PSYCHOLOGICAL MECHANISMS TO TREATMENT ADHERENCE AMONG PEOPLE
WITH SEVERE MENTAL ILLNESS: VALIDATING TREATMENT MOTIVATION AND
WORKING ALLIANCE MEASURES

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ABSTRACT

JOËLLE C. FERRON: PSYCHOLOGICAL MECHANISMS TO TREATMENT ADHERENCE AMONG PEOPLE WITH SEVERE MENTAL ILLNESS: VALIDATING TREATMENT MOTIVATION AND WORKING ALLIANCE MEASURES

(Under the direction of Kim Strom-Gottfried)

Working alliance and treatment motivation are important indicators for social work clinicians to assess in the course of their practice with individuals with severe mental illness. Measures of treatment motivation have yet to be validated for this population, and measures of working alliance need further confirmatory work. This study further evaluated the Treatment Motivation Questionnaire (TMQ) among people with severe mental illness and used confirmatory factor analysis to test the factor structure of the truncated Working Alliance Inventory short form (WAI- s) among people with severe mental illness and their clinicians. Furthermore, the predictive validity of the TMQ and WAI short form was tested by relating these psychological constructs to treatment adherence.

Results show that the TMQ had additional subscales of external motivation, which further supports Self Determination Theory. The truncated WAI short forms for clinicians and consumers were modestly supported, although a second-order confirmatory analysis was confirmed. Lastly, the WAI was minimally related to treatment adherence, and the TMQ was not predictive of treatment adherence.

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CHAPTER 1

INTRODUCTION

Empirical evidence shows that individuals with severe mental illness (SMI) experience better functioning and reduced symptoms if they follow recommended psychiatric treatment (Kampman & Lehtinen, 1999; Thornley & Adams, 1998). However, many consumers with SMI do not fully engage in their mental health services. For example, up to 75% of consumers with SMI fail to adhere to prescribed regimens of medications within two years of discharge from a hospital (Olfson et al., 2000; Perkins, 1999), leading to increased risk of relapse, suicide, violence, and arrest (Fenton & Mc Glashan, 1994; Steadman et al., 2001; Young, Spitz, Hillbrand, & Daneri, 1999). Studies have documented the economic burden of treatment nonadherence in SMI (Thieda, Beard, Richter, & Kane, 2003), and one study estimated the direct medical costs from nonadherence in psychotic disorders at $2.3 billion per year in the United States (Olfson et al., 2000).

Currently, there is limited understanding of the basic mechanisms underlying nonadherence in SMI (Fenton & Mc Glashan, 1994; Kampman & Lehtinen, 1999). Failure to adhere to treatment regimens in SMI may result from a number of factors, including: lack of social support (Olfson et al., 2000); substance-abuse co-morbidity (Heyscue, Levin, & Merrick, 1998; Olfson et al., 2000); difficulty affording treatment or obtaining

transportation (Nageotte, Sullivan, Duan, & Camp, 1997); medication-related factors, including unwanted side effects (Fenton & Mc Glashan, 1994; Lieberman et al., 2005; Naber & Kasper, 2000) and the way medicines are injested (Steadman et al., 2001); lack of insight into illness (Lieberman et al., 2005; Nageotte, Sullivan, Duan, & Camp, 1997); and greater psychiatric symptom severity (Adams & Scott, 2000a).

Although various studies have found social and biological barriers to treatment adherence, many of the research instruments used to assess adherence-related variables have not been adjusted or adapted for use in populations with severe mental illness, (SMI), and with the clinicians who treat them. For example, many measures are overly lengthy and use overly complicated language which increases measurement error due to the inattention and/or misunderstanding of research participants with SMI (Harris, Minassian, & Perry, 2007). However, brief and accurate scoreable measures could help clinicians undertake assessments during clinical sessions. Within the consumer/clinician dyad, there are some fundamental prerequisites that lead to successful treatment outcomes, such as adherence, the presence of shared goals, trust, and motivation (Corriss et al., 1999).

A few studies have shown that consumers who reported a stronger working alliance were more likely to comply with medication regimens and to remain in therapy (Frank & Gunderson, 1990; Neale & Rosenheck, 1995). One of the most frequently used scales to measure therapeutic alliance among people with SMI is the Working Alliance Inventory (WAI) (McAbe & Priebe, 2004). The WAI is grounded in Bordin's conceptualization of working alliance, which includes the trust between the consumer and clinician (bonds) and working together to obtain similar objectives (goals) (Horvath &

Greenberg, 1989). Although the WAI long-form has been validated within this population, the WAI short-form, a shorter and easier version of the WAI, needs further confirmatory scale development (Andrusyna, Tang, DeRubeis, & Luborsky, 2001). Also, due to the high correlation between the two factors (bond and goals), a second order CFA is needed to assess the fit of the overarching working alliance construct.

Whereas some previous studies have examined how the therapeutic relationship affects treatment adherence in medical patients, no research has systematically explored the relationship between treatment motivation and adherence among people with SMI. Research in other areas of behavioral medicine has consistently shown that "internalized motivation" is associated with greater treatment adherence, for example, in patients with diabetes, obesity, alcohol, and nicotine addiction (Ryan, Plant, & O'Malley, 1995; Williams & Deci, 2001; Williams, Grow, Freedman, Ryan, & Deci, 1996; Williams, McGregor, Zeldman, Freedman, & Deci, 2004; Williams, Rodin, Ryan, Grolnick, & Deci, 1998a, , 1998b). Furthermore, the psychometric properties of treatment motivation scales for people with severe mental illness are unknown.

The following studies aim to address these challenges, exploring the validity and reliability of two measures with utility for people with severe mental illness. A strong working alliance and consumer motivation to attend treatment are essential for positive outcomes. However, until instruments are validated to measure constructs such as motivation and trust in SMI populations, efforts to create a strong evidence on adherence outcomes will be hampered. Once the scales have been psychometrically assessed, the predictive validity of the scales can be tested in order to assess the links between psychological mechanisms and adherence in this population.

Research questions

First paper: A conceptually-based scale to measure consumers' motivation for attending mental health services

1) Does the Treatment Motivation Questionnaire (TMQ) maintain the previously tested factor structure when applied to persons with severe and persistent mental illness?

2) Are the factors internally reliable?

Second paper: Confirming the factor structure of the Working Alliance Inventory among consumers with severe mental illness and their clinicians.

1) Does the shortened form of the Working Alliance Inventory (WAI) for clinicians and consumers maintain the factor structures found in previous research?

2) If so, do the two subscales of the WAI support a second order factor structure?

3) What is the internal reliability of the WAI for case managers and consumers?

Third paper: Predicting psychosocial treatment attendance: The effects of working alliance and treatment motivation on increased adherence.

1) Does working alliance and treatment motivation have the ability to predict attendance of clinical meetings (predictive validity of the WAI – Short form and TMQ)?

2) What factors are the strongest predictors of treatment adherence?

CHAPTER 2

THE INTERNAL RELIABILITY AND FACTOR STRUCTURE OF THE TREATMENT MOTIVATION QUESTIONNAIRE AMONG PEOPLE WITH SEVERE MENTAL ILLNESS

Treatment motivation is an informative construct that is often included in studies of why consumers comply – or fail to comply – with prescribed therapies for various chronic diseases. Specifically, research has shown consistently that "internalized motivation" is related to greater treatment adherence in people with diabetes, persons in a weight loss program, alcohol treatment, and smoking cessation (Ryan, Plant, & O'Malley, 1995; Williams & Deci, 2001; Williams, Grow, Freedman, Ryan, & Deci, 1996; Williams, McGregor, Zeldman, Freedman, & Deci, 2004; Williams, Rodin, Ryan, Grolnick, & Deci, 1998a, , 1998b). A strong evidence base shows that individuals with severe mental illness (SMI) experience better functioning and reduced symptoms if they follow recommended psychiatric treatment (Kampman & Lehtinen, 1999; Thornley & Adams, 1998). However, many consumers with SMI do not fully engage in their mental health services. For example, up to 75% of consumers with SMI fail to adhere to prescribed regimens of medications within two years of discharge from a hospital (Olfson et al., 2000; Perkins, 1999), leading to increased risk of relapse, suicide, violence, and arrest (Fenton & Mc Glashan, 1994; Steadman et al., 2001; Young, Spitz, Hillbrand, & Daneri, 1999). However, valid and reliable instruments to measure treatment motivation in this

population have been lacking. This study develops and tests such a measure by adapting the Treatment Motivation Questionnaire (TMQ) (Ryan, Plant, & O'Malley, 1995).

Understanding and measuring the components of treatment motivation in people with severe mental illness are complicated by the features of their psychopathology as well as the kinds of interventions they tend to receive. For example, "negative" psychotic symptoms – such as amotivation, flat affect, alogia, and social isolation – are often conflated with lack of internalized motivation to attend treatment. Similarly in patients with major mood disorders, depressive symptoms can interfere with internalized motivation. People with disabling psychiatric disorders may also be subjected to external motivating forces, such as involuntary hospitalization, forced administration of medication, and various kinds of "leverage" from the legal and social-welfare systems designed to improve their adherence with recommended treatment in the community (Monahan et al., 2005). Experiences with these kinds of interventions may influence measurement of the domain of external treatment motivation.

Numerous studies have examined motivation in people with mental disorders using Prochaska and DiClementes' "stages of change" theory (Carey, Purnine, Maisto, & Carey, 1999). However, these studies are somewhat limited by their unidimensional focus on the construct of change without examining discrete dimensions of motivation. Self-determination theory (SDT) (Deci, 1995) may offer a more useful framework for understanding and measuring treatment motivation in people with SMI. Self-determination theory (SDT) is a general theory of human motivation that focuses on the extent to which behaviors are volitional – performed by an internally-regulated, subjectively-embraced choice over alternatives – rather than being manipulated or coerced by external factors that

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the person does not control. In the area of health behaviors, empirical research in SDT has

demonstrated consistently that these factors are associated with greater adherence, for

example, better glucose control for patients with diabetes (Williams, Freedman, & Deci,

1998; Williams, McGregor, Zeldman, Freedman, & Deci, 2004), maintenance with smoking

cessation (Williams & Deci, 2001), alcohol treatment adherence (Ryan, Plant, & O'Malley,

1995), and long-term maintenance with weight loss interventions (Williams, Grow,

Freedman, Ryan, & Deci, 1996). However, there are no previous SDT-based measures of

treatment motivation that have been validated for populations with severe mental illness. In

this study, we develop and test such a measure using an adapted version of the original TMQ,

which Ryan and Deci (1985) based explicitly on the conceptual framework of SDT.

According to the Organistic Integration Theory (OIT), a sub-theory of SDT, intrinsic

or internal and extrinsic or external motivations exist on a continuum. Indeed, OIT postulates

that externally-motivated behavior can become increasingly integrated into intrinsically-

motivated behavior over time. In Figure 2.1, the OIT continuum is illustrated. The four

subtypes of external motivation, termed *external regulators*, are illustrated. The least self-

determined regulator is termed *external regulation*, which characterizes behavior that is

performed only to fulfill an external demand or environmental contingency (Ryan & Deci,

2002). The second-most restrictive regulator is termed *introjected regulation*. This form of

regulation is partially internalized and manifests itself in "should statements." People

performing behaviors motivated by introjection do so to avoid feelings of guilt and shame.

The third *external regulator* is termed *regulation through identification*. This form of

regulation occurs when a person believes in the importance of the behavior in the context of

their identity. I*ntegrated regulation* occurs when a person performs behavior that is in

concordance with their goals, values, and identity, but does not enjoy the task or engage in the task for the sense of enjoyment, the characteristics that separate this extrinsic regulator from intrinsic motivation. Finally, intrinsic motivation involves engaging in a behavior for the inherent satisfaction found in the act.

The Treatment Motivation Questionnaire-Revised (TMQ) is a 25-item scale that was originally designed to measure dimensions of a person's motivation to enter and remain in treatment for alcohol dependence; this includes regulators of motivation and other constructs from SDT (Ryan, Plant, & O'Malley, 1995). Specifically, the original TMQ included four domains based on SDT: confidence in treatment, help-seeking behaviors, and internal and external motivation. These domains were confirmed using principal component analysis.

Figure 2.1: **Self-Determination Continuum Showing Types of Motivation with their Regulatory Styles, Loci Of Causality, and Corresponding Processes (Ryan & Deci, 2002)**

Not Self- Determined ← → Self- Determined

Extrinsic Motivation

Intrinsic Motivation

External Regulation

Introjected Regulation

Identified Regulation

Integrated Regulation

Intrinsic Regulation

Perceived Locus Of Causality	External	Somewhat External	Somewhat External	Internal	Internal
Relevant Regulatory Processes	Compliance, External Rewards and Punishments	Self-control, Ego-Involvement, Internal Rewards And Punishments	Personal Importance, Conscious Valuing	Congruence, Awareness, Synthesis With Self	Interest, Enjoyment, Inherent Satisfaction

Ryan and colleagues' research on the original TMQ produced some limited evidence of the reliability and validity of this measure. Assessment of internal reliability found Cronbach's alphas ranging from .70 to .98. Test-retest reliability confirmed that the simple structure found from the first principal component analysis remained the same over time. Construct validity was assessed through the relationship between motivation, patient involvement, and retention in treatment. The researchers found that greater internal motivation related with increased patient involvement and retention for adults with alcohol abuse and dependence (Ryan, Plant, & O'Malley, 1995). The measure has not been validated across other treatment populations.

The current study examines the validity and reliability of the TMQ for people with severe mental illness. We conduct an exploratory factor analysis (EFA) in order to closely examine the underlying structure of treatment motivation in this population. After obtaining the results of the EFA, we conduct a confirmatory factor analysis (CFA) on these results. We address two central questions: 1) Does TMQ exhibit a similar factor structure to the original TMQ? 2) Does the instrument provide a valid and reliable measure of treatment motivation in people with SMI?

Method

Sample selection

Data for this study come from the baseline interview of a sample enrolled in a

randomized study of the effectiveness of psychiatric advance directives (J. W. Swanson et

al., 2006b). The study's sample criteria included: (1) age 18-65; (2) chart diagnosis of

schizophrenia, schizoaffective disorder, other psychotic disorder, or major mood disorder

with psychotic features; (3) currently receiving community-based treatment provided through

one of two county-based programs in the north-central region of North Carolina; and (4) able

to give informed consent to the study.

Approximately 500 patients from two county-based public mental health systems in

the north-central region of North Carolina were approached for enrollment in the study. The

sample was stratified to obtain approximately 20% of participants following an acute

inpatient admission; this improved the study's generalizability to SMI patient populations

(See Swanson et al, 2006).

Screening, informed consent, and recruitment.

Treating clinicians verified that identified patients met study criteria and sought

patient permission to be contacted by a researcher. Patients willing to be contacted were

approached by a research interviewer. The study protocol was approved by the Duke

University Medical Center Institutional Review Board (IRB) and by the IRBs of the

participating programs and hospital.

Measures

The original Treatment Motivation Questionnaire developed by Ryan and Deci

(1985) was adapted for the SMI population. A total of 25 items were included in the new

survey. Most items remained the same or were slightly changed. For example, the item, "It

will be a relief for me to share my concerns with other program participants" was revised to

read, "It will be a relief for me to share my concerns with others in treatment."

The TMQ response categories comprise a seven-point Likert scale, ranging from 1

(*not at all true*) to 7 (*very true*). Table 2.1 presents the mean, standard deviation, skewness

and kurtosis of each item. As shown in the table, most of the items do not have skewness

values near to or equal to three. Also, the kurtosis values indicate non-zero values. Thus,

none of the items were normally distributed. To compensate for the non-normal distributions

of the items in the psychometric analyses, the data were transformed using standard

corrective techniques (see statistical analysis).

Table 2.1: Item Descriptions of Central Tendency

Items	n	Mean	SD	Skewness	Kurtosis
I came for treatment at the clinic because:					
1. My family/friend said I should get some help	464	3.31	2.56	0.44	-1.57
2. I want to make changes in my life	464	5.95	1.79	-1.79	2.07
3. My doctor/therapist told me I should be in treatment	463	4.88	2.37	-0.66	-1.17
4. I won't feel good about myself if I don't get help	462	5.37	2.13	-1.09	-0.23
5. I feel so guilty that I have to do something	462	4.13	2.54	-0.13	-1.69
If I remain in treatment, it will be because:					
6. I'll get in trouble if I don't	463	3.72	2.56	0.12	-1.72
7. I'll feel very bad about myself if I don't.	463	4.56	2.41	-0.45	-1.41
8. I'll feel like a failure if I don't.	462	3.95	2.56	-0.02	-1.72
9. I think it's the best way to help myself	465	6.24	1.53	-2.37	4.87
10. I don't really feel like I have a choice	464	4.09	2.6	-0.12	-1.74
How true is each statement to you.					
11. I was under pressure to come	464	3.2	2.49	0.52	-1.45
12. I am not sure this treatment will work	459	2.5	2.03	1.03	-0.38
13. I am interested in getting help	465	6.23	1.5	-2.36	5.01
14. I am not sure this treatment will help with my concerns and difficulties	462	2.7	2.15	0.89	-0.72
15. I wanted to openly relate to others	460	5.37	2.1	-1.11	-0.15
16. I want to share some of my concerns and feelings with others	463	5.43	2.05	-1.13	-0.06

17. Important to work closely with others to solve my problems	463	5.52	1.96	-1.24	0.31
18. I am responsible for this type of treatment	460	5.93	1.76	-1.79	2.12
19. I doubt that this treatment will solve my problems	461	2.38	1.98	1.25	0.18
20. I look forward to relating to others with similar problems	459	5.37	2.09	-1.08	-0.21
21. I chose this treatment because I think it's an opportunity for change	460	5.94	1.76	-1.85	2.39
22. I am not very confident that I will get results from treatment this time	458	2.32	1.96	1.32	0.38
23. It will be a relief for me to share my concerns with others in treatment	456	5.23	2.13	-0.95	-0.48
24. I accept the fact that I need some help and support from others	463	5.91	1.78	-1.79	2.10
25. I am not confident treatment will work for me	462	2.23	1.75	1.47	1.23

Statistical Analyses

First, the subsample of individuals completing the entire TMQ was compared to the original sample through chisquare and t-tests statistics. Factor solutions were generated using exploratory factor analysis (EFA) with the principal factoring solution subtype, the minimal residual method (MINRES procedure in LISREL). The minimal residual method relaxes typical EFA assumptions about the continuous nature of the items and the latent construct through the use of full information maximum likelihood estimators (Joreskog & Moustaki, 2006). Two solutions were explored: the first selected variables based on eigenvalues (greater than one) (Gorsuch, 1983) and the second assumed the original four factors specified by Ryan and Deci (1985). Within these factor structures, items that accounted for less than 35% of the variance on a specific factor were incrementally excluded from the analyses (Gorsuch, 1983).

Although, the literature has shown that classic test theory methods such as confirmatory factor analysis confound bias with true mean differences, item response theory

(IRT) was not used in this analysis because a non-SMI comparison sample was not available (Embretson & Reise, 2000).

Due to the uncertain validity of the construct, competing factor structures were tested through confirmatory factor analysis (CFA). First, due to the non-normal distributions of the variables, the seven point Likert response scale was treated as an ordinal scale. Polychoric correlations and asymptotic covariances were obtained in PRELIS. Then, a Diagonal Weighted Least Squares estimator employed the asymptotic covariance matrix and polychoric correlation in order to obtain CFA parameters (Weighted Least Squares methods require large sample sizes for complex models) (Kline, 2005). A confirmatory factor analysis on the TMQ beginning with a common factor model was performed using LISREL (version 8.54) and subsequent non-significant pathways were eliminated, producing two solutions. Listwise deletion was used to handle missing observations, reducing the total sample from 469 to 422. Cronbach's alpha values were used to measure reliability of ordinal variables. Non-nested models were tested separately with the Root Mean Squared Error of Approximation (RMSEA) and Satorra-Bentler chisquares and then comparatively with Akaike's Information Criterion (AIC).

Results

Sample

Due to listwise deletion, the sample was reduced from 469 to 422 participants. For a more comprehensive description of the entire sample, see the original Psychiatric Advanced Directive intervention paper (J. W. Swanson et al., 2006a).

There was no difference in mean participant age between the original sample ($M = 42$ years, $SD = 10.7$ years) and the TMQ sample ($M = 42.2$ years, $SD = 10.7$ years), $t(889) =$

0.28, $p = .78$ (two-tailed), $d = .72$. There was also no difference between the number of males (40%) and females (60%) in the samples $X^2(1, N = 889) = 0.003$, p >.05. Likewise, there were no differences between racial group compositions $X^2(1, N = 862) = 0.002$, p >.05 with African Americans comprising about 58% of the sample and Caucasians comprising 39% of the sample. Forty-six percent of both samples reported never having been married, again showing no differences between samples $X^2(1, N = 891) = 0.007$, p >.05.

Regarding clinical diagnosis, there were also no differences between the original sample and the subsample for the TMQ due to listwise deletion $X^2(1, N = 886) = 0.12$, p >.05. In the TMQ sample, about 58% of participants had a chart diagnosis of schizophrenia or a schizophrenia spectrum disorder, 28% were diagnosed with bipolar disorder, and 13% were diagnosed with depression with psychotic features. Psychiatric symptoms were measured with the Brief Psychiatric Rating Scale (BPRS). There was no significant difference between the entire sample and the TMQ sub-sample ($M = 33$, $SD = 9.2$), $t(889) = 0.65$, $p = .52$ (two-tailed), $d = .62$. In relation to functioning in everyday life, in the TMQ sub-sample, the mean score on the Global Assessment of Functioning (GAF) scale was 40.0, with a standard deviation of 10.03, consistent with moderate functional impairment. There was no difference on GAF scores between the sub-sample and the original sample ($M = 40$, $SD = 10.03$), $t(889) = .00$, $p = 1.00$ (two-tailed), $d = .68$.

The sample is different from the original sample used by Ryan and Deci (1985), which was comprised of individuals in alcohol treatment who were not diagnosed with a major mental disorder.

Exploratory Factor Analyses

Exploratory factor analyses revealed two solutions. However, the substantive meaning of one of those factors differs from the original TMQ. The original TMQ had only one external motivation domain. In the four-factor solution, introjected regulation (a sub-type of external motivation) came to the forefront. (Discussion of the meaning of the factors is described in greater detail below.)

In the four-factor solution shown in Table 2.2, an oblique rotation was used, due to the a-priori assumption of related subscales. This solution with promax rotation shows a nearly-simple structure. However, the third item, "I feel so guilty that I have to do something" loads significantly on the Introjected and Intrinsic Motivation subscales – the former a positive and the latter a negative loading. Additionally, in order to obtain this solution, several items were eliminated. The questions, "I am looking forward to getting some social support," "Others will be angry with me if I don't," "I don't feel like I have a choice about staying in treatment," and "I wouldn't be here if I really had a choice" did not significantly load on factors in either the four- or five-factor solution (factor loadings were below .35). However, the four-factor solution also does not include the items, "My family/friends said I should get some help," "My doctor/therapist said I should get some help," and "I'll get in trouble if I don't stay in treatment." These items become part of the introjected and extrinsic motivation in the five-factor model.

Table 2.2: Exploratory Factor Analysis with Four Factor Solution

Items **I came for treatment at the clinic because:**	Introjected Regulation	Intrinsic Motivation	Lack of Confidence	Relatedness	H^2
I want to make changes in my life	0.27	**0.40**	0.00	0.10	0.65
I won't feel good about myself if I don't get help	**0.74**	0.19	0.09	-0.04	0.38
I feel so guilty that I have to do	*0.73*	*-0.37*	-0.16	0.05	0.50

something

If I remain in treatment, it will be because:

I'll feel very bad about myself if I don't.	**0.85**	0.16	-0.11	-0.15	0.29
I'll feel like a failure if I don't.	**0.82**	0.15	0.06	-0.13	0.32
I think it's the best way to help myself	0.20	**0.68**	-0.11	0.03	0.33

How true is each statement to you.

I was under pressure to come	**0.36**	-0.41	0.13	0.23	0.69
I am not sure this treatment will work	0.07	-0.22	**0.58**	0.02	0.50
I am interested in getting help	-0.02	**0.84**	0.03	0.03	0.30
I am not sure this treatment will help with my concerns and difficulties	0.05	0.01	**0.77**	0	0.41
I wanted to openly relate to others	0.01	-0.02	0.04	**0.83**	0.33
I want to share some of my concerns and feelings with others	-0.12	0.07	0.04	**0.88**	0.24
Important to work closely with others to solve my problems	-0.04	0.13	-0.05	**0.74**	0.33
I am responsible for this type of treatment	-0.01	**0.70**	0.05	0.06	0.50
I doubt that this treatment will solve my problems	-0.06	0.07	**0.85**	-0.07	0.31
I look forward to relating to others with similar problems	-0.08	0.06	0.01	**0.81**	0.33
I chose this treatment because I think it's an opportunity for change	0.01	**0.58**	-0.09	0.26	0.36
I am not very confident that I will get results from treatment this time	-0.02	0.01	**0.93**	0.04	0.17
It will be a relief for me to share my concerns with others in treatment	-0.07	-0.05	-0.09	**0.90**	0.21
I accept the fact that I need some help and support from others	0.15	0.32	0	**0.39**	0.53
I am not confident treatment will work for me	-0.12	-0.19	**0.52**	-0.20	0.44

As seen in Table 2.3, significant communality scores (H^2) of items in the introjected motivation subscale explain from 29 to 69 percent of the total variance of the model. Additionally, factor weights in boldface type indicate significant loading values. Indeed, items on the intrinsic subscale contribute from 30 to 65 percent of the total variance. The

communalities on the lack of confidence and relatedness subscales have ranges from 0.17 to
0.50 and 0.21 to 0.53, respectively. This indicates that the items on the lack of confidence in
treatment sub-scale do not consistently account for variance.

Table 2.3: Exploratory Factor Analysis with a Five Factor Solution

Items	External Regulation	Introjected Regulation	Intrinsic Motivation	Lack of Confidence	Relatedness	H^2
I came for treatment at the clinic because:						
1a. My family/friend said I should get some help	**0.56**	-0.08	0.03	0.02	-0.01	0.74
1b. I want to make changes in my life	0.24	0.02	**0.71**	-0.05	-0.08	0.5
1c. My doctor/therapist told me I should be in treatment	**0.64**	-0.11	0.36	0	-0.06	0.58
I won't feel good about myself if I don't get help	*0.25*	*0.34*	*0.31*	*0.07*	*0.06*	0.52
I feel so guilty that I have to do something	0.16	**0.61**	0.26	-0.10	-0.01	0.39
If I remain in treatment, it will be because:						
I'll get in trouble if I don't	0.24	**0.60**	-0.31	0.15	0.02	0.50
I'll feel very bad about myself if I don't.	-0.11	**0.94**	0.07	0.08	-0.07	0.19
I'll feel like a failure if I don't.	-0.05	**0.85**	0.11	-0.10	-0.06	0.28
I think it's the best way to help myself	-0.07	0.20	**0.66**	0.11	0.06	0.33
I don't really feel like I have a choice	*0.34*	*0.33*	*-0.23*	*-0.09*	*0.16*	0.59
How true is each statement to you.						
I was under pressure to come	**0.62**	0.02	-0.22	-0.06	0.06	0.51
I am not sure this treatment will work	0.06	0.06	-0.18	**-0.59**	0.01	0.50
I am interested in getting help	-0.02	-0.05	**0.82**	0.01	0.04	0.31
I am not sure this treatment will help with my concerns and difficulties	0.04	0.03	0.01	**-0.77**	0.02	0.41
I wanted to openly relate to others	0.11	-0.03	0.02	-0.05	**0.80**	0.34
I want to share some of my concerns and feelings with others	0.03	-0.12	0.08	-0.05	**0.86**	0.25
Important to work closely with others to solve my problems	-0.03	0	0.1	0.03	**0.76**	0.32

I am responsible for this type of treatment	-0.21	0.08	**0.53**	-0.02	0.19	0.54
I doubt that this treatment will solve my problems	0.04	-0.06	0.10	**-0.85**	-0.07	0.30
I look forward to relating to others with similar problems	0.03	-0.06	0.06	-0.02	**0.81**	0.33
I chose this treatment because I think it's an opportunity for change	-0.04	-0.02	**0.57**	0.10	0.27	0.36
I am not very confident that I will get results from treatment this time	0.02	0.01	-0.02	**-0.92**	0.07	0.17
It will be a relief for me to share my concerns with others in treatment	0.00	-0.03	-0.09	0.08	**0.92**	0.20
I accept the fact that I need some help and support from others	-0.16	0.26	0.2	-0.03	**0.49**	0.50
I am not confident treatment will work for me	-0.17	0.00	-0.20	**-0.58**	-0.16	0.40

The five-factor solution found that the original extrinsic motivation subscale became divided into two forms of extrinsic regulation, namely, *introjected regulation* (also found in the four-factor model) and *extrinsic regulation* that includes pressure from friends/family and doctors/therapists to attend treatment. This additional division of the old extrinsic motivation domain provides new and substantive explanatory power. More discussion of the subscales' naming and meaning will be provided in subsequent sections.

As seen in Table 2.3, the five-factor solution has simple structure. Items that were excluded from the model are shown in italicized and bold print indicating low factor loadings across subscales. Additionally, the rotation methods provided in MINRES of promax and varimax both produce a solution with one negatively loaded factor. The rotational issue will not affect the CFA model, but questions about the validity of this subscale within this measurement model should be tested.

Similar communality values are shown in the five-factor model. The addition of external motivation illustrates that these three items account for 51 to 74 percent of the total

explained variance of the model. In Table 2.3, the factor loadings in bold represent significant values.

Near Simple Solution

The results of the confirmatory factor analysis produced two near-simple solutions. As shown in Appendix I, polychoric correlations were produced in order to perform these analyses (they are illustrated here for replication purposes). Table 2.1 can be used as a reference for the numbers used to represent items in Appendix I. In both the four and five factor models, analysis began with a common factor model and non-significant factor weights were eliminated from each model in order to produce near simple solutions.

The four-factor model had conflicting results. Firstly, the Satorra-Bentler Chi-Square was significant (X^2=327.69, df=160, p=.0000), indicating a notable difference between the data and the model specified. However, the model had excellent Comparative Fit Index (CFI) and Goodness of Fit Index (GFI) scores of 0.99 and 0.98, respectively. The RMSEA was adequate at 0.05 with a 90 percent confidence interval of (0.042- 0.057). Additionally, there were only 18 standardized residuals (out of 200) greater than 2.58 (about 9%). Thus, the overall fit statistics for four-factor near-congeneric model indicate a poor fit.

In the five-factor model, the model fit was excellent overall. The Satorra-Bentler Scaled chi-square test was non-significant, indicating no significant differences between the model and the data (X^2=223.43, df=218, p=.39). The model had excellent Comparative Fit Index (CFI) and Goodness of Fit Index (GFI) scores of 0.96 and 0.97 respectively. The overall Root Mean Square Error of Approximation (RMSEA) was .008 with a 90%confident interval from (.0-.022), which also indicates an excellent fit for the model. Additionally, there were only 33 standardized residuals (out of 264) that were greater than 2.58 (about 12.5%).

Thus, the overall fit statistics for the five-factor near-congeneric model indicate an excellent fit.

Because the models are not nested (due to the cross-loadings of the items on different factors), the Akaike's Information Criterion (AIC) was used to aid in the comparison of the models (smaller is better). The AIC for the four-factor model is equal to 462.55, and the AIC for the five-factor model is equal to 339.43. These results indicate that the five-factor model fits the data better.

Table 2.4 illustrates the factor loadings, standard errors, and squared multiple correlation values for each item in the five-factor near-congeneric model. As shown in Table 2.4, all items loaded positively and significantly on their corresponding factors. It should be noted that the analyses of the 25 items of the TMQ are data driven and thus exploratory in nature. Nevertheless, these analyses provide compelling evidence that the five-factor structure best explains the observed relationships between the 25 TMQ items.

Table 2.4: Five Factor Model Confirmatory Model

Items	External Regulation Regression Coefficient (standard error)	Intrinsic Regulation Regression Coefficient (standard error)	Lack of Confidence Regression Coefficient (standard error)	Introjected Motivation Regression Coefficient (standard error)	Relatedness Regression Coefficient (standard error)	R^2
I came for treatment at the clinic because:						
My family/friend said I should get some help	0.98 (0.23)					0.22
I want to make changes in my life		0.74 (0.04)				0.32
My doctor/therapist told me I should be in treatment	1					0.23
I won't feel good about myself if I don't get help				0.95 (0.06)		0.68
If I remain in treatment, it will be because:						
I'll get in trouble if I don't	0.97 (0.26)			0.29 (0.08)		0.4
I'll feel very bad about				1		0.76

Item						R^2
myself if I don't.						
I'll feel like a failure if I don't.				0.97 (0.06)		0.71
I think it's the best way to help myself		1.08 (0.04)				0.68

How true is each statement to you.

Item						R^2
I was under pressure to come	1.23 (0.4)					0.35
I am not sure this treatment will work			0.93 (0.04)			0.53
I am interested in getting help		1				0.59
I am not sure this treatment will help with my concerns and difficulties			0.86 (0.04)			0.45
I wanted to openly relate to others					0.88 (0.03)	0.6
I want to share some of my concerns and feelings with others					0.97 (0.04)	0.73
Important to work closely with others to solve my problems					1.00 (0.03)	0.77
I am responsible for this type of treatment		0.89 (0.04)				0.46
I doubt that this treatment will solve my problems			1.00 (0.03)			0.6
I look forward to relating to others with similar problems					0.94 (0.03)	0.68
I chose this treatment because I think it's an opportunity for change		1.1 (0.05)				0.71
I am not very confident that I will get results from treatment this time			1			0.6
It will be a relief for me to share my concerns with others in treatment					1	0.77
I accept the fact that I need some help and support from others		0.47 (0.08)			0.42 (0.09)	0.44
I am not confident treatment will work for me			1.09 (0.04)			0.72

Reliability of the TMQ Subscales

The overall reliability of the TMQ subscales is adequate. The lowest reliability coefficient is for the subscale of *external regulation*, which has an unacceptable standardized Cronbach's alpha (α=0.51). The subscales for *intrinsic motivation* (α=0.78), *lack of confidence in treatment* (α=0.82), *introjected regulation* (α=0.73), and *relatedness motivation* (α=0.87) had subscales reliability scores within a respectable range of values (DeVellis, 2003).

Substantive Meaning of Factors

Due to the exploratory nature of the analysis, the factors differ somewhat from the original TMQ scale, particularly in the addition of the *introjected motivation* subscale. The additional factor is a result of a sub-factor of the original external motivation domain. Beyond the statistical criteria for the five factor model, the additional factor, *introjected motivation*, is a composite of items characterized by guilt and "should" statements. *Introjects* have been described as external or group values that the individual has not fully recognized, embraced, or integrated into the self (Deci, 1995). Items such as, "I'll feel like a failure if I don't. . ." are laden with feelings of guilt and negative affect. Avoiding feelings of shame and guilt are the primary motivators in this domain. Theory in this area suggests that beyond avoiding negative affect, following introjected motivation enhances ego functioning. Thus, *introjected regulations* (or motivations) can reduce self-esteem (Ryan & Deci, 2002).

The *introjected regulation* items differ from the *external regulation* items by the type of statement and the source of the motivation. *External motivators* are reinforced by a source outside of the individual. Items such as, "My friend/family told me I should be in treatment" indicates motivation deriving from an outside source, whereas the *introjected motivation* is an internal voice derived from an external place. The other *external motivation* items are:

"My family/friends told me I should get some help" and "I was under pressure to come." However, one of the items of this scale is also loaded on the introjected domain. The item, "I'll get in trouble if I don't" loads on both the *introjected* and *external motivation scales*. In this case, the item's wording does not clarify whether getting in trouble is a real external motivator, a perceived external motivator, or introjected motivation.

The three other subscales are similar to Deci and Ryans' original scale. *Lack of confidence (LOC) in treatment* is another subscale, which is characterized by a consumers' non-belief or ambivalence in treatment. An example of a LOC item is, "I am not sure this treatment will help with my concerns and difficulties" Individuals with high scores in this area have concern and doubt about the treatment they are receiving.

Relatedness or interpersonal help seeking behaviors is another subscale from the original TMQ. This subscale is characterized by statements that illustrate the importance of communication with fellow consumers or patients during the treatment process. Statements such as, "It is important to work closely with others to solve my problems" are characteristic of this domain.

Lastly, *intrinsic or internal motivation* is a subscale defined as, "engaging in an activity for the pleasure and satisfaction inherent in that activity" (Ryan & Deci, 2002). The items of this subscale are much like the original subscale. They are characterized by items such as, "I remain in treatment because I think it's the best way to help myself." Items in this domain illustrate the individual's internalized motivation and drive for therapeutic treatment.

Discussion

The original scale by Ryan and Deci (1985) was only partially confirmed. However, revisiting the TMQ lends further support for the current conceptual framework of self-determination theory (SDT) and organismic integration theory (OIT). Specifically, external motivation is an overarching construct that comprises several sub-dimensions or regulators of emotion: external, introjected, indentified, and integrated. The CFA of the TMQ substantiates two of these four regulatory sub-dimensions -- external and introjected motivation. Importantly, these results indicate that different types of external motivators are at work in motivating treatment participation by people with severe and persistent mental illness. Due to the largely coercive nature of many treatment modalities for this population, the TMQ may be helpful in assessing externally motivating sub-dimensions. However, future work should develop more questions relating to the sub-dimensions of identified and integrated motivation.

In addition to adding sub-dimensional items and factors to fit all of the external motivation categories in SDT, two items that loaded on two sub-scales need confirmatory validation or rewording. The item, "I'll get in trouble if I don't," is significantly related to external motivation and introjected motivation. This dual loading indicates an ambiguous question that could indicate being punished by an external source or feeling the fear that the person may get into trouble. Wording of this item could be improved by making it more specific to the situation, for example, "The mental health center will refuse to help me if I don't." Likewise, the item, "I accept the fact that I need some help and support from others" loaded on instrinsic motivation and relatedness subscales. This is a double- barreled question that could be further separated into, "I accept the fact that I need some help," which appears to be an intrinsic motivation item, and "I accept the fact that I need some support," which

appears to be a relatedness item. These findings illustrate the additional need to confirm this factor pattern while testing some new questions in order to strengthen the TMQ.

Although the testing of the TMQ was not definitive, the methods employed in this study were more accurate than previous research in verifying the measurement structure of this instrument, specifically, by compensated for non-normally distributed data with an asymptotic covariance structure and polychoric correlation. Additionally, the confirmatory factor analysis method produced an overall fit statistic for assessing the strength of the model. Although these methods were partially data driven, the substantive meanings behind the factors demonstrate construct validity in the TMQ. Additionally, the Cronbach's alpha statistic used to measure internal consistency may not be as robust with ordinal data. However, currently there are no measurements in the field that measure internal consistency for ordinal data, particularly with the assumption that measurement points within the scale may not have equal distances from each other.

The primary limitations of the current scale development is that replication of the current findings are needed before the scale can be reliably used within the SMI population. Firstly, additional items need to be generated for the external motivation subscale. Secondly, confirmatory factor analysis needs to be performed in order to further validate the scale and test whether or not a congeneric solution can be obtained. In addition, the predictive validity of the scale should be tested in order to replicate studies in parallel areas of research that have found intrinsic motivation to be a predictor of medication adherence.

Further, future research on the TMQ should assess the instrument's time-invariant properties. The time variable is relevant to this population because persons with chronic illnesses may need sustained internal motivation to remain in treatment over time. In

contrast, other behaviors may require internal motivation at the beginning of treatment, but less so over time. In addition to time invariance, group invariance would also be an important property to test. Further work should be done to examine the differences across diagnoses. This could contribute to clinical assessment, for example, in better distinguishing between the lack of intrinsic treatment motivation per se and the negative symptoms of schizophrenia.

Clinical Implications

The current analysis confirms the applicability of the SDT conceptual framework for understanding treatment participation (or lack of participation) among people with severe mental illness. Although the literature on treatment adherence among SMI individuals often highlights the role of coercion and external motivators, little has been done to explore the different types of external regulators or motivations that may actually drive or inhibit treatment engagement in this population. Knowing more about the specific types of motivation that support long-term treatment adherence in these individuals would help unpack treatment resistance for clinicians and aid clinicians in their efforts to engage patients in beneficial therapies over time.

CHAPTER 3

A CONFIRMATORY FACTOR ANALYSIS OF THE WORKING ALLIANCE INVENTORY
SHORT FORM AMONG PEOPLE WITH SEVERE MENTAL ILLNESS AND THEIR
CLINICIANS

The current mental health care system relies heavily on case management services for

people with severe mental illness (SMI). The working alliance between case managers and

service users is an essential factor in successfully providing treatment and resources (Hopkins &

Ramsundar, 2006). Although the importance of working alliance as a concept was first

highlighted by Freud in the context of psychoanalysis, researchers have struggled to define and

create 'theory free' constructs to measure working alliance. One such construct is the Working

Alliance Inventory (WAI) created by Horvath and Greenberg (1989) based on Bordin's (1979)

definition of working alliance. Bordin (1979) defined working alliance as the shared goals, tasks,

and bond experienced by the consumer and therapist within the treatment relationship.

In general, working alliance has been consistently related to numerous positive therapy

outcomes across treatment and theoretical approaches (Horvath & Greenberg, 1989; Martin,

Garske, & Davis, 2000). Moreover, different theoretical clinical approaches have not been

shown to have significantly different effect sizes (Ahn & Wampold, 2001; Stiles, Shapiro, &

Elliott, 1986); because of this finding, researchers are turning to process related variables across

clinical and theoretical approaches in order to find predictors of positive outcomes. For example,

findings from the national study on depression suggest that working alliance has a significant positive effect on therapy and pharmacotherapy (Krupnick et al., 1996). Other studies have found that working alliance is related to positive outcomes across differing clinical populations, such as people with alcohol problems (Dearing, Barrick, Dermen, & Walitzer, 2005), partner violent men (Taft, Murphy, Musser, & Remington, 2004), and older adults (Hyer, Kramer, & Sohnle, 2004).

Specific to the treatment of individuals with SMI, studies across treatment types report increased working alliance related to positive outcomes. For example, one study found that a greater working alliance between inpatient staff and consumers related to less time in the hospital (Johansson & Eklund, 2006). Similarly, studies in rehabilitation treatment for individuals with SMI found that a greater working alliance related to better consistency in consumers' work and better overall goal attainment within therapy (Gehrs & Goering, 1994; Lieberman et al., 2005; O'Donnell et al., 2003). Also, in outpatient therapy, studies found that a greater working alliance related to better treatment attendance, completion of homework, a decrease in symptom severity, better global functioning, and increased community living skills (Dunn, Morrison, & Bentall, 2006; Neale & Rosenheck, 1995; Pyszczynski, Greenberg, & Solomon, 2000).

Due to the significance of the working alliance across therapies, there has been substantial research that supports the reliability and validity of numerous measures of working alliance (Fenton & Mc Glashan, 1994). The present study focused on the Working Alliance Inventory (WAI), which was developed from Bordin's tripartite model. The WAI offers a construct that can be used across therapies and disciplines (Howgego, Yellowlees, Owen, Meldrum, & Dark, 2003). Extensive psychometric research has been performed to substantiate the reliability and validity of the WAI in the original long form (Hanson, Curry, & Bandalos,

2002; Horvath & Greenberg, 1989; Tracey & Kokotovic, 1989), and more recently, research on reliability and validity of the WAI short form supports the interchangability of the long and short forms (Busseri & Tyler, 2003; Hatcher & Gillaspy, 2006). Overall, the WAI inventory has proven reliable and valid in the general psychotherapy population. However, there is a dearth of research on the WAI within people with SMI.

A few studies have explored the psychometric properties of the WAI for people with SMI (Bale, Catty, Watt, Greenwood, & Burns, 2006; Gehrs & Goering, 1994; Goldberg, Rollins, & McNary, 2004). Within these studies, Bale et al (2006) reviewed the construct validity of the WAI long form through use of the Helping Alliance Questionnaire (HAQ), which was created for use within people with SMI. They found that the consumer versions of HAQ and WAI were highly correlated, but that the WAI clinician form was weakly correlated with both the consumer scales (Bale, Catty, Watt, Greenwood, & Burns, 2006). In contrast, another study of the WAI long form found the WAI consumer and therapist version to be highly correlated (Gehrs & Goering, 1994). Considering the contradictory findings of these studies, it is likely that some of the findings are affected by sample selection bias or other factors that are not measured. The final study aimed to test the reliability and internal consistency of the WAI short form within people with SMI (Goldberg, Rollins, & McNary, 2004). This study found fair to moderate test-retest reliability and internal consistency. They also found weaker correlations between working alliance scores for consumers and clinicians and attributed this difference to distinctly different perceptions of the relationship within the therapeutic dyad. The shortcomings of this study are that they had a small sample size (n= 64) and did not perform a factor analysis. On the whole, some preliminary measurement diagnostics on the WAI short form have appeared in the

literature, however, more psychometric studies are needed in order to confirm and support the structure of this instrument for people with SMI.

The primary aim of the current study is to test the factor structure of the WAI short form for individuals with SMI and their case managers or primary therapists. If the Working Alliance Inventory (WAI) short form maintains the factor structure found in previous research, do the two subscales of the WAI support a second order factor structure? What is the internal reliability of the WAI short form for case managers and consumers? Is there agreement between the case managers' and consumers' views of the working alliance? Does this relationship depend on the duration of the therapeutic relationship?

Method

Sample selection

Data for this study come from the baseline interview of a sample enrolled in a randomized study of the effectiveness of psychiatric advance directives (J. W. Swanson et al., 2006b). As described in Chapter II, the study's sample criteria included: age 18-65; chart diagnosis of schizophrenia, schizoaffective disorder, other psychotic disorder, or major mood disorder with psychotic features; currently receiving community-based treatment provided through one of two county-based programs in the north-central region of North Carolina; and able to give informed consent to the study.

Treating clinicians verified that identified patients met study criteria and sought patient permission to be contacted by a researcher. Patients willing to be contacted were approached by a research interviewer.

Consumer Characteristics.

The mean participant age was 42 years (standard deviation=10.7 years). The sample was predominantly female (60%) and African American (58%). Thirty-nine percent of the sample was white, and 3% were from other racial backgrounds. Forty-six percent reported never having been married. Thirty-four percent of the sample had a high school education or equivalent. At the time of enrollment, 55% of participants were living in their own home or apartment.

Regarding clinical diagnosis, 59% of participants had a chart diagnosis of schizophrenia or a schizophrenia spectrum disorder, 27% were diagnosed with bipolar disorder, and 14% were diagnosed with depression with psychotic features. Approximately 49% had reported some symptoms or complaints of a substance use disorder. Psychiatric symptoms were measured with the Brief Psychiatric Rating Scale (BPRS) and the mean score on the BPRS was 33.6, with a standard deviation of 9.2, indicating a moderate level of symptomatology. In relation to functioning in everyday life, the mean score on the Global Assessment of Functioning (GAF) scale was 40.0, with a standard deviation of 10.3, consistent with moderate functional impairment.

Regarding mental health services utilization, 72% of participants reported at least one outpatient visit during the month prior to baseline, while 35% had been hospitalized for psychiatric disorder in the previous six months.

Coercive treatment experiences were commonly reported: Sixty-eight percent of participants reported lifetime experiences of involuntary intervention surrounding a past hospitalization, such as being handcuffed by police for transport to the hospital, receiving forced medication, or being subjected to physical restraints and seclusion. However, hospitalization was not uniformly viewed as an unwanted event; 38% of the sample reported experiences in

which they felt the need to be hospitalized, but were not admitted. For a more comprehensive

description of this sample, see the original Psychiatric Advanced Directive intervention paper (J.

W. Swanson et al., 2006a).

Forty-eight percent of the sample reported past experiences of leveraged community

treatment (outpatient commitment, criminal justice sanctions, money, or housing conditioned on

outpatient treatment participation); 24% were currently under one or more of these types of

leverages.

Clinician Characteristics.

Of the clinician sample, clinicians were on average slightly over 40 years old (41.3, S.D.

13.74), and over a quarter of the clinicians were male (26.9 percent). Nearly half the clinicians

were white (46.2 percent), with the majority of the remainder black/African-American (44.9

percent). Less than half of the sample had a bachelor's degree or less (42.3 percent). Slightly

over 15% of the sample had a master's in social work (19.74 percent) and about 10% reported

having some other master's degree (9.73 percent). Nearly 20% of the sample had a nursing

degree (19.46 percent). Clinicians were on average quite experienced, reporting over 11 years of

mental health services experience (12.0, S.D. 8.78). Their reported caseload size was large, with

an average of 73.7 (S.D. 94.66). It should be noted, however, that the range of caseload size

varied dramatically, from a low of 7 to a high of 450. Due to listwise deletion, the clinician

sample was reduced by 2 participants lowering the number of clinicians from 79 to 77.

Measures

Working Alliance Inventory (WAI).

Working alliance was assessed with the short form of the Working Alliance Inventory (WAI) adapted for use with SMI individuals and their mental health clinicians (Horvath & Greenberg, 1989; Neale & Rosenheck, 1995). Both the consumer and clinician forms of the WAI measure two domains. The WAI measures the degree to which the therapist and consumer perceive a bond and shared goals in their working relationship. The two scales for therapist and consumer share parallel forms. For example, under the shared goal subscale, the consumer is asked to rate the statement, "My clinician perceives accurately what my goals are;" the clinician is asked to rate the statement, "The client and I have a common perception of his/her goals." The WAI response categories comprise a five-point Likert scale, ranging from 1 (*strongly agree*) to 5 (*strongly disagree*).

Analysis Plan

Of the 469 consumers and 79 clinicians interviewed, all of the consumers completed the WAI, but not all of the clinicians for those consumers could be interviewed. Due to this, only 361 clinician responses were used in this analysis (77 clinician responses), but the total 469 sample of consumers was used.

The Working Alliance Inventory short forms for case managers and consumers were analyzed using confirmatory factor analysis (CFA) with the factor structure specified in the original study (Horvath & Greenberg, 1989). A CFA requires normal distribution of the scale items (Bollen, 1989; Gorsuch, 1983; Kline, 2005). Due to the non-normal distributions of the variables, the Likert response scale were treated as an ordinal scale and polychoric correlations and asymptotic covariances were obtained in PRELIS in order to account for the ordinal scale assumptions. The ordinal response assumptions also required the use of a robust estimator, so the Diagonal Weighted Least Squares method were used to estimate CFA parameters (Kline, 2005).

A confirmatory factor analysis was performed using the LISREL program (version 8.54) and the factor structure was based on previous solutions confirmed with other populations (Horvath & Greenberg, 1989). Listwise deletion was used to handle missing observations. Model fit was evaluated with Root Mean Squared Error of Approximation (RMSEA) and Satorra-Bentler chisquares along with other fit indexes. Then, a higher order factor analysis was performed on the subscales of bond and shared goals for the consumer and clinician WAI measures in order to test the validity of the larger construct of working alliance.

Cronbach's alpha values were used to measure reliability of the factors within the consumer and case manager version of the scale. Further, correlations between the case manager and consumer factors were performed after stratifying the dyads by the median time of their working relationship. This was done in order to assess the influence of relational time on the perception of working alliance.

Results

Distributions of WAI-short form items

The distributions of the observed responses for both the WAI short forms are presented in Table 3.1. Bollen (1989) notes that tests of normality are essential to detecting violations of the generalized estimators used in confirmatory factor analysis. Specifically, when measures of skewness and kurtosis are not equal to 0 and 3, respectively, using the data with maximum likelihood estimators may produce erroneous results. As illustrated in Table 3.1, skewness values range from somewhat close to zero (0.62) to over one point away from zero (1.27), which displays positive skewness. Additionally, the kurtosis values range from -0.15 to 2.07 indicating

that the distributions have much thinner tails than a normal distribution. Correlation matrices for

the WAI consumer and clinician are located in Appendices II and III.

Table 3.1: Distributions of *Working Alliance Inventory - Short Form* items
Working Alliance Inventory - Short Form

Items		Consumer					Clinician			
	n	Mean	SD	Skewness	Kurtosis	n	Mean	SD	Skewness	Kurtosis
Have a common perception of the client's goals.	469	2.04	1.02	0.93	0.30	378	2.14	0.88	1.08	1.26
The current goals of the work are important to client.	469	1.83	0.87	1.27	2.07	375	3.93	0.89	-1.06	1.15
Have established a good understanding of the kinds of changes that would be good for client.	469	2.07	0.98	0.85	0.33	378	2.21	0.87	0.78	0.40
Are working toward mutually agreed upon goals.	469	2.06	0.94	0.87	0.47	377	2.11	0.84	0.97	1.08
Feel confident in clinician's ability to help client.	469	1.92	0.92	1.08	1.08	381	4.09	0.71	-0.70	0.90
The relationship is important to the client.	469	1.94	0.90	0.98	0.87	371	2.11	0.86	0.85	0.85
The client has trust in clinician.	469	2.05	0.95	0.86	0.52	368	1.98	0.73	0.88	2.07
Have established a strong working alliance and rapport.	469	1.97	0.98	1.17	1.31	374	2.21	0.95	0.62	-0.15

First order factor structure.

The CFA results indicated that the consumer model had an adequate fit ($SBX^2(19)$ = 41.60, p =.002; CFI = 1.00; GFI = 1.00; RMSEA (90% C. I.) = 0.05 (0.029 - 0.071); RMR = 0.024; SBX^2/df = 2.19). As shown in Table 3.2, all factor loadings were statistically significant and support previous factor structures. Further, the two consumer WAI factors had a high positive correlation (r=.82, p<.01), indicating a second order factor analysis may fit the data.

The CFA results indicated that the clinician model had an adequate fit ($SBX^2(19)$ = 32.22, p = .03; CFI = 1.00; GFI = 1.00; RMSEA (90% C. I.) = 0.04 (0.004 - 0.09); RMR = 0.042; SBX^2/df = 1.70). As shown in Table 3.2, all factor loadings were statistically significant. Further, the two consumer WAI factors had a high positive correlation (r=.69, p<.01), indicating a second order factor analysis may fit the data.

Table 3.2: Confirmatory Factor Analysis Results of the WAI- short form
   Working Alliance Inventory Short Form

Items	Consumer			Clinician		
	Goal	Bond	R squared	Goal	Bond	R squared
	Regression Coefficient (standard error)	Regression Coefficient (standard error)		Regression Coefficient (standard error)	Regression Coefficient (standard error)	
Have a common perception of the goals.	0.97 (0.04)		0.71	0.96 (0.06)		0.75
The current goals of the work are important	1.00 (0.04)		0.75	0.69 (0.08)		0.39
Have established a good understanding of the kinds of changes that would be good	1.02 (0.03)		0.78	1.00		0.81
Are working toward mutually agreed upon goals.	1.00		0.76	0.99 (0.05)		0.8
Feel confident in ability to help client.		1.05 (0.03)	0.87		0.82 (0.04)	0.57
The relationship is important		1.02 (0.03)	0.81		0.95 (0.03)	0.77
The client has trust in clinician.		1.00	0.78		1.00	0.85

Have established a strong working alliance and rapport.		1.02 (0.03)	0.82		1.02 (0.03)	0.89

Second order factor structure.

Results of the second order CFA of the consumer WAI indicate an excellent fit of the model (SBX^2(18) = 25.86, *p* = .10; CFI = 1.00; RMSEA (90% C. I.) = 0.03 (0.0 - 0.06); RMR = 0.024; SBX^2/df = 1.44). Likewise, the results of the clinician CFA produce an excellent fit (SBX^2(18) = 20.72, *p* = .29;CFI = 1.00; RMSEA (90% C. I.) = 0.02 (0.0 - 0.05); RMR = 0.042; SBX^2/df = 1.15).

Internal reliability.

The internal reliability (Cronbach's alpha) of the consumer version of the Goal subscale was .89 and the Bond subscale was .92, both indicating a high degree of internal reliability. The total scale score was .94, which indicates a high degree of internal consistency but also that the scale items may be redundant (DeVellis, 2003). Additionally, the internal reliability (Cronbach's alpha) of the clinician Goal subscale was .85 and the Bond subscale was .87, indicating that both had excellent internal reliability. Further supporting the good internal reliability, the total score alpha was .91.

Congruence.

The congruence between clinician and consumer ratings of working alliance for the entire sample on the Goal subscale was negligibly correlated, *r*(n=376)= .24, p<.01, and the Bond subscale was also negligibly correlated, *r*(n=381)= .27, p<.01. When the sample was divided at the median duration of the working alliance (m = 12 months), the consumer and clinician Goal subscales correlation increased to a low degree of correlation *r*(n=181) =.36, p<.01, for working relationships longer than one year and no correlation for relationships

shorter than one year, r(n=190) =.18, p<.01,. Similarly, the Bond subscales were minimally correlated in relationships older than one year, r(n=181) =.39, p<.01, and had a negligible correlation for relationships lasting under one year, r(n=195) =.19, p<.01.

Discussion

In this study, the WAI - Short form was tested within a sample with SMI and their clinicians. Our overall finding provides moderate support for the original factor structure and strong support for a higher-order model for this population. The excellent model fit for both consumer and clinician second-order structure indicates that the two subscales of Bond and Goals in the working alliance relate to the larger construct of working alliance; thus, summing the subscales to create a total score is appropriate.

Further, psychometric analyses indicate that the Goal and Bond subscales for both the consumer and the clinician had excellent internal reliability. Indeed, the internal reliability of the total score of the consumer version illustrate that the items may be redundant and that item reduction may help add to the parsimony of this scale. Internal reliability results were similar to results found in the original WAI-S research performed with another population (Hatcher & Gillaspy, 2006).

The correlations or lack of correlations between the consumer and clinician version of the WAI have been interpreted by some as a threat to the construct validity of the scale. On the contrary, the results of this study indicate that the congruence of consumer and clinician scores on working alliance are related to other factors, particularly the length of time the dyad has worked together. There could be several other mediators and moderators affecting the working relationship. For example, the consumers' relational capacity or blunted affect may inhibit their ability to relate to a clinician; likewise, a clinician may lack

emotional expression, fail to convey commitment to the success of the working relationship, or have a large caseload that does not facilitate close working relationships with consumers.

Limitations

This study is limited in several ways. The current study aims to confirm the factor structures of the original WAI – Short form base in Bordin's tripartite theory, however, one of the subscales – the task subscale – was omitted from the study. The task subscale is composed of items like, "My therapist and I agree about the things I will need to do in therapy to help improve my situation." Also, the nesting of the clinician subscale was not accounted for in this study (the nesting of consumers within clinician, i.e. clinicians reporting for numerous consumers may create a restricted range of variance and thus may produce smaller standard errors). Although this subscale was excluded from the current study, other published factor analyses of this scale indicate a one-factor solution, suggesting that the working alliance subscales are not conceptually different from one another (i.e. the subscales may be redundant) (Hatcher & Barends, 1996; Salvio, Beutler, Wood, & Engle, 1992).

Conclusions

In summary, the confirmatory factor analyses and psychometric testing of the consumer and clinician WAI short form produced several key findings. First, the factor structure of the original version was only moderately supported, whereas a second order structure was supported. Second, the internal reliability of the scales and subscales was very high, which further supports the use of the subscales and the total score within these populations. Finally, this study illustrates that the construct of working alliance for consumers and clinicians is not necessarily correlated if the duration of the working alliance does not support the time for alliance to develop. Overall, the WAI short form proves to be a

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reliable and brief scale that could easily be administered by clinicians in order to better

monitor their practices.

CHAPTER 4

PREDICTING PSYCHOSOCIAL TREATMENT ATTENDANCE AND
ADHERENCE: THE USE OF WORKING ALLIANCE AND TREATMENT MOTIVATIONS
AS MECHANISMS TO INCREASED ADHERENCE

Treatment attendance and medication adherence among people with severe mental illness

(SMI) has been shown to improve clinical outcomes, such as psychosocial functioning and

reduced psychiatric symptoms (Kampman & Lehtinen, 1999). Unfortunately, up to 75% of

consumers with SMI fail to adhere to prescribed regimens of medications within two years of

discharge from a hospital (Olfson et al., 2000; Perkins, 1999) leading to increased risk of relapse,

suicide, violence, and arrest (Fenton & Mc Glashan, 1994; Steadman et al., 2001; Young, Spitz,

Hillbrand, & Daneri, 1999). Studies have documented the economic burden of treatment

nonadherence in SMI (Thieda, Beard, Richter, & Kane, 2003), with one estimate indicating that

direct medical costs resulting from nonadherence in psychotic disorders are approximately $2.3

billion per year (Olfson et al., 2000). Yet, there is currently limited understanding of the

psychological mechanisms underlying treatment attendance and adherence among people with

SMI: Treatment motivation and working alliance could be key factors associated with

persistence in psychosocial treatment and taking prescribed psychiatric medications.

Testing the Predictive Validity of the WAI and TMQ

In other medical populations, treatment motivation, specifically intrinsic motivation has

been predictive of adherence to medicines (Ryan, Plant, & O'Malley, 1995; Williams & Deci,

2001; Williams, Grow, Freedman, Ryan, & Deci, 1996; Williams, McGregor, Zeldman,

Freedman, & Deci, 2004; Williams, Rodin, Ryan, Grolnick, & Deci, 1998a, , 1998b). To date, there have been no studies looking at the predictive validity of the TMQ among people with severe mental illness. Similarly, there is a dearth of evidence illustrating the predictive validity of the WAI – Short form, even though one study found that a greater working alliance related to better treatment attendance (Dunn, Morrison, & Bentall, 2006; Neale & Rosenheck, 1995; Pyszczynski, Greenberg, & Solomon, 2000). Thus, the current study aims to test the ability of the WAI - Short form and the TMQ to predict treatment adherence among people with SMI.

Treatment Adherence: What is it and why is it an important outcome?

The majority of research on treatment adherence in SMI focuses on adherence to medication regimens specified by psychiatrists (Zygmunt, Olfson, Boyer, & Mechanic, 2002). Even though there are numerous interventions aimed at increasing motivation to adhere to

treatment (Zygmunt, Olfson, Boyer, & Mechanic, 2002), lack of motivation to take medication is still very high. The lack of adherence to medication in SMI ranges from 26 to 58 percent (Cramer & Rosenheck, 1998). Studies have found that lack of medication adherence or motivation leads to at-risk behaviors such as violence, drug and alcohol abuse, and an increase in hospitalization, i.e., the revolving-door problem (Olfson et al., 2000; Swartz et al., 1998a; Swartz et al., 1998b)**.** Due to the high rates of medication non-adherence among people with SMI, many intervention strategies focus primarily on medication compliance as an outcome (Adams & Scott, 2000b; Cramer & Rosenheck, 1998; Zygmunt, Olfson, Boyer, & Mechanic, 2002). However, the term *treatment adherence* does not only refer to maintaining a psychotropic medication regimen, but also to participating in the array of mental health services available to people with SMI.

Most clinicians recognize the importance of providing psychosocial treatment in conjunction with psychiatric medications (Lenroot, Bustillo, Lauriello, & Keith, 2003). Indeed, medication adherence alone does not guarantee a lessening of symptoms and improvement in quality of life. One study has shown that even among individuals adhering to treatment, relapse rates within one year of inpatient discharge were as high as 14 to 40 percent (Lenroot, Bustillo, Lauriello, & Keith, 2003). Consumers' with medication adherence often continue to have symptoms and cognitive deficits even while they are taking medications (Liberman, 1994). Psychosocial treatments can aid consumers to manage these difficult symptoms and side-effects. Although there are biological and mental health system barriers to care, this paper will focus on the psychological mechanisms that lead to adherence to medications and psychosocial appointments.

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Psychological Mechanisms

   Working alliance.

Within psychosocial therapy, lack of treatment adherence can result from a poor working alliance with the therapist. Studies have found that adequate working alliances increase the consumers' adherence because they feel that their treatment needs are understood and that they have some input into their treatment (Nageotte, Sullivan, Duan, & Camp, 1997; Olfson et al., 2000; Osterberg & Blaschke, 2005).

   Treatment motivation.

The psychological mechanism of treatment motivation, defined in this paper as the reasons an individual stays in psychosocial treatment or continues to take medications (often termed treatment adherence), has limited research among people with SMI. Indeed, the *2003 President's New Freedom Commission Report on Mental Health* calls for an increase in psychosocial approaches which "enhance motivation and address psychiatric stabilization, skills acquisition, and relapse prevention" (Ziedonis et al., 2005). Although there has been recent clinical research in this area, specifically, the adaptation of motivational interviewing to increase consumers' adherence to psychiatric medication, there has been no evidence of the psychological mechanisms that could produce this change (Ogedegbe et al., 2007; A. J. Swanson, Pantalon, & Cohen, 1999). The current literature on treatment attendance and adherence has served as a behavioral proxy for treatment motivation under the assumption that people need motivation to attend and adhere to treatment. However, unless and until the research helps explain why an individual engages in treatment or what motivates an individual to engage in treatment, researchers and clinicians will be left with interventions

and behavioral outcomes without any knowledge of the motivational changes, (i.e. the psychological mechanism of change).

External rewards effect intrinsically motivated behaviors.

In a ground-breaking study on the effects of external rewards on intrinsically motivated behavior, Deci found that college students who were not given external rewards to work on a puzzle worked on the task longer than those given external rewards, in this case money (Deci, 1971). In a meta-analysis of studies replicating Deci's original findings, more than 125 articles were reviewed on the external reward of intrinsically motivated behaviors. The review found that external rewards undermine intrinsic motivation (Deci, Koestner, & Ryan, 1999). Indeed the meta-analysis found that engagement, completion, and performance contingencies undermined intrinsic motivation and the individual's self-report of interest in the task at hand in both children and adults (Deci, Koestner, & Ryan, 1999).

Unfortunately, how well SDT fits with SMI is largely unknown. Although some of the symptoms of the SMI spectrum of illnesses may prevent or diminish motivation to engage in enjoyable behaviors, the SDT findings of lessened intrinsic motivation due to external motivators may shed light on the efficacy of coercive treatments for people with SMI. The current study involves a naturalistic exploration of the relationship between treatment motivation and working alliance on adherence outcomes. Specifically, do the *Working Alliance Inventory* (WAI) and the *Treatment Motivation Questionnaire* (TMQ) have the ability to predict attendance of clinical meetings and medication adherence? If so, does the clinicians' number of years of clinical experience moderate consumers' intrinsic motivation to attend mental health treatment?

Method

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Sample selection. Data for this study come from the baseline and six month interview of a sample enrolled in a randomized study of the effectiveness of psychiatric advance directives (J. W. Swanson et al., 2006b). See Chapters II and III for further information on selection criteria.

Screening, informed consent, and recruitment. Treating clinicians verified that identified patients met study criteria and sought patient permission to be contacted by a researcher. Patients willing to be contacted were approached by a research interviewer.

Measures

Treatment Motivation Questionnaire (TMQ).

The original *Treatment Motivation Questionnaire* (TMQ) developed by Ryan and Deci (1985) was derived from Self-Determination Theory in order to measure treatment motivation. In the current research, the TMQ was adapted for the SMI population. A total of 25 items were included in the new survey. Most items remained the same or were slightly changed. For example, the item, "It will be a relief for me to share my concerns with other program participants" was revised to read, "It will be a relief for me to share my concerns with others in treatment." The TMQ response categories comprise a seven-point Likert scale, ranging from 1 (*not at all true*) to 7 (*very true*). The TMQ was administered at both the baseline and six month interview.

Working Alliance Inventory (WAI).

Working alliance was assessed with the short form of the Working Alliance Inventory (WAI) adapted for use with SMI individuals and their mental health clinicians (Horvath & Greenberg, 1989; Neale & Rosenheck, 1995). Both the consumer and clinician forms of the WAI measure two domains. The WAI measures the degree to which the therapist and

consumer assess the bond and shared goals in their working relationship. The two scales for therapist and consumer share parallel forms. For example, under the shared goal subscale, the consumer is asked to rate the statement, "My clinician perceives accurately what my goals are;" the clinician is asked to rate the statement, "The client and I have a common perception of his/her goals." The WAI response categories comprise a five-point Likert scale, ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Both versions of the scale were administered at baseline and six months.

Treatment Adherence Composite.

The treatment adherence variable is a composite variable based on the experiences of the clinician and consumer dyad at the six month interview of the study. Each clinician was asked if the consumer he or she treats has had an appointment in the past six months; if the clinician answered affirmatively, he or she was asked about the consumer's frequency of missed appointments. The Likert scale metric for this variable ranged from 1 (*never missed appointments*) to 5 (*avoided all appointments*). Likewise, the clinicians were also asked whether or not the consumers were being prescribed medicine and whether it was taken regularly, the Likert response scale ranged from 1 (*never missed medications*) to 6 (*never took medications*). The clinicians' reports at six months were then compared with the consumers' views of these same variables. Due to the binomial distributions of the adherence and attendance variables, the variables were collapsed. That is, if the consumer and clinician were in agreement about the client having never missed an appointment and never having missed medications, than the adherence variable was scored as a one. However, if either the consumer or case manager rated the attendance or adherence as otherwise, then the attendance variable was scored as zero.

Sample

> *Consumer Characteristics.*

> See consumer sample description from Chapter III.

> *Clinician Characteristics.*

> See clinician sample description from Chapter III.

Data Analysis

Hierarchical logistic modeling (HLM) controlled for the consumers nested within clinicians by modeling the clinician variable as a random effect using an unstructured covariance structure (Raudenbush & Bryk, 2002). HLM analysis occurred in three steps. First, bivariates were used to test whether or not the consumer and clinician level covariates from baseline and the six month interview predict treatment adherence at six months individually. Second, domain models were run in order to reduce potential redundancies and collinearity between variables. Lastly, variables that were significant in domain models were combined in order to produce a final model. Additionally, because the sample is from a study on the treatment effects of a psychiatric advanced directive (PAD), which had significant turnover in clinicians, the following analyses will control for PADs and change in clinician between the baseline and six month interview in the final model.

Results

Overall, 19% of consumers and clinicians were in agreement that the consumer was attendant to meetings and adherent to medications at the six month interview of the study. Of

the adherent consumers, 79.45% were diagnosed with a schizophrenia spectrum disorder, about 18% with Bipolar disorder (17.81%), and only 3% percent with major depression with psychotic features (2.74%).

Unconditional Model

The estimated intercept in the unconditional HLM analysis that included only the random effects in the model is 0.27. Because this HLM model includes only random effects, this is the log of the odds of a consumer adhering to mental health care in a typical or average clinician unit in the sample. The exponent of this log (exp b) equals -1.35. This exponent is the odds ratio (i.e., the probability of adhering to mental health care divided by the probability of not adhering to care) in a typical clinician unit. The odds ratio translates into an estimated probability of adhering to mental health care of .20 in a typical unit, which is slightly higher than the overall proportion of consumers in the sample who report adhering to mental health care (.19). This is a function of the difference between individual level and unit level rates of adherence to care.

Predictors of Adherence

Bivariates.

Table 4.1 illustrates the results of the bivariate relationships between consumer and clinician characteristics and treatment adherence. The consumer bivariate results indicate that the consumer version of the *Working Alliance Bond* subscale is predictive of treatment attendance and adherence at baseline but does not consistently predict for adherence at six months, even when controlling for a change in clinician during that time. In addition to this finding, baseline characteristics of being older than 42 and having a diagnosis of schizophrenia were significantly related to the likelihood of being adherent to mental health

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services, whereas individuals with a diagnosis of bipolar disorder were less likely to adhere to mental health services.

Of the clinician-level variables, clinicians with more years of experience were more likely to have adherent consumers than those of lesser experience. Also, the consumers' working alliance bond at six months was significantly related to adherence, and there was a trend for clinicians who have a greater working alliance goal to be related to adherence.

Table 4.1: Bivariate Hierarchical Logistic Models Predicting Consumer Treatment Adherence at 6 months

Model Variable	Coefficient	Odds Ratio (95% C.I.)		SE	T-ratio	*P*
Consumer Level Demographics						
Gender (Male = 1)	-0.08	0.92	(0.53 -1.59)	0.28	-0.30	
Median Age (>42 years old)	0.82	2.27	(1.31 -3.94)	0.28	2.92	**
Race (African American = 1)	-0.04	0.96	(0.56 -1.65)	0.27	-0.16	
Consumer Level Clinical Variables						
Diagnosis						
Schizophrenia	1.17	3.22	(1.71 -6.03)	0.32	3.65	***
Bipolar Disorder	-0.69	0.50	(0.25 -0.99)	0.34	-2.01	*
Substance Abuse	-0.42	0.66	(0.23 -1.89)	0.53	-0.78	
Insight (Median ITAQ score >20)	-0.18	0.84	(0.47 -1.48)	0.29	-0.62	
Change in Case Manager	-0.32	0.73	(0.35 -1.50)	0.37	-0.87	
Consumer Level Experimental Intervention						
Facilitated Psychiatric Advanced Directive	-0.26	0.77	(0.43 -1.37)	0.29	-0.89	
Consumer Level Psychological Mechanisms						
Working Alliance Inventory						
Bond Subscale (Baseline)	0.10	1.10	(1.00 -1.21)	0.05	2.04	*
Bond Subscale (Six Month)	0.04	1.04	(0.96 -1.13)	0.04	0.98	
Goals Subscale (Baseline)	0.03	1.03	(0.95 -1.12)	0.04	0.74	
Goals Subscale (Six Month)	0.03	1.03	(0.95 -1.12)	0.04	0.73	
Treatment Motivation Questionnaire						
Intrinsic Subscale (Baseline)	-0.01	0.99	(0.96 -1.03)	0.02	-0.55	
Intrinsic Subscale (Six Month)	0.01	1.01	(0.98 -1.05)	0.02	0.70	
Extrinsic Subscale (Baseline)	-0.03	0.97	(0.93 -1.01)	0.02	-1.36	
Extrinsic Subscale (Six Month)	0.01	1.01	(0.97 -1.05)	0.02	0.63	

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Locus of Control Subscale (Baseline)	-0.02	0.98	(0.95	-1.02)	0.02	-0.90	
Locus of Control Subscale (Six Month)	-0.02	0.98	(0.94	-1.02)	0.02	-1.16	
Motivated by Guilt Subscale (Baseline)	-0.02	0.98	(0.94	-1.02)	0.02	-1.20	
Motivated by Guilt Subscale (Six Month)	0.02	1.02	(0.98	-1.05)	0.02	0.83	
Relational Subscale (Baseline)	-0.01	0.99	(0.96	-1.02)	0.01	-0.68	
Relational Subscale (Six Month)	0.00	1.00	(0.98	-1.03)	0.01	0.16	
Case Manager Level Covariates							
Gender (Male)[1]	-0.25	0.78	(0.36	-1.70)	0.40		
Age	-0.02	0.99	(0.97	-1.01)	0.01	-1.47	
Years of Experience	0.04	1.04	(1.01	-1.08)	0.02	2.32	**
Working Alliance Inventory							
Bond Subscale (Baseline)	0.04	1.04	(0.88	-1.24)	0.09	0.47	
Bond Subscale (Six Month)	0.10	1.10	(1.00	-1.21)	0.05	2.02	*
Goals Subscale (Baseline)	-0.01	0.99	(0.69	-1.43)	0.18	-0.06	
Goals Subscale (Six Month)	0.12	1.13	(0.99	-1.29)	0.07	1.81	~

[1]Covariate would not converge - used logistic model for estimate
~Trend at p < .10
* Significant at p < .05
** Significant at p < .01
***Significant at p <.001

Domains.

As shown in Table 4.2, the domain level models reveal that when controlling for diagnoses of schizophrenia and bipolar disorder (reference category is major depression with psychotic features), that a diagnosis of schizophrenia is significantly related to treatment adherence, meaning that individuals with a diagnosis of schizophrenia have twice the odds of adhering to treatment than individuals with bipolar or major depressive disorders. Additionally, there is a trend in the relationship between a greater rating of the *Working Alliance Bond* subscale at baseline and adherence to mental health treatment at 6 months.

Table 4.2: Hierarchical Logistic Model of Domains Predicting Consumer Treatment Adherence at 6 months

Model	Variable	Coefficient	Odds Ratio (95% C.I.)			SE	T-ratio	p
Consumer Level Variables								
	Diagnosis							
	Schizophrenia	2.10	8.19	(1.89	-35.47)	0.74	2.83	**
	Bipolar Disorder	1.21	3.35	(0.71	-15.84)	0.79	1.53	
	Working Alliance Inventory							
	Bond Subscale (Baseline)	0.09	1.10	(0.99	-1.22)	0.05	1.83	~
	Bond Subscale (Six Month)	0.01	1.01	(0.92	-1.10)	0.05	0.12	
Case Manager Level Covariates								
	Working Alliance Inventory							
	Bond Subscale (Baseline)	0.10	1.10	(0.77	-1.57)	0.17	0.58	
	Bond Subscale (Six Month)	0.15	1.16	(0.84	-1.60)	0.15	0.97	
	Goals Subscale (Baseline)	-0.17	0.84	(0.38	-1.87)	0.38	-0.45	
	Goals Subscale (Six Month)	-0.19	0.83	(0.50	-1.36)	0.24	-0.80	

~Trend at p < .10
* Significant at p < .05
** Significant at p < .01
***Significant at p <.001

Final Model.

As shown in Table 4.3, two consumer-level covariates are significant in the final model when controlling for PADs and a change in case manager. Consumers older than 42 years of age have more than twice the odds of being adherent than younger consumers. Also, consumers with schizophrenia have three times the odds of being adherent to mental health treatment than individuals with major depression with psychotic features and bipolar disorder. Finally, there is a trend between clinicians with more mental health experience and adherence, although this is not significant.

Table 4.3: Hierarchical Logistic Final Model Predicting Consumer Treatment Adherence at 6 months

Model	Variable	Coefficient	Odds Ratio (95% C.I.)			SE	T-ratio	p
Consumer Level Variables								
	Median Age (>42 years old)	0.81	2.25	(1.21	-4.19)	0.31	2.58	**
	Schizophrenia	1.11	3.04	(1.52	-6.09)	0.35	3.15	**
	Working Alliance Inventory							
	Bond Subscale (Baseline)	0.08	1.08	(0.97	-1.21)	0.06	1.42	

Variable	Coefficient	Odds Ratio	(95% C.I.)		SE	T-ratio	p
Change in Case Manager	-0.34	0.71	(0.26	-1.96)	0.51	-0.66	
Psychiatric Advance Directive	-0.36	0.70	(0.37	-1.31)	0.32	-1.13	
Case Manager Level Covariates							
Years of Experience	0.04	1.04	(1.00	-1.08)	0.02	1.95	~

~Trend at $p < .10$
* Significant at $p < .05$
** Significant at $p < .01$
***Significant at $p < .001$

Lastly, in Table 4.4, the cross-level interaction or moderating effect of clinicians' years of experience on consumers' intrinsic motivation on predicting adherence was analyzed. The statistically significant cross-level interaction indicates that all things being equal, there is a joint effect between the incremental increase in case manager years of experience and consumers' intrinsic motivation for treatment.

Table 4.4: Cross-level Interaction between consumers' intrinsic motivation and case managers' years of experience

Model	Variable	Coefficient	Odds Ratio (95% C.I.)			SE	T-ratio	p
Cross-level Interaction								
	Consumer Intrinsic Motivation for Treatment by Case Managers Years of Experience	0.001	1.037	(1.01	-1.06)	0.0003	2.86	**

~Trend at $p < .10$
* Significant at $p < .05$
** Significant at $p < .01$
***Significant at $p < .001$

Discussion

In general, previous research has shown that adherence to mental health treatment leads to better outcomes such as a decrease in symptoms and better global functioning. Adherence also reduces costs and hospitalizations in the mental health system. More importantly, adherence also reduces the risk of consumers becoming violent or being victimized. This study illustrates that consumers who are older than 42 and diagnosed with schizophrenia tend to be more adherent than others. Unfortunately, the current study does not

offer support that working alliance and treatment motivation alone lead to treatment adherence among persons with severe mental illness. However, the number of years a clinician has been in mental health treatment was found to moderate adherent behavior through consumers' intrinsic motivation to attend treatment.

Although the consumers' bond of the working alliance was predictive of adherence within the bivariate analyses, working alliance becomes non-significant when other variables are entered into the model. The results illustrate that other clinical diagnosis variables and illness course variables are more predictive of adherence than psychological and social variables like treatment motivation and working alliance alone. There could be numerous reasons for this lack of methodological and substantive findings.

Methodologically, the lack of predictive validity may be in part due to the stringent operationalization of adherence in this study. In essence, there may be measurement error because the adherence variable could be enabling the study to only predict the most adherent individuals. Indeed, varying levels of adherence may certainly aid in the prediction of different levels of adherence. However, the current study was limited by variables with binomial distributions which did not allow for such analyses. Additionally, the definition of adherence used in this study may be different from those identified from other studies that support the direct relationship between intrinsic motivation and adherence.Further work is needed to create a better measure of adherence and to then better evaluate the predictive validity of the TMQ and WAI in people with SMI.

Substantively, working alliance and treatment motivation may not have a direct impact on adherence because taking into account the context of the relationship with the clinician is necessary in order to begin to understand the interplay between the relational

alliance and the consumers' willingness to engage and maintain treatment attendance and adherence. Further, the complicated exchange between consumer and clinician around treatment decision making which leads to adherence or lack of adherence could be crucial to predicting adherence. Future studies need to investigate the relationship between working alliance and shared decision making in mental health care. However, the substantive findings may also be diffused by other elements of the mental health system. During the course of the study, a process of mental health reform North Carolina resulted in privatization of services, which altered the context, location, and providers of services for the majority of consumers within the study. Even if mental health care reform alone did not decrease the availability of services, changes in clinicians and their site locations may have (at least temporarily) reduced attendance for all but the most psychiatrically stable.

Indeed, beyond the confounding historical effect that may impact the result of this study, there may be factors that impact treatment attendance. Factors such as mental health symptoms may inhibit treatment attendance. For example, the negative and positive symptoms of schizophrenia may contribute significantly to the lack of adherence to treatment. Within negative symptoms, or "absence of normal functions" (Ananth et al., 1991), there is the symptom of avolition -- the inability to initiate and persist in goal directed activities -- which interferes with motivation for treatment and daily life choices (Ananth et al., 1991). Also, positive symptoms such as hallucinations, delusions, grandiosity, and paranoia also have been found to predict treatment non-adherence to medication and emergency psychosocial treatment (Mulder, Koopmans, & Hengeveld, 2005). Other issues often associated with SMI are lack of insight and substance abuse. These issues are often

believed to be related to the lack of treatment adherence, although these variables were not significantly related to adherence in this study.

However, the complexity of predicting adherence to medical and psychosocial treatment is not limited to the symptom manifestations and comorbidities of SMI; the treatment context is also important because mental health systems offer a broad range of services. Indeed, this study was not able to control for the types of services delivered to consumers. Future research may focus on treatment motivation and working alliance within specific services. For example, Assertive Community Treatment (ACT) may have individuals with greater external pressures attend care than those in usual outpatient care settings; the individuals, however, may also feel a greater working alliance with their clinicians because of the frequent contact of ACT clinical care.

Limitations of these findings are that the outcomes are specific to overall care within a service system undergoing mental health reform. Due to this reform, adherence to services may be affected along with the turn over of clinicians within the system. Thus, although the study controlled for the change of clinician, there were no controls for changes in the mental health care system which may have affected subjects differently, depending on when they were enrolled.

Further research is needed on the role of the mental health worker in the consumers' adherence to mental health treatment. Specifically, qualitative studies should focus on the skills and tools performed and provided by clinicians with experience in the field in order to further discover the clinical skills that lead to adherence. The clinicians' caseload size, productivity demands, and educational background may play an important role in the working alliance experienced by consumers. Also, the clinicians' education may influence

their ability to have knowledge of or implement evidence based practices. Lack of effectiveness in clinical practice can result in worker burnout and discouragement which in turn sabotages a healthy working alliance.

In closing, the findings support the notion that individuals with schizophrenia may be more adherent to mental health treatment due to psychiatric stabilization and recovery that comes with older age. Although the psychological mechanisms of motivation and working alliance were not directly predictive of treatment adherence within this study, the context of a clinicians years of experience combined with a consumers' intrinsic motivation was related to an increase in treatment adherence among people with SMI. Future research on adherence and attendance to mental health services should include predictors of mental health symptoms, legal mandates, clinician characteristics and other Biopsychosocial factors related to mental health care.

CHAPTER 5

CONCLUSIONS

Mental health professionals face the challenge of understanding and predicting psychosocial treatment attendance and medication adherence among adults with severe mental illness. This series of studies aimed to contribute to the knowledge base by validating measures for use in clinical practice and using those measures in order to predict mental health service adherence so that mental health service providers might better promote adult mental health.

Validation of the Treatment Motivation Questionnaire

The exploratory analysis in a confirmatory framework lends further support for the current conceptual framework of self-determination theory (SDT) and organismic integration theory (OIT). Specifically, two sub-dimensions of external motivation (i.e., external and introjected) were uncovered within these analyses. Importantly, these results indicate that different types of external motivators are at work in motivating treatment participation by people with severe and persistent mental illness. Due to the use of external motivation in many of the treatments for this population, the TMQ may be helpful in assessing the impact that external motivation has on treatment adherence.

The current analysis confirms the applicability of the SDT conceptual framework for understanding treatment adherence (or lack of adherence) among people with severe mental illness. Although the literature on treatment adherence among SMI individuals often highlights

the role of coercion and external motivators, little has been done to explore other types of self-determined regulators or motivations that may actually drive or inhibit treatment engagement in this population. Knowing more about the specific types of motivation that support long-term treatment adherence in these individuals would help clinicians in their efforts to engage patients in beneficial therapies.

Confirming the Working Alliance Inventory -Short Form

In this study, a truncated version of the WAI short form was tested within a sample of people with SMI and their clinicians. Our overall finding provides moderate support for the original factor structure and strong support for a higher-order model for this population. The excellent model fit for both consumer and clinician second order structure indicates that the two subscales of Bond and Goals in the working alliance relate to the larger construct of working alliance thus summing the subscales to create a total score can be done. Secondly, the internal reliability of the scales and subscales were excellent, which further supports the use of the subscales and the total score within this population. Finally, this study illustrates that the construct of working alliance for consumers and clinicians is not necessarily correlated if the duration of the working alliance does not support the time for this development. Overall, the WAI short form proves to be a reliable and brief scale that could easily be administered by clinicians in order to better monitor their practices.

Predicting mental health treatment attendance and adherence

Overall, the current study failed to demonstrate a relationship between working alliance or treatment motivation and adherence. Although the bond of the working alliance was predictive of adherence within the bivariate analyses, there were other covariates that strongly predicted

treatment adherence. However, these findings may be affected by changes in the mental health care system in North Carolina which occurred during the course of the study.

However, the complexity of predicting adherence to medical and psychosocial treatment is not limited to the context of the mental health system. Other biopsychosocial factors may impede treatment adherence such as symptom manifestations, comorbidities, the type of treatment, financial resources, and available transportation. The findings support the notion that individuals with schizophrenia may be more adherent to mental health treatment due to psychiatric stabilization and recovery that comes with older age.

Limitations

There are several limitations to the current research. Specifically, the context of mental health care reform in the state of North Carolina during the time of data collection could have created uncontrollable historic effects. Additionally, psychological mechanisms to treatment adherence are difficult to interpret without the context of the known treatment type. Although the predictive validity of the truncated WAI short form was modestly related to treatment adherence, without a context of treatment type, the therapeutic behaviors associated with mechanism are largely unknown.

Additionally, there are limitations specific to each study. The TMQ validation study evaluates a scale that is in need of further scale development. Indeed, other subscales need to be created and tested within this population. The WAI short form used in this research is missing the Task subscale, and although this data confirms a portion of the scale, more work is needed to confirm the scale in its entirety. Lastly, due to unanticipated negative consequences of mental health care reform in the state of North Carolina, adherence to services may be negatively affected by additional barriers, such as turnover of clinicians within the system.

Future directions

The research highlights the need to learn more about psychological mechanisms to adherence among people with severe mental illness. Specifically, further scale development and validation is needed in the areas of treatment motivation and working alliance. The TMQ validation study used an exploratory factor analysis in a confirmatory framework. This method should not confuse future researchers, in that confirmatory work is still needed on this measure. However, before confirmatory work can be accomplished, development of questions relating to the sub-dimensions of external motivation (i.e., identified and integrated motivation) need to be developed and piloted within this population. Further, the WAI-short form also is in need of further validation in order to confirm the factor structure with the added Task scale and in order to evaluate whether the scale needs item reduction to decrease redundancies.

Although the psychological mechanisms of motivation and working alliance were not predictive of treatment adherence within this study, future research should focus on exploring and measuring attitudes, motivations, and relational support that may lead to increased treatment adherence in SMI. Until research can better explain the reasons for adherence, efforts to increase adherence will fall short of successful outcomes.

APPENDICES

Appendix I: TMQ Polychoric Correlations

	1	2	3	5	6	7	9	10	11	12	13	14
1	1											
2	0.15	1										
3	0.34	0.26	1									
5	0.26	0.42	0.27	1								
6	0.21	0.15	0.2	0.41	1							
7	0.13	0.26	0.23	0.65	0.54	1						
9	0.15	0.27	0.25	0.66	0.47	0.76	1					
10	-0.06	0.51	0.24	0.3	0.02	0.4	0.36	1				
11	0.32	0.04	0.29	0.24	0.34	0.11	0.22	-0.17	1			
12	0.12	-0.2	-0.01	0.05	0.17	0.02	0.05	-0.44	0.28	1		
13	-0.01	0.55	0.19	0.21	-0.08	0.25	0.12	0.64	-0.24	-0.35	1	
14	0.13	-0.13	-0.02	0.12	0.13	-0.02	0.12	-0.3	0.32	0.53	-0.32	1
15	0.11	0.29	0.26	0.27	0.11	0.26	0.19	0.35	0.07	-0.15	0.43	-0.14
16	0.09	0.34	0.18	0.18	0.05	0.17	0.1	0.47	0	-0.23	0.43	-0.21
17	0.02	0.38	0.2	0.18	0.07	0.18	0.18	0.47	0	-0.23	0.41	-0.25
18	0	0.34	0.06	0.21	-0.06	0.23	0.17	0.49	-0.21	-0.32	0.61	-0.2
19	0.1	-0.13	0.02	0	0.03	-0.08	0.09	-0.32	0.21	0.56	-0.32	0.65
20	0.08	0.3	0.19	0.21	0.08	0.17	0.13	0.4	-0.01	-0.27	0.43	-0.2
21	0.01	0.51	0.17	0.24	-0.06	0.24	0.15	0.63	-0.13	-0.34	0.59	-0.31
22	0.21	-0.18	-0.06	0.1	0.08	-0.02	0.11	-0.37	0.28	0.61	-0.36	0.71
23	0.02	0.25	0.25	0.19	0.04	0.15	0.16	0.46	0.02	-0.27	0.37	-0.23
24	0.02	0.38	0.12	0.32	0.13	0.34	0.31	0.48	-0.03	-0.23	0.46	-0.14
25	-0.07	-0.22	-0.17	-0.15	-0.05	-0.2	-0.05	-0.56	0.05	0.56	-0.56	0.46

Appendix I: TMQ Polychoric correlations (continued)

	15	16	17	18	19	20	21	22	23	24	25
15	1										
16	0.77	1									
17	0.63	0.74	1								
18	0.28	0.35	0.47	1							
19	-0.2	-0.26	-0.37	-0.31	1						
20	0.68	0.7	0.62	0.35	-0.2	1					
21	0.46	0.57	0.56	0.6	-0.45	0.51	1				
22	-0.12	-0.19	-0.26	-0.27	0.75	-0.21	-0.44	1			
23	0.7	0.73	0.73	0.39	-0.3	0.78	0.48	-0.31	1		
24	0.44	0.47	0.6	0.46	-0.24	0.52	0.5	-0.22	0.61	1	
25	-0.42	-0.41	-0.39	-0.42	0.57	-0.4	-0.52	0.6	-0.45	-0.39	1

Appendix II: Correlation Matrix of Clinician WAI

Items	a	b	c	d	e	f	g	h
(a) Have a common perception of the client's goals.	1							
(b) The current goals of the work are important to client.	0.625	1						
(c) Have established a good understanding of the kinds of changes that would be good for client.	0.778	0.512	1					
(d) Are working toward mutually agreed upon goals.	0.757	0.631	0.775	1				
(e) Feel confident in clinician's ability to help client.	0.624	0.504	0.659	0.67	1			
(f) The relationship is important to the client.	0.655	0.397	0.697	0.662	0.64	1		
(g) The client has trust in clinician.	0.671	0.442	0.728	0.711	0.619	0.849	1	
(h) Have established a strong working alliance and rapport.	0.709	0.463	0.745	0.741	0.65	0.834	0.889	1

Appendix III: Correlation Matrix of Consumer WAI

Items	a	b	c	d	e	f	g	h
(a) Have a common perception of the client's goals.	1							
(b) The current goals of the work are important to client.	0.74	1						
(c) Have established a good understanding of the kinds of changes that would be good for client.	0.72	0.73	1					

(d) Are working toward mutually agreed upon goals.	0.75	0.73	0.81	1			
(e) Feel confident in clinician's ability to help client.	0.73	0.78	0.78	0.76	1		
(f) The relationship is important to the client.	0.67	0.77	0.7	0.7	0.82	1	
(g) The client has trust in clinician.	0.67	0.69	0.71	0.68	0.8	0.85	1
(h) Have established a strong working alliance and rapport.	0.74	0.7	0.75	0.68	0.84	0.81	0.82	1

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