loading
5	3.18	2.08	-0.17 (0.14)	-1.29 (0.29)	1 to 5	0.282
13	2.63	2.28	0.32 (0.14)	-1.35 (0.29)	1 to 5	0.586
25	3.53	1.74	-0.50 (0.14)	-0.80 (0.29)	1 to 5	0.181
34	3.60	1.69	-0.46 (0.14)	-0.86 (0.29)	1 to 5	0.208
43	2.74	2.07	0.28 (0.14)	-1.24 (0.29)	1 to 5	0.161
57	3.64	1.74	-0.55 (0.14)	-0.86 (0.29)	1 to 5	0.555
66	3.28	2.12	-0.33 (0.14)	-1.21 (0.29)	1 to 5	0.468
76	1.94	1.35	1.14 (0.14)	0.48 (0.29)	1 to 5	0.537
85	2.53	2.15	0.45 (0.14)	-1.16 (0.29)	1 to 5	0.391

Table S4. Results of single factor CFAs for each TMS-f scale

Scale (number of items)	χ2	df	χ2/df	p-value	CFI	TLI	RMSEA	SRMR	Reliability estimate (congeneric)
PR (9)	77.77	27	2.88	<0.001	0.887	0.850	0.08	0.06	0.804
DS (9)	77.00	27	2.85	<0.001	0.941	0.921	0.08	0.04	0.897
EP (9)	30.86	27	1.14	0.2768	0.973	0.964	0.02	0.04	0.612
CT (9)	51.06	27	1.89	0.0034	0.927	0.902	0.06	0.05	0.775
ST (9)	57.01	27	2.11	<0.001	0.943	0.923	0.06	0.04	0.862
OE (9)	79.96	27	2.96	<0.001	0.912	0.883	0.08	0.05	0.860
MET (16)	216.05	104	2.08	<0.001	0.832	0.806	0.06	0.06	0.824

Table S5. Pearson correlations between observed sum scores on subscales of the TMS-f

	PR	DS	CT	ST	OE	LP	MET
PR		0.60	0.08	0.32	-0.04	-0.12	0.18
DS	**0.54**		-0.19	-0.04	-0.45	-0.15	-0.16
CT	0.02	**0.35**		0.44	0.43	-0.13	0.36
ST	**0.12**	**-0.34**	**-0.59**		0.65	0.06	0.50
OE	-0.11	**-0.55**	**-0.61**	**0.68**		0.12	0.61
EP	**0.54**	**0.28**	0.01	**0.24**	0.08		0.06
MET	0.10	**-0.18**	**-0.50**	**0.38**	**0.51**	0.07	

Below diagonal: correlations found in the current study. Above diagonal: correlations found in the study by Drieschner and Boomsma [116]. PR = problem recognition; DS = distress; CT = perceived Costs of the Treatment; ST = perceived Suitability of the Treatment; OE = outcome expectancy; LP = perceived Legal Pressure; EP = perceived external pressure, MET = Motivation to Engage in the Treatment. Boldface indicates that correlation is significant at the 0.05 level (two-tailed).

Table S6. Descriptive statistics of the observed sum scores on the subscales of the TMS-f

Scale	Statistic	Our sample N = 294	Drieschner and Boomsma N = 376
PR	Mean	30.25	32.50
	S.D.	7.75	7.76
	Skewness (standard error)	-0.23 (0.14)	-0.68
	Kurtosis (standard error)	-0.51 (0.28)	0.07
DS	Mean	25.70	27.11
	S.D.	9.61	8.83
	Skewness (standard error)	0.09 (0.14)	-0.06
	Kurtosis (standard error)	-1.01 (0.28)	-0.84
CT	Mean	34.06	32.85
	S.D.	6.88	6.91
	Skewness (standard error)	-0.52 (0.14)	-0.38
	Kurtosis (standard error)	-0.14 (0.28)	-0.33
ST	Mean	34.96	35.67
	S.D.	7.17	6.72
	Skewness (standard error)	-0.36 (0.14)	-0.92
	Kurtosis (standard error)	-0.49 (0.28)	1.01
EP / LP	Mean	30.41	24.00
	S.D.	5.96	9.36
	Skewness (standard error)	-0.06 (0.14)	0.15
	Kurtosis (standard error)	-0.18 (0.28)	-1.00
MET	Mean	47.23	51.65
	S.D.	11.74	12.39
	Skewness (standard error)	0.08 (0.14)	-0.19
	Kurtosis (standard error)	0.08 (0.28)	-0.26

Supplementary material for Chapter 7

Psychometric properties of the Dutch Processes of Change scale

The processes of change were measured by asking patients to indicate how often they made use of the strategies described in 20 statements, where each process of change was represented by two statements [197]. The statements were rated on a five point Likert scale, ranging from 1 (never) to 5 (repeatedly), consistent with other short measures of the processes of change [57,96,171,172].

The item properties of the 20 Dutch statements are shown in Table S1 as well as the congeneric estimates of reliability of the experiential and behavioural processes of change.

Table S1. Item properties of the Dutch processes of change scale

	English	Dutch	Mean/ variance	Skewness/ kurtosis	Observed range	Loading	Congeneric estimate
Items addressing experiential processes of change							
5	Warnings about health risks related to my unhealthy behaviours upset me	Waarschuwingen over de gevaren van mijn ongezonde gewoontes raken mij emotioneel	3.21 / 1.56	-0.19 / -0.86	1 to 5	0.484	0.705
6	I get upset when I hear or read about illnesses caused by my problems	Ik raak van streek als ik denk aan onderzoeken die gaan over aandoeningen veroorzaakt door mijn klachten	2.53 / 1.57	0.43 / -0.74	1 to 5	0.409	
7	I consider the view that my behaviour is harmful to my environment	Ik denk erover na dat mijn gedrag schadelijk is voor mijn omgeving	2.39 / 1.59	0.43 / -0.96	1 to 5	0.467	
8	I am aware that my unhealthy behaviours are harmful to my environment	Ik ben me ervan bewust dat mijn ongezonde gewoonten schadelijk zijn voor mijn omgeving	2.65 / 1.68	0.25 / -1.02	1 to 5	0.507	
15	I received signals from my environment that reminded me of addressing my problems	Ik vang signalen op uit mijn omgeving die me herinneren aan het aanpakken van mijn klachten	3,13 / 1.48	-0.16 / -0.89	1 to 5	0.443	
16	I find that society changes such that life is easier for people without problems	Ik merk dat de samenleving verandert waardoor het leven makkelijker is voor mensen die geen klachten hebben	3,31 / 1.52	-0.38 / -0.74	1 to 5	0.266	
17	I am disappointed in myself because of my problems	Door mijn klachten voel ik me teleurgesteld in mezelf	3.00 / 1.65	-0.10 / 0.07	1 to 5	0.615	
18	I get upset when I think about my problems	Ik raak van streek als ik aan mijn klachten denk	2.92 / 1.62	-0.97 / 0.18	1 to 5	0.627	
Items addressing behavioural processes of change							
1	I remember information about how to address my problems	Ik herinner mij informatie die ging over het aanpakken van mijn klachten	3.47 / 1.18	-0.51 / -0.22	1 to 5	0.465	0.766
2	I think about information that is concerned with how to address my problems	Ik denk na over informatie die gaat over hoe je mijn klachten kunt aanpakken	3.81 / 0.95	-0.73 / 0.43	1 to 5	0.579	
3	I told myself that I had a choice in addressing my problems	Ik zeg tegen mezelf dat ik kan kiezen of ik mijn klachten aanpak	3.34 / 1.44	-0.37 / 0.67	1 to 5	0.536	
4	I made a commitment to myself to address my problems	Ik spreek met mezelf af om mijn klachten aan te pakken	3.82 / 1.10	-0.87 / 0.42	1 to 5	0.690	
9	I have someone who listens when I need to talk about my problems	Ik heb iemand die naar mij luistert als ik over mijn klachten wil praten	4.04 / 0.93	-1.11 / 1.17	1 to 5	0.373	
10	I have someone I can count on when I'm having problems	Ik heb iemand waarop ik kan rekenen als ik klachten heb	4.12 / 0.97	-1.16 / 1.01	1 to 5	0.421	
13	When I am tempted to give in to my problems, I think about something else	Wanneer ik in de verleiding kom om toe te geven aan ongezonde gewoonten, denk ik aan iets anders	2.97 / 1.50	-0.09 / -0.89	1 to 5	0.496	
14	Instead of giving in to unwanted behaviours, I do something else when I want to relax	In plaats van toegeven aan de ongezonde gewoonte, doe ik iets anders wanneer ik me wil ontspannen	3.33 / 1.42	-0.30 / -0.72	1 to 5	0.502	

19	I will be rewarded by others when I don't relapse to my unhealthy behaviours	Ik zal beloond worden door anderen als ik niet terugval op mijn ongezonde gewoonten	2.70 / 1.66	0.18 / -1.02	1 to 5	0.388
20	I reward myself when I don't relapse to my unhealthy behaviours	Ik beloon mezelf als ik niet terugval op mijn ongezonde gewoonten	3.25 / 1.73	-0.31 / -0.92	1 to 5	0.500

*Items 11 and 12 showed substantial cross-loadings and were therefore removed.

Analysis strategy for model testing using Structural Equation Modeling (SEM)

Latent variables were identified for the stages of change as assessed with the URICA-D, the experiential and behavioural processes of change and all outcome variables. Using classical reliability theory reformulated in terms of confirmatory factor analysis, the observed variables were corrected for unreliability. Congeneric reliability estimates [203,219] were obtained as both the common factors loadings and the residuals turned out to differ. Subsequently, a factor analysis model for each observed variable was defined , in which the factor loading was fixed at 1.0 and the residual variance of that factor (i.e. 1- reliability) was multiplied by the variance of the variable at issue.

Next, the plausibility and stability of the model was investigated for both assessment methods. The model as depicted in Figure 1 was fitted to the data for the full sample using the baseline and follow-up measurements separately. It was tested whether the baseline model showed good overall fit. If not, it was evaluated how it could be adapted such that the fit would improve or alternatively, whether the model could be simplified while not violating the overall model fit. The most plausible model was obtained by evaluating the model fit criteria and standardized residuals. The following measures were used to test for adequacy of the model fit: $\chi 2$ for model fit (low and non-significant values of the $\chi 2$ were desired; P-value > 0.05); $\chi 2$/df ratio (a value <2.0 was considered to be acceptable); information criteria including Akaike (AIC), Bayesian (BIC), sample-size adjusted BIC (SS-BIC) (the smaller the better); Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) (high values are desired (> 0.95), values > 1.0 point to over identification [201,220,221]; Root Mean Square Error of Approximation (RMSEA: a value < 0.05 indicates a close fit [222]; and Standardized Root Mean Squares of Residuals (SRMR: a value of < 0.05 indicates a reliable fit)[201]. The MLR $\chi 2$ difference test was used to compare different models which were nested. The $\chi 2$ difference was based on log-likelihood values and scaling correction factors obtained with the MLR estimator, using the formula $\Delta\chi 2 = -2*(L0 - L1)/cd$ where L0 is the log likelihood of the restricted (nested) model, L1 is the log likelihood of the unrestricted model and cd is the difference test scaling correction (which is based on scaling correction factors (c0 and c1) and number of parameters (p0 and p1) for the restricted and unrestricted models, respectively).

To address the stability of the most plausible structural model (objective 2) across time and patient groups, additional analyses were performed. The invariance of the most plausible path model across time was evaluated by testing the invariance of the regression estimates of the latent variables, by comparing those assessed at baseline with those assessed at follow-up using the MLR $\chi 2$ difference test. Fitting both latent path models (baseline and follow-up) jointly was used to test whether the regression estimates of both time points could be considered invariant. Specifically, a non-significant MLR $\chi 2$ difference test between the model with all regression estimates constrained to be equal for the corresponding measurements versus all regression estimates unconstrained was considered statistical evidence for the latent path model being invariant across time. Individual estimates were regarded statistically significant if the two-sided P-values were < 0.05. The correlations of the latent variables between the corresponding measurements were allowed to be free as the measurements were repeated. The next step was to test whether this model was also invariant across different patient groups (personality disorders versus psychotic disorders). The MLR $\chi 2$ difference test was used to test equality constraints between nested models. Finally, to test to what extent the obtained IM-model has utility for clinical practice, explained variances (R^2) on the dependent variables in the model, including treatment engagement, psychosocial functioning and quality of life, were reported.

Results of SEM

Associations between stages of change, treatment engagement and clinical outcomes: fit of the structural model

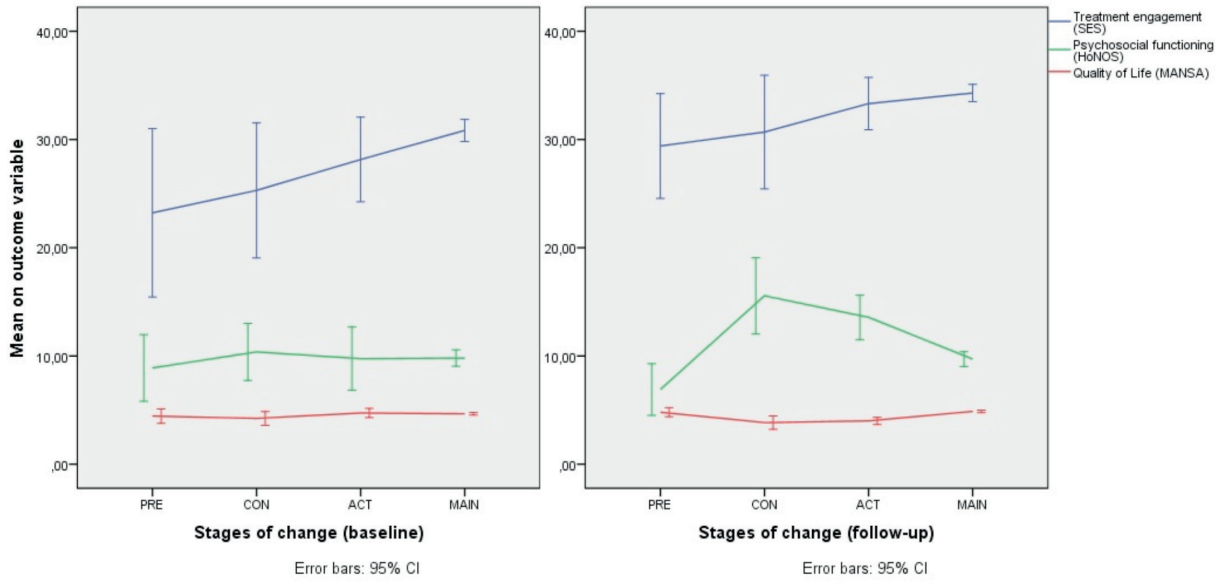
The hypothesized model as depicted in Figure 2 was fitted to the data at baseline and at follow-up, for both the staging algorithm and the URICA-D. Results are shown in Table S3. Starting with the staging algorithm, the model in Figure 2 provided good fit to the data at baseline: $\chi 2/df=0.68$, RMSEA=0.00, CFI=1.00, TLI=1.04,

Table S2. Spearman intercorrelations of URICA-D stages of change, processes of change and outcomes for the total study sample

	Baseline assessment							Follow-up assessment								
	P	C	A	M	TE	PF	QL	EXP	BEH	P	C	A	M	TE	PF	QL
P																
C	**-.26**															
A	**-.29**	**.44**														
M	**-.19**	**.64**	**.33**													
TE	-.05	-.02	**.15**	**-.08**												
PF	.06	**-.29**	-.01	**-.34**	**.35**											
QL	.06	**-.26**	.10	**-.25**	**.39**	**.57**										
Follow-up assessment																
EXP	-.08	**.31**	.12	**.33**	-.02	.12	**-.17**									
BEH	**-.07**	**.21**	**.35**	**.17**	**.23**	-.12	**.21**	**.25**								
P	**.40**	**-.17**	**-.18**	**-.18**	-.06	.07	**.13**	**-.23**	**-.12**							
C	**-.20**	**.43**	**.29**	**.35**	.00	**-.15**	-.13	**.44**	**.22**	**-.33**						
A	**-.24**	**.24**	**.51**	**.23**	**.26**	**.12**	**.16**	**.14**	**.48**	**-.29**	**.44**					
M	**-.14**	**.39**	**.31**	**.49**	.06	-.09	-.06	**.44**	**.23**	**-.32**	**.62**	**.45**				
TE	-.07	.06	**.14**	.08	**.62**	**.21**	**.25**	-.08	**.14**	**-.14**	.06	**.31**	**.16**			
PF	.04	**-.18**	-.00	**-.27**	**.30**	**.52**	**.40**	**.29**	-.10	**.12**	**-.27**	**.04**	**-.29**	**.23**		
QL	**.15**	**-.22**	.07	**-.21**	**.25**	**.33**	**.58**	**.28**	**.28**	**.20**	**-.24**	**.17**	**-.27**	**.20**	**.61**	

Boldface indicates $p < 0.05$ (two-tailed). URICA-D = University of Rhode Island Change Assessment – Dutch version, P = precontemplation, C= contemplation, A = action, M = maintenance, TE = Treatment engagement, PF = Psychosocial functioning, QL = Quality of life.

Figure S1. Means for outcome variables across the stages of change, as assessed with the staging algorithm



SRMR=0.02) and bad fit at follow-up: χ2/df=4.86, RMSEA=0.12, CFI=0.79, TLI=0.62, SRMR=0.08. The model fit improved slightly at follow-up when stages were regressed onto the previous stage (χ2/df=4.86, RMSEA=0.12, CFI=0.91, TLI=0.77, SRMR=0.08), while model fit for the baseline assessment remained exactly the same. When Figure 2 was fitted for the URICA-D, the model showed borderline fit at baseline (χ2/df=3.53, RMSEA=0.09, CFI=0.94, TLI=0.84, SRMR=0.09) and bad fit at follow-up (χ2/df=7.05, RMSEA=0.15, CFI=0.87, TLI=0.66, SRMR=0.12). Model fit did not change when stages were regressed onto the previous stage, nor when stages were regressed on all previous stages (please see Table S3). Despite the potential for further improvements of model fit, it was decided not to include additional paths between stages and clinical outcomes of psychosocial functioning and quality of life, as this was not in line with theory. It was therefore decided to retain model b for further analyses.

Testing the stability of the theoretical model across time and diagnostic groups

The most plausible structural models for the staging algorithm and URICA-D were tested for stability across time, by testing the invariance of the paths in the model across the two measurement occasions. To this end, a model was created in which both baseline and follow-up path models were included simultaneously. Two versions of this model were created and compared: one model in which the regression weights were allowed to be free (unconstrained) for the baseline and follow-up measurements and one model in which the regression weights for the corresponding paths at baseline and follow-up were constrained to be similar. The test for invariance across time was represented by the MLR χ2 difference test between these two models, where a non-significant χ2-test was considered statistical evidence for the path model being invariant across time. As can be seen in Table S4, the χ2-test for the staging algorithm did not reach statistical significance for the comparison across time (Δχ2=11.13, Δdf=9, p=0.27), implying that the path model was invariant across time. That is, the regression coefficients between variables in the model could be considered similar for the baseline and follow-up assessments. This process was repeated for comparisons of patient diagnostic groups, for both time points separately. Both at baseline and at follow-up assessment, the model was found to be invariant for patients with psychotic disorders and personality disorders as shown by the non-significant MLR χ2 difference tests (Δχ2=7.62, Δdf=9, p=0.85 and Δχ2=14.44, Δdf=9, p=0.11, respectively).

Similarly, tests were performed to evaluate the invariance across time and diagnostic groups for the URICA-D. As can be seen in Table S4, the URICA-D also showed invariance across time (Δχ2=9.77, Δdf=9, p=0.37), and across diagnostic groups for both time points (Δχ2=8.55, Δdf=9, p=0.48 and Δχ2=7.92, Δdf=9, p=0.54, respectively).

Table S3. Model fit information for the staging algorithm and URICA-D

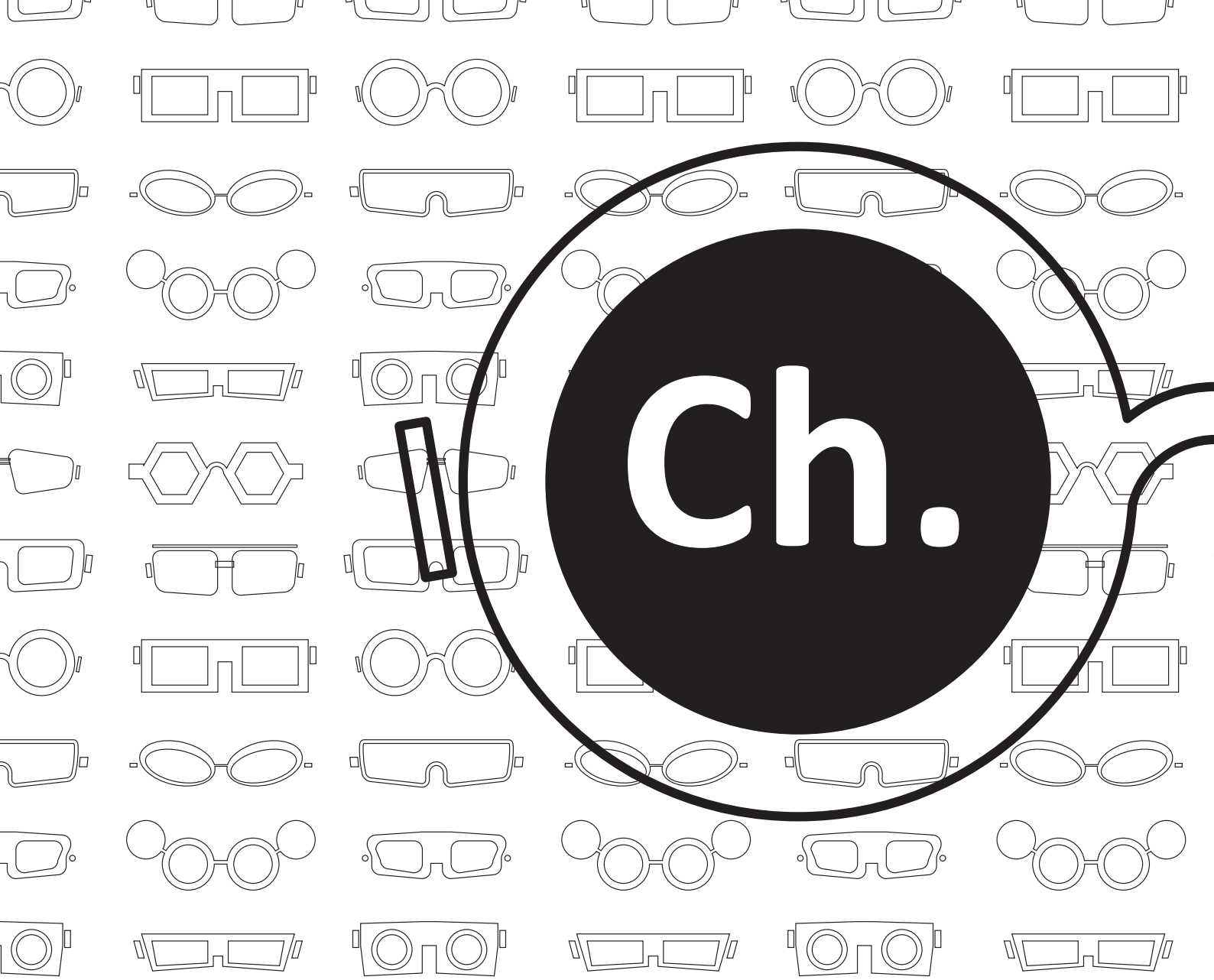
Models for the staging algorithm	C or U	χ2	df	χ2/df	p-value	RMSEA	90% C.I. for RMSEA	CFI	TLI	SRMR	AIC	BIC	SS-BIC
1a. Baseline (figure 2)	-	5.42	8	0.68	0.71	0.00	0.00 to 0.05	1.00	1.04	0.02	199.79	299.25	213.63
1b. Stages regressed on previous adjacent stage, and including correlations between non-adjacent stages	-	5.42	8	0.68	0.71	0.00	0.00 to 0.05	1.00	1.02	0.02	199.79	299.25	213.63
1c. Stages regressed on all previous stages	-	5.42	8	0.68	0.71	0.00	0.00 to 0.05	1.00	1.02	0.02	199.79	299.25	213.63
2a. Follow-up (figure 2)	-	38.90	8	4.86	<0.01	0.12	0.08 to 0.15	0.79	0.62	0.08	403.01	502.47	416.85
2b. Stages regressed on previous adjacent stage, and including correlations between non-adjacent stages		38.90	8	4.86	<0.01	0.12	0.08 to 0.15	0.91	0.77	0.08	403.01	502.47	416.85
2c. Stages regressed on all previous stages	-	38.90	8	4.86	<0.01	0.12	0.08 to 0.15	0.91	0.77	0.08	541.88	633.96	554.69
Models for the URICA-D	**C or U**	**χ2**	**df**	**χ2/df**	**p-value**	**RMSEA**	**90% C.I. for RMSEA**	**CFI**	**TLI**	**SRMR**	**AIC**	**BIC**	**SS-BIC**
1a. Baseline (figure 2)	-	28.25	8	3.53	<0.01	0.09	0.06 to 0.13	0.94	0.84	0.09	3108.55	3208.00	3122.38
1b. Stages regressed on previous adjacent stage, and including correlations between non-adjacent stages	-	28.25	8	3.53	<0.01	0.09	0.06 to 0.13	0.94	0.84	0.09	3108.55	3208.00	3122.38
1c. Stages regressed on all previous stages	-	28.25	8	3.53	<0.01	0.09	0.06 to 0.13	0.94	0.84	0.09	3108.55	3208.00	3122.38
2a. Follow-up (figure 2)	-	56.39	8	7.05	<0.01	0.15	0.11 to 0.18	0.87	0.66	0.12	2581.34	2679.96	2594.34
2b. Stages regressed on previous adjacent stage, and including correlations between non-adjacent stages	-	56.39	8	7.05	<0.01	0.15	0.11 to 0.18	0.87	0.66	0.12	2581.34	2679.96	2594.34
2c. Stages regressed on all previous stages	-	56.39	8	7.05	<0.01	0.15	0.11 to 0.18	0.87	0.66	0.12	2581.34	2679.96	2594.34

Note: C or U = Model with either constrained (C) or unconstrained (U) regression coefficients for corresponding measurements at baseline and follow-up. χ^2 = chi-square statistic; df = degrees of freedom; RMSEA = root mean square error of approximation; CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, SRMR = standardized root mean square residual; AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, SS-BIC = Sample size adjusted BIC.

Table S4. Model comparisons: Testing stability across time and patient groups, for the staging algorithm and the URICA-D

Models for the staging algorithm	C or U	χ2	df	χ2/df	Δ X2	Δ df	Δ X2 / Δ df	p-value	Interpretation based on statistical inference
3a. Baseline and follow-up jointly (as model 2b)	U	119.53	56	2.13					The model is invariant across time
3b. Baseline and follow-up jointly (as model 2b))	C	133.18	65	2.05	11.13	9	1.23	0.2669	
4a. Baseline model (as model 2b) for psychotic versus personality disorders	U	30.77	16	1.92					The model is invariant across patient groups at baseline
4b. Baseline model (as model 2b) for psychotic versus personality disorders	C	39.22	25	1.56	7.62	9	0.85	0.5728	
5a Follow-up model (as model 2b) for psychotic versus personality disorders	U	45.42	16	2.84					The model is invariant across patient groups at follow-up
5b Follow-up model (as model 2b) for psychotic versus personality disorders	C	61.56	25	2.46	14.44	9	1.60	0.1075	
Models for the URICA-D	**C or U**	**χ2**	**df**	**χ2/df**	**Δ X2**	**Δ df**	**Δ X2 / Δ df**	**p-value**	**Interpretation based on statistical inference**
3a. Baseline and follow-up jointly (as model 2b)	U	185.88	56	3.32					The model is invariant across time
3b. Baseline and follow-up jointly (as model 2b)	C	197.85	65	3.04	9.77	9	1.09	0.3694	
4a. Baseline model (as model 2b) for psychotic versus personality disorders	U	31.80	16	1.99					The model is invariant across patient groups at baseline
4b. Baseline model (as model 2b) for psychotic versus personality disorders	C	42.25	25	1.69	8.55	9	0.95	0.4798	
5a Follow-up model (as model 2b) for psychotic versus personality disorders	U	67.46	16	4.22					The model is invariant across patient groups at follow-up
5b Follow-up model (as model 2b) for psychotic versus personality disorders	C	70.94	25	2.84	7.92	9	0.88	0.5422	

Note: C or U = Model with either constrained (C) or unconstrained (U) regression coefficients for corresponding measurements at baseline and follow-up. The constrained (nested) model is the more restrictive model with more degrees of freedom than the comparison model. The grey and white shading indicates models that are rivalling (nested) models (similar shading indicates rivaling models). χ2 = chi-square statistic; df = degrees of freedom; Δ χ2 = chi-square value of the MLR difference test, Δ df = difference in degrees of freedom between the models being compared.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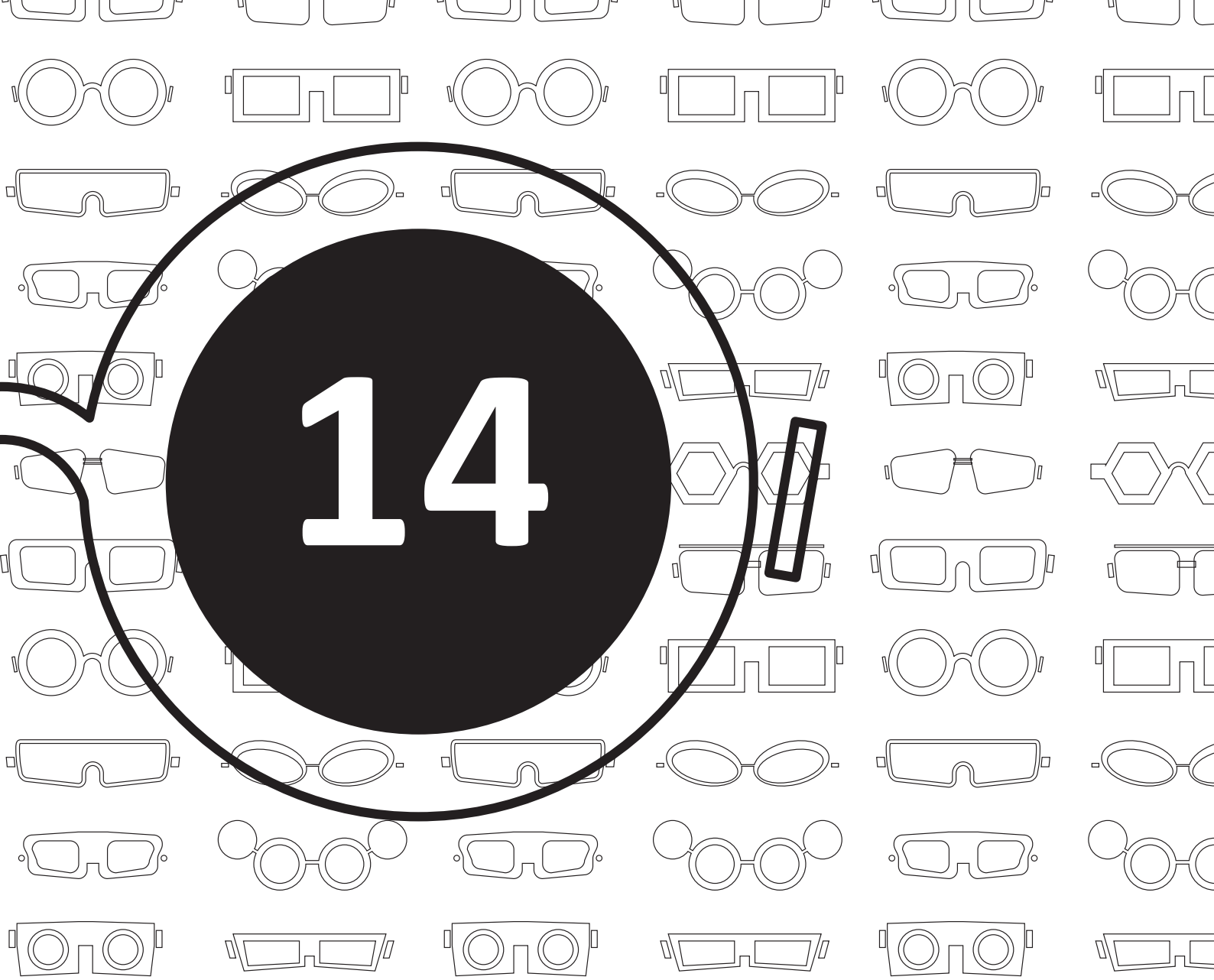


About the author

Curriculum Vitae

Eline Jochems was born in 1987 in Eindhoven, the Netherlands. After she graduated from the bilingual program ("Tweetalig VWO") at the Stedelijk College Eindhoven in 2005, she started studying Biological Psychology at Maastricht University. During her time as a bachelor student in Maastricht, she was chairman of the board of the student association, worked as a student tutor and freelance student counselor, graduated from the honours programme. She obtained her bachelor degree 'cum laude' in 2008. Subsequently, she moved to Tilburg to study Medical Psychology at Tilburg University. During the second year of this master education, she combined a clinical internship with a research internship at the department of Medical Psychology and Psychiatry of the St. Anna hospital. In 2010 she obtained her master degree ('met genoegen') and started her research project - as described in this thesis - at the Department of Psychiatry of the Erasmus MC University Medical Center Rotterdam. During this time, she also obtained her master degree in Clinical Epidemiology at the Netherlands Institute for Health and Sciences. Starting from November 2013, she started working on her dissertation part-time, while also working as a psychologist at GGz Breburg; a specialty mental health institution located in the province North Brabant, the Netherlands. From November 2013 to September 2015, she worked within this institution in Tilburg at the Topclinical Center for Body, Mind and Health ('Topklinisch Centrum voor Lichaam, Geest en Gezondheid') and since then at the Center for Anxiety and Mood Disorders (Centrum voor Angst- en Stemmingsstoornissen'). In September 2016 she will start with the post-doctoral training in health psychology ("gz-psycholoog").

PhD portfolio

Name PhD student: E.C. Jochems
Erasmus MC Department: Psychiatry
PhD period: Aug 2010 – Feb 2016

Promotors: Prof. dr. C.L. Mulder
Prof. dr. C.M. van der Feltz-Cornelis
Copromotors: Dr. A. van Dam
Dr. H.J. Duivenvoorden

PhD training	Year	Hours	ECTS
General courses			
BROK ('Basiscursus Regelgeving Klinisch Onderzoek')	2010	32	
Training in the Health of the Nations Outcome Scales (HoNOS)	2010	12	
Preconference training for Health Care professionals – Self-Determination Theory applications to practice			
Workshop Endnote	2013	8	
Workshop Systematic literature retrieval in PubMed			
Workshop Systematic literature retrieval in other databases	2013	3	
Research Integrity	2013	5	
	2013	4	
	2014		0.3
NIHES Master of Science in Clinical Epidemiology			70
Clinical Epidemiology	2010		
Courses for the Quantitative Researcher	2010		
Erasmus Summer Programme 2011	2011		
Psychiatric Epidemiology	2011		
Health Services: Research and Practice	2011		
Repeated Measurements in Clinical Studies	2012		
Missing Values in Clinical Research	2012		
Erasmus Summer Programme 2012	2012		
Study Design	2012		
Methodological Topics in Epidemiologic Research	2012		
Modern Statistical Methods	2012		
Research proposal and oral research presentation	2012		
Presentations and (inter)national conferences			
- Various presentations at the Department of Psychiatry of the Erasmus MC and in the mental health institutions GGZ WNB, GGz Breburg and Bavo Europoort	2010-2015		2
- Symposium Therapietrouw en ziekte-inzicht bij patiënten met psychotische stoornissen, Rotterdam, the Netherlands (attendance)	2010		1
- First European Congress on Assertive Outreach - "Crossing Borders", Rotterdam, the Netherlands (attendance)	2011		1
- 6th Annual Meeting of the Society for the Study of Motivation, Washington DC, U.S.A. (poster presentation)	2013		1
- 5th International Conference on Self-Determination Theory, Rochester NY, U.S.A. (poster presentation)	2013		1
- Voorjaarscongres Nederlandse Vereniging voor Psychiatrie "Motivatie", Maastricht, the Netherlands (organisation of two symposia, two oral presentations at each of these symposia)	2014		2
- Third European Congress on Assertive Outreach – "reaching out together", Oslo, Norway (oral presentation)	2015		1
- Fifth European Conference on Schizophrenia Research, Berlin, Germany (oral presentation)	2015		1

Teaching	Year	Hours	ECTS
Tutoring			
- Tutoraat	2011	80	
- Cursus 'Omgaan met Groepen'	2011	4	
- Second year "keuzeonderwijs" for medical students	2011	40	
	2012	40	
	2013	40	
Supervising Master's theses of five students	2011 -2013		5

Publications

Jochems, E. C., Mulder, C. L., van Dam, A., & Duivenvoorden, H. J. (2011). **A critical analysis of the utility and compatibility of motivation theories in psychiatric treatment.** Current Psychiatry Reviews, 7(4), 298-312. doi:10.2174/157340011797928204

Jochems, E. C., Mulder, C. L., van Dam, A., Duivenvoorden, H. J., Scheffer, S. C., van der Spek, W., & van der Feltz-Cornelis, C. M. (2012). **Motivation and treatment engagement intervention trial (MotivaTe-IT): the effects of motivation feedback to clinicians on treatment engagement in patients with severe mental illness.** BMC Psychiatry, 12, 209. doi:10.1186/1471-244X-12-209

Kortrijk, H. E., Mulder, C. L., van Vliet, D., van Leeuwen, C., Jochems, E., & Staring, A. B. (2013). **Changes in Motivation for Treatment in Precontemplating Dually Diagnosed Patients Receiving Assertive Community Treatment.** Community Mental Health Journal. doi:10.1007/s10597-012-9582-2

Mulder, C. L., Jochems, E., & Kortrijk, H. E. (2014). **The motivation paradox: higher psychosocial problem levels in severely mentally ill patients are associated with less motivation for treatment**. Social Psychiatry and Psychiatric Epidemiology, 49(4), 541-548. doi:10.1007/s00127-013-0779-7

Jochems, E. C., Mulder, C. L., Duivenvoorden, H. J., van der Feltz-Cornelis, C. M., & van Dam, A. (2014). **Measures of Motivation for Psychiatric Treatment Based on Self-Determination Theory: Psychometric Properties in Dutch Psychiatric Outpatients**. Assessment, 21(4), 494-510. doi:10.1177/1073191113517928

Jochems, E. C., Van Dam, A., Duivenvoorden, H. J., Scheffer, S., Van der Feltz-Cornelis, C. M., & Mulder, C. L. (2015). **Different Perspectives of Clinicians and Patients with Severe Mental Illness on Motivation for Treatment**. Clinical Psychology and Psychotherapy. doi:10.1002/cpp.1971

Jochems, E. C., Van der Feltz-Cornelis, C. M., Van Dam, A., Duivenvoorden, H. J., & Mulder, C. L. (2015). **The effects of motivation feedback in patients with severe mental illness: a cluster randomized controlled trial. Neuropsychiatric Disease and Treatment,** 11, 3049-3064. doi:http://dx.doi.org/10.2147/NDT.S95190

Jochems, E. C., Duivenvoorden, H. J., van Dam, A., Van der Feltz-Cornelis, C. M., & Mulder, C. L. (2016). **Motivation, treatment engagement and psychosocial outcomes in outpatients with severe mental illness: A test of Self-Determination Theory.** (Revised and resubmitted).

Jochems, E. C., Duivenvoorden, H. J., Van Dam, A., Mulder, C. L., & Van der Feltz-Cornelis, C. M. (2016). **Testing the Integral Model of Treatment Motivation in outpatients with severe mental illness.** (Revised and resubmitted).

Jochems, E. C., Duivenvoorden, H. J., Van Dam, A., Van der Feltz-Cornelis, C. M., & Mulder, C. L. (2016). **The TransTheoretical Model Stages of Change for Motivation to Engage with Psychiatric Treatment in Outpatients with Severe Mental Illness.** (Submitted).

Measures and tools

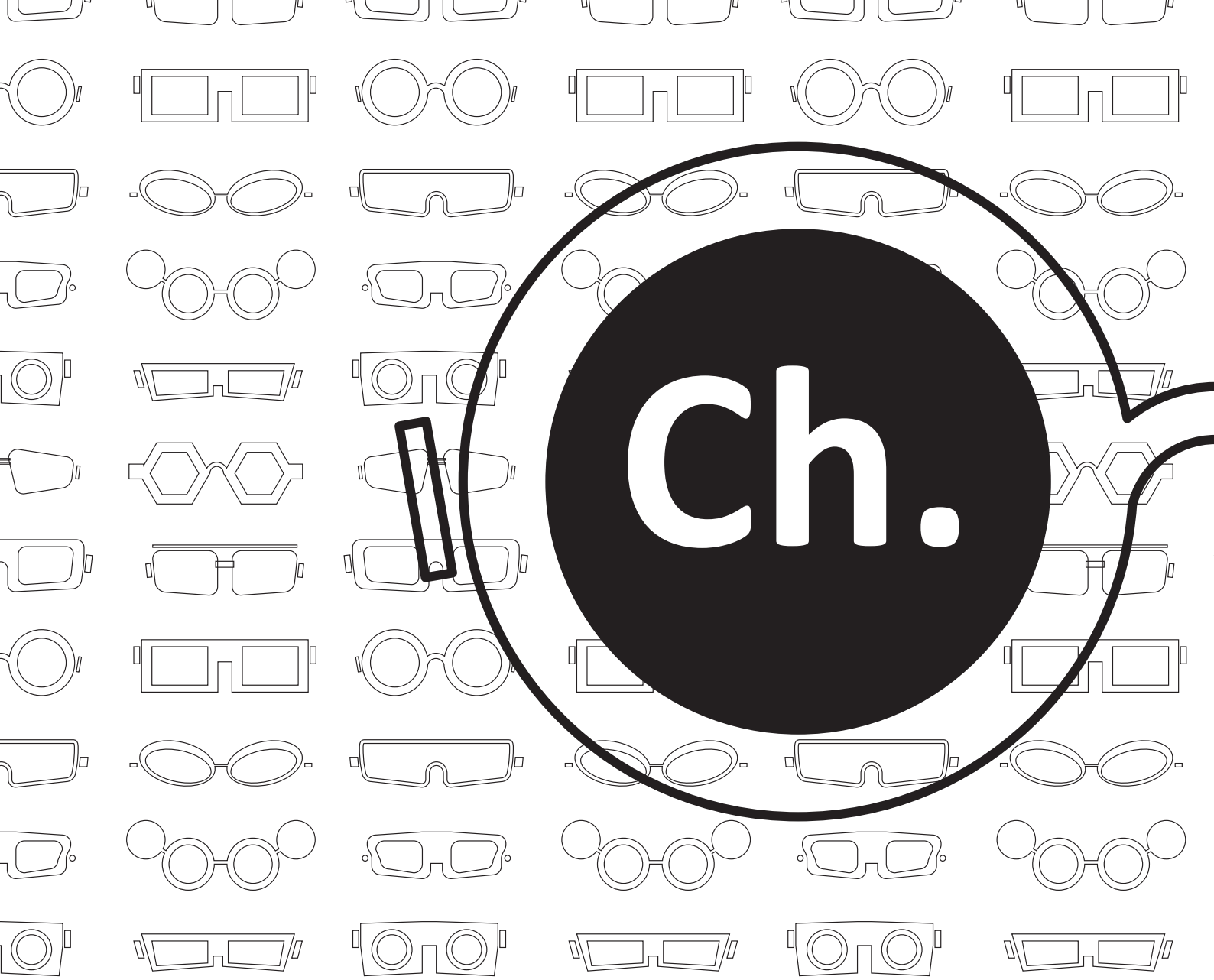
Jochems, E. C., Mulder, C. L., Duivenvoorden, H. J., van der Feltz-Cornelis, C. M., & van Dam, A. (2014). **Dutch version of the Treatment Entry Questionnaire (TEQ).**

Jochems, E. C., Mulder, C. L., Duivenvoorden, H. J., van der Feltz-Cornelis, C. M., & van Dam, A. (2014). **Dutch version of the Health Care Climate Questionnaire (HCCQ).**

Jochems, E. C., Mulder, C. L., Duivenvoorden, H. J., van der Feltz-Cornelis, C. M., & van Dam, A. (2014). **The Dutch Short Motivation Feedback List (SMFL).**

Jochems, E. C., Duivenvoorden, H. J., Van Dam, A., Mulder, C. L., & Van der Feltz-Cornelis, C. M. (2016). **Adaptation of the 'perceived legal pressure scale' from the Treatment Motivation Scales for Forensic outpatient treatment [116,118] to 'perceived external pressure'.**

Jochems, E. C., Duivenvoorden, H. J., Van Dam, A., Van der Feltz-Cornelis, C. M., & Mulder, C. L. (2016). **The Dutch Short Processes of Change scale (SPoC-Dutch).**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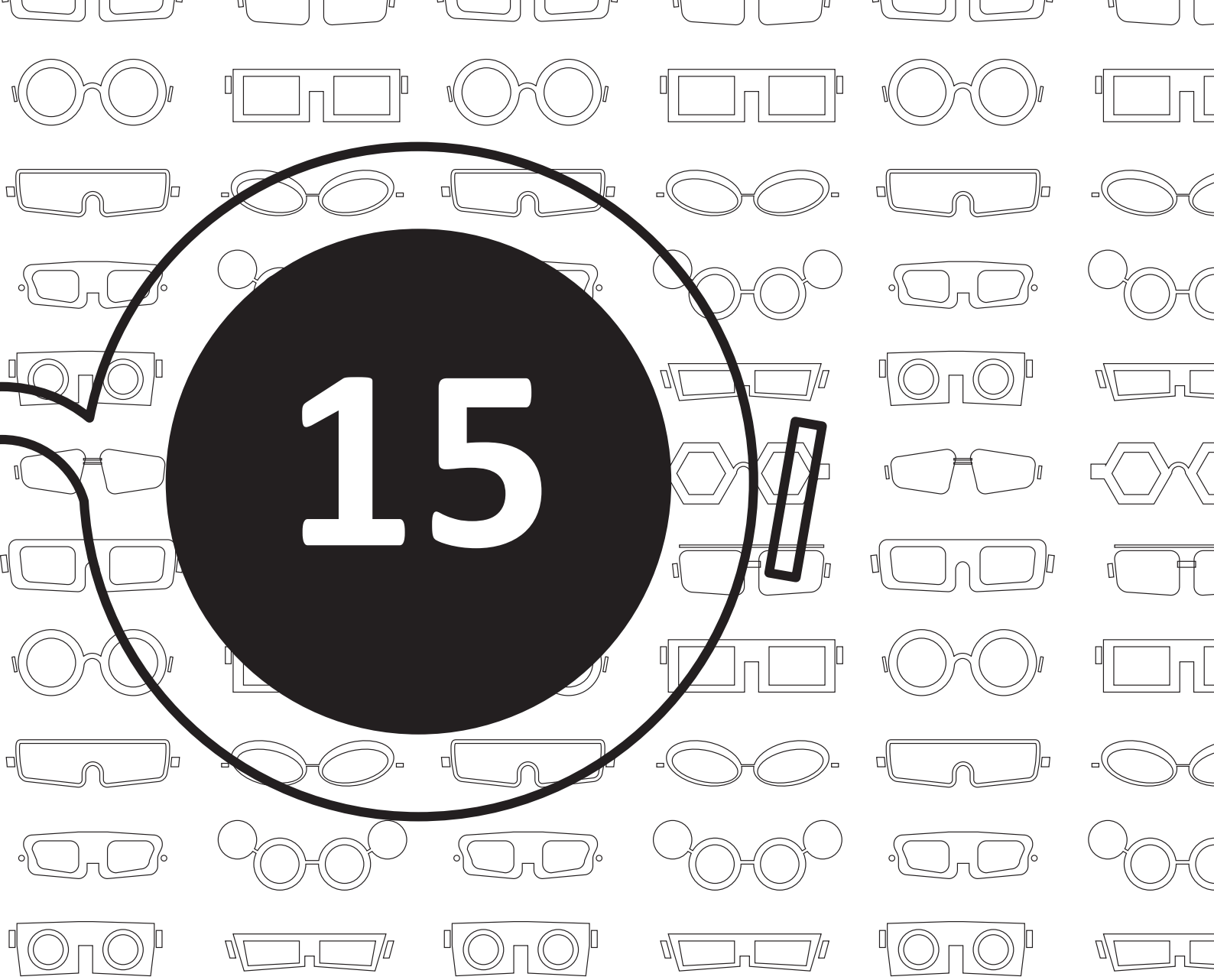

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Dankwoord

Dankwoord

Motivatie. Een woord met veel betekenissen, inmiddels ook met veel persoonlijke betekenis voor mij. Zonder de samenwerking en steun van veel inspirerende en motiverende mensen had dit project en dit proefschrift niet gerealiseerd kunnen worden. De afgelopen jaren heb ik me o.a. kunnen verheugen op het vooruitzicht om ooit dit stukje tekst te kunnen schrijven waarin ik mijn 'motivators' zou mogen bedanken voor hun bijdrage aan dit werk. Ik realiseer me dat ik met dit schrijven nooit iedereen voldoende recht kan doen en ik hoop daarom dat jullie weten dat mijn dankbaarheid verder gaat dan de woorden in deze tekst.

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Beste Arno, als co-promotor en als persoon wil ik je bedanken voor jouw inspirerende en optimistische aanwezigheid in dit project. Ik heb je leren kennen als iemand die denkt in kansen en oplossingen, iemand die beschouwend en rustig naar complexe zaken kan kijken en dat was in mijn ogen voor dit project en voor mijzelf zeer waardevol. Onze gesprekken over de motivatietheorieën en hoe deze in de praktijk vertaald konden worden, hebben mij steeds uitgedaagd om de zaken weer in een ander perspectief te zien. Ook de momenten tussendoor, bijvoorbeeld in de auto van Rotterdam naar Dordrecht, waarin we iets uitgebreider konden spreken over de andere - meer moeizame - processen waar elke promovendus mee te maken krijgt, hebben mij gerustgesteld en geholpen. Daarnaast hebben we ook gelachen, wat altijd een fijn medicijn is tegen teleurstellingen en tegenslagen!

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zeer persoonlijke inkijk die jullie mij gaven in jullie beleving van het contact met de hulpverlening heb ik bijzonder gewaardeerd. Ik heb gezien en geleerd van jullie dat kwetsbaarheid en kracht altijd samengaan en ik probeer dat nu uit te dragen in mijn werk als psycholoog. Bedankt voor alles!

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Van de teams van GGz Breburg: Tom van Mierlo, Rob Fitters, Ben Haagh, Daan van Baar, Hanjo van Berkel, Truus ter Braak, Jackelien Klerks, Marieta Verhoeven, Barbara Breugelmans, Petra Rops, Cees Santbergen, Marieke Arnoldus, Mandy van der Pluijm, Yerko Raams, Roland Hoven, Netty Nix, Tom Verrijp, Nico Appel, Ad de Leeuw, Marcel Verdonk, Willem van Hezewijk, Anton Mols, Lianne van Broekhoven, Jobke Debats, Suanne Bitter, Marianne Damen, Cecile van Glabbeek, Susan Reijrink, Jitske de Graaf, Els van Abeelen, Ron Maidman, Ton op 't Hoog, Petra Dalmaijer, Ad van der Made, Frank Baarends, Karin Kleinjan, Miriam van Woenzel en John Vije. Ook mensen wiens naam hier niet genoemd staan, maar die destijds in de teams werkzaam waren om voor mij de deur open te doen, een vraag te beantwoorden, een mailtje door te sturen of andere behulpzame acties tussendoor te doen; bedankt!

∞

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∞

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∞

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∞

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