

Therapeutic change may begin before the therapist and patient ever meet: Pre-treatment alliance changes predict clinical outcomes

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Abstract:

Mechanisms of change are widely assumed to be activated by the onset of treatment. This foundational premise underlies decades of psychotherapy research and guides the timing of measurement and intervention in clinical science. Here, we challenge this assumption by showing that one of the most well-established and robust predictors of treatment outcome—the therapeutic alliance—not only fluctuates before therapy begins, but that these early, pre-treatment fluctuations predict both alliance development and symptom reduction across treatment. In a randomized controlled trial for depression (N=100), the therapeutic alliance was assessed twice before patients met their therapist, and weekly thereafter. The trajectory of alliance change before the first session significantly predicted subsequent alliance dynamics and clinical improvement, above and beyond baseline levels. The findings remained robust even after controlling for pre-treatment outcome expectations. These findings suggest that mechanisms traditionally viewed as the result of treatment targeting may, in fact, be antecedents. By revealing pre-treatment shifts in a mechanism once thought to be non-existent prior to patient–therapist contact, this work may challenge fundamental assumptions in clinical psychology and highlights the need to reconceptualize therapeutic change as a dynamic, temporally extended process that may begin before any intervention has occurred. Such a shift has implications for how we define, measure, and intervene on core mechanisms of human change.

Keywords: Mechanisms of change, Alliance, Process-outcome research

Introduction

Decades of empirical research sought to identify the mechanisms bringing therapeutic change. Many hundreds of clinical trials [1, 2] have been conducted to shed light on therapeutic mechanisms with the overarching ultimate goal of improving treatment efficacy [3]. But these studies have produced few consistent insights about the mechanisms underlying effective treatments [4]. As a result, few, if any, improvements in treatment efficacy have been achieved in the past five decades [1, 2].

A potential reason for the absence of meaningful progress may be one of the critical underlying assumptions at the basis of the majority of the literature stating that before the start of treatment, the mechanisms are “inactive.” Therefore, to evaluate their baseline level, a snapshot—a one-time point assessment before the start of treatment—is enough. During treatment, those mechanisms may be targeted effectively and “turned on” to become activated. Consequently, current research on mechanisms of change evaluates them repeatedly, at multiple time points, but only during the course of treatment [5].

This critical assumption underlying most research on mechanisms of change stands in contrast to recent research on psychopathology, which regards mental health as a dynamic phenomenon that fluctuates over time [6, 7]. Several studies have even shown such fluctuation before the start of treatment, focusing on mental health symptoms [8, 9].

To test this critical assumption regarding the pretreatment inactivity of mechanisms of change, we focused on the therapeutic alliance between the patient and therapist as proof of concept. Three main reasons make the alliance an ideal proof of concept for this aim: (a) the alliance is one of the only mechanisms of change regarding which there is no dispute that it is associated

with treatment efficacy, as demonstrated in hundreds of studies [10]; (b) the alliance is a transtheoretical mechanism across various treatment orientations [11], therefore findings are not restricted to particular treatments; and (c) the alliance is conceptualized as a product of the interpersonal relationship between patient and therapist, therefore it is perceived not only as not changing but even as non-existent before the start of treatment. The alliance is commonly defined as consisting of the emotional bond between the patient and the therapist and the agreement between them on the tasks and goals of treatment [12]. Both the emotional bond and agreement are conceptualized as a product of interactions between the patient and the therapist, therefore perceived as not existing before the start of treatment.

To prove meaningful pretreatment instability (rather than noise-based fluctuations originating, for example, in measurement issues), it is critical to show that any fluctuation in the mechanism of change before the start of treatment has clinical implications. In the present study, we investigated the ability of change in two measures of alliance taken *before* the start of treatment to predict (a) the development of alliance from one session to the next during the entire duration of treatment, and (b) changes in treatment efficacy throughout the entire treatment. We used the data from a recently conducted RCT of major depressive disorder [13](MDD), the leading cause of disability worldwide [14].

Methods

Study design and participants

The sample included 100 individuals with MDD participating in an RCT [13], randomized to one of two 16-week short-term treatments focusing on improving interpersonal relationship patterns, provided by 6 experienced therapists. The patients' demographic and clinical characteristics are presented in Table 1. Inclusion criteria: (a) current MDD diagnosis using structured clinical interviews for DSM-V, with scores above 14 on the 17-item HRSD [15] at two evaluations, one week apart, and current MDD based on the Mini-International Neuropsychiatric Interview [16]; (b) if on medication, patients' dosage had to be stable for at least three months before the start of the study, and patients were asked to maintain stable dosage for the duration of treatment; (c) age between 18 and 60 years; (d) Hebrew language fluency; (e) written informed consent. Exclusion criteria: (a) current high risk of suicide or self-harm (HRSD suicide item >2); (b) current substance abuse disorder; (c) current or past schizophrenia, psychosis, bipolar disorder, or severe eating disorder, requiring medical monitoring; (d) history of organic mental disease; (e) currently in psychotherapy. Similarly to many other RCTs for MDD and as *a priori* hypothesized, no differences have been found between treatments in their efficacy. The trial protocol [17] and main outcome [13] provide further details about the trial.

Measures

Psychiatric disorders. The Mini-International Neuropsychiatric Interview [16](MINI) was administered to assess the presence and severity of depression and comorbid conditions.

Treatment outcome. The outcome measure was the HRSD [15], a semi-structured interview containing 17 items assessing the patient's symptoms in the preceding week. For the present study, the inter-rater reliability of the HRSD was $ICC=.98$.

Alliance. Since there is no common measure of alliance before the start of treatment (based on the assumption that there is no alliance before the start of treatment), we used the most common alliance measure, the Working Alliance Inventory [18](WAI), with the following instruction: “Because you have not yet experienced treatment as part of this study, answer the following questions by thinking about how you expect treatment to be.” Items were rated on a 7-point Likert scale ranging from 1 (Never) to 7 (Always). This adaptation of the WAI was found to have strong psychometric properties, as manifested in high internal reliability and a high convergent validity [19, 20]. Internal reliability for the present study was .90. To the best of our knowledge, only one additional clinical trial incorporated this measure [19], and other than the current trial, no study to date has evaluated this measure more than once before the start of treatment. Throughout treatment, the original version of the WAI was used.

Statistical analysis overview

Analyses were conducted using a three-level hierarchically nested model of observations across time, nested within patients, nested within therapists, using the nlme package in R. The models included a random intercept for patients and therapists, and a fixed slope of sessions over time. To test our hypotheses, as the predictor, we used the changes between the two consecutive alliance observations before the start of treatment (ΔPre_WAI). To test the ability of the pretreatment changes to predict the evolution of alliance (Model 1) and outcome (Model 2) in the course of treatment, we used the interaction between the changes in alliance pretreatment

($\Delta\text{pre_WAI}$) and session number (slope) to predict the alliance (Model 1) and outcome (Model 2) for sessions 1-16, controlling for the main effects of session and pretreatment changes in alliance. To account for a potential effect of the sum level of the alliance before the start of treatment, we also controlled for the interaction between session number (slope) and the sum of the two alliance observations pretreatment (S_Pre_WAI), as well as the main effect of the sum pretreatment alliance to the model.

The model equations for predicting alliance (Model 1) and outcome (Model 2) were as follows:

$$\text{Model 1. } WAI_{ijt} = b_0 + b_1 * s + b_2 * \Delta\text{pre_WAI}_i + b_3 * \Delta\text{pre_WAI}_i * s + b_4 * S_Pre_WAI_i + b_5 * S_Pre_WAI_i * s + u_{1_j} + u_{2_{ij}} + e_{ijt}$$

$$\text{Model 2. } HRSD_{ijt} = b_0 + b_1 * s + b_2 * \Delta\text{pre_WAI}_i + b_3 * \Delta\text{pre_WAI}_i * s + b_4 * S_Pre_WAI_i + b_5 * S_Pre_WAI_i * s + u_{1_j} + u_{2_{ij}} + e_{ijt}$$

where WAI_{ijt} and $HRSD_{ijt}$ are the WAI and HRSD scores of patient i treated by therapist j at session t , respectively. $\Delta\text{pre_WAI}_i$ and $S_Pre_WAI_i$ are the changes and sum of alliance pretreatment of patient i , respectively. u_{1_j} and $u_{2_{ij}}$ are the random effects (intercepts) of therapist j and patient i treated by therapist j , and e_{ijt} is the random error. All random effects are assumed to be independent and normally distributed.

Results

Model 1. The changes in alliance pretreatment were a significant predictor of alliance development throughout treatment. The greater the strengthening of the alliance pretreatment, the greater its strengthening throughout treatment. Findings further indicate that the sum alliance pretreatment was almost significantly a predictor of alliance development throughout treatment. The lower the sum pretreatment, the greater the development throughout treatment.

Model 2. The changes in alliance pretreatment were a significant predictor of HRSD development throughout treatment. The greater the strengthening of the alliance pretreatment, the greater the reduction in depressive symptoms throughout treatment. The sum alliance pretreatment was not a significant predictor of HRSD development throughout treatment.

Sensitivity analyses. Similar findings were obtained repeating the analyses accounting for: (a) A potential effect of treatment condition. (b) A potential effect of pre-treatment outcome expectations. (c) A potential effect of differences between therapists (see Tables S1-3 in the online supplements).

Discussion

To the best of our knowledge, this is the first study to test the critical assumption underlying the vast majority of empirical research on mechanisms of change. In contrast to the common assumption, and consistent with the most recent research in psychopathology, the findings suggest that clinically meaningful fluctuations appear in the therapeutic alliance before the patient and therapist have ever met. These fluctuations were found to predict the development of the alliance between patient and therapist and treatment efficacy over the entire course of treatment. The greater the increase in alliance strength before the start of treatment, the greater the strengthening of the alliance and the reduction of symptoms over the course of treatment.

These findings demonstrate the inaccuracy of one of the critical assumptions underlying the research on mechanisms of change and may explain why decades of research produced little consistent knowledge on mechanisms of therapeutic change, and in turn, a scant improvement in treatment efficacy [1, 2]. In their synthesis of the literature, Cuijpers and colleagues [4] have concluded that “Until now, much research has focused on RCTs, with many hundreds of such trials showing that therapies work but not how they work. There is also a lot of research on the processes and potential working mechanisms of therapies... It is as if we have been in the pilot phase of research for five decades without being able to dig deeper” (p. 224). Correcting one of the critical assumptions of research on mechanisms of change has the potential to transform this field and make possible the much-needed improvement in treatment efficacy to reduce global suffering from mental health disorders.

The current findings represent a proof of concept that needs to be replicated in future research addressing the limitations of the present study, the most critical one being the relatively small

sample size and the need to generalize the findings to a large diversity of populations, clinical settings, mental health disorders, and mechanisms of therapeutic change. Future studies should use multiple pre-treatment measurements to explore the internal and external factors influencing the dynamic of mechanisms of change before the start of treatment and the time frames in which the changes occur. The present findings point to the importance of bridging two fields of empirical research, currently progressing in isolation: psychotherapy and psychopathology. The mechanisms producing psychopathology and the mechanisms inducing therapeutic change may be one.

Table 1. Demographic and clinical characteristics of the sample

<i>Variables</i>	
Demographics	
Age, y, mean (SD)	31.2 (8.25)
Education, y, mean (SD)	14.2 (2)
Female	57 (57)
Income > average	25.7 (25)
Married/cohabitating	14 (14)
Employed	69.3 (68)
Religion, Jewish	80 (80)
Clinical features	
Current medication, yes	14 (14)
Previous medication, yes	23.9 (23)
Previous psychotherapy, yes	46.4 (46)
Comorbidities	
Any disorder	71 (71)
Any anxiety disorder	71 (71)
Any personality disorder	74 (74)
Drop-outs	7 (7)

Table 2. Pretreatment changes in alliance as a predictor of alliance (Model 1) and outcome (Model 2) throughout treatment

Note. Δ_Pre_WAI – pretreatment changes in alliance; S_Pre_WAI = sum of the two alliance assessments pretreatment; SE, standard error; Partial η^2 was calculated by *effectsize* package or R.

Mechanisms activated pretreatment

Model	Predictor	Estimate	SE	t value	p value	Partial η^2
Model 1: WAI	Session	0.08	0.02	4.00	.0001	0.01
	Δ Pre_WAI	-0.16	0.14	-1.15	.25	0.01
	S_Pre_WAI	0.33	0.06	5.84	.0001	0.23
	Δ Pre_WAI $\times$ Session	0.016	0.005	2.50	.01	0.005
	S_Pre_WAI $\times$ Session	-0.004	0.002	-1.95	.05	0.003
Model 2: HRSD	Session	-0.27	0.17	-1.60	.11	0.002
	Δ Pre_WAI	-0.28	0.84	-0.34	.74	0.001
	S_Pre_WAI	0.75	0.34	2.19	0.03	0.040
	Δ Pre_WAI $\times$ Session	-0.13	0.04	-3.42	.0006	0.008
	S_Pre_WAI $\times$ Session	-0.03	0.02	-1.70	.09	0.002

Statements:**Statement of Ethics:**

This study was performed in accordance with the Declaration of Helsinki. This human study was approved by University of Haifa IRB committee - approval: 186/ 15. The study's clinical trial registration number is NCT02728557 registered with <https://clinicaltrials.gov/study/NCT02728557?term=ZILCHA%20MANO&rank=3>. All adult participants provided written informed consent to participate in this study. Written informed consent was obtained from the individuals for publication of the details of their medical case and any accompanying images.

Conflict of Interest Statement:

The author has no conflicts of interest to declare.

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Author contributions:

Conceptualization: SZM, Methodology: SZM, Investigation: SZM, Visualization: SZM,
Funding acquisition: SZM, Writing – original draft, review, and editing: SZM

Data and materials availability: The analyses code appears online. The informed consent form signed by the participants stated that we would keep the data strictly confidential. The data are currently not available because to share the data, we must obtain the consent of our participants and of the Ethics Committee. Further enquiries can be directed to the corresponding author.

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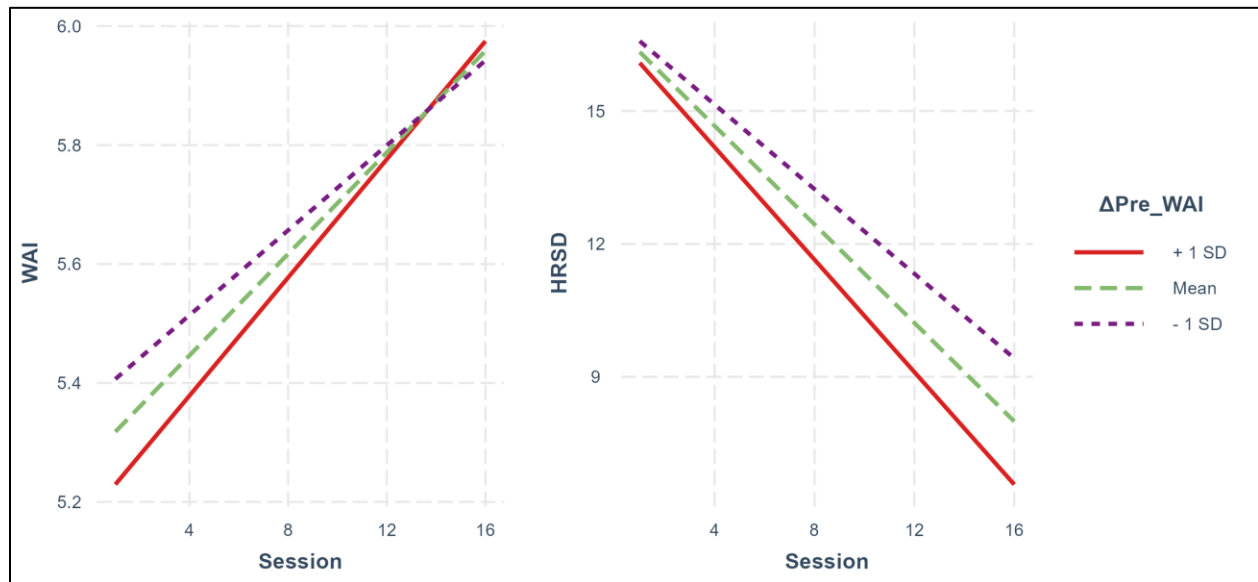


Figure 1. Pretreatment changes in alliance as a predictor of alliance (left) and outcome (right) throughout treatment