

# Not Just a Non-specific Factor: Moderators of the Effect of Within- and Between-Clients Alliance on Outcome in CBT

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**Abstract** The working alliance is one of the most consistent predictors of outcome. Yet, little empirical knowledge exists on how therapists can use this association to maximize the outcome of cognitive behavioral therapy (CBT) for individual clients. The present study aimed to examine pre-treatment client interpersonal characteristics that determine what function the alliance should fulfill in order to maximize its effect on outcome. We did so by identifying moderators of the within- and between-clients effects on outcome. Data of 185 clients receiving CBT treatment was disaggregated to study the effects of the within- and between-clients alliance on outcome. Findings suggest that for clients who described themselves as overly cold and were described by their therapists as low on intrusiveness, state-like strengthening of alliance predicted better outcome, and that for clients not overly cold but overly exploitable, the general tendency of the client to report stronger alliance was associated with better outcome.

**Keywords** Alliance · Interpersonal problems · Process-outcome moderator · Alliance-outcome association · Rupture resolution patterns

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## Introduction

Effective psychotherapies are generally characterized by good working alliances between clients and their therapists (Crits-Christoph et al. 2013). The working alliance is commonly defined as the emotional bond established in the therapeutic dyad, and the agreement between the two about the goals of therapy and the tasks needed to achieve them (Bordin 1979). The quality of the therapeutic alliance is a consistent predictor of outcome in psychotherapy, with stronger alliances being associated with better therapeutic outcomes (Horvath et al. 2011). Although questions have been raised about the direction of causality in this association (Barber 2009; DeRubeis et al. 2005), recent studies started to establish a correct temporal relationship between alliance and subsequent outcome (Falkenström et al. 2013; Zilcha-Mano et al. 2014).

Throughout the development of behavioral therapy, it was clear to many that the quality of the relationship between clients and therapists has important consequences for treatment success (Goldfried and Davison 1976). It has been suggested that alliance is a necessary but not a sufficient ingredient of any successful treatment (Beck et al. 1979; Brady et al. 1980). A strong alliance is perceived as important for increasing the client's motivation and fostering engagement with the CBT techniques. One of the analogies used to demonstrate the role of alliance in treatment is that of anaesthesia during surgery, where various surgical procedures require using appropriate levels of anaesthesia (Rau and Goldfried 1994). These classic writings on the role of alliance in CBT referred mainly to alliance as the context in which the use of techniques can be effective, rather than perceiving it as curative in itself. One way of referring to this role of alliance in treatment is as a *trait-like* characteristic of the client or of the client-therapist dyad.

When the client has the interpersonal skills and resources needed to form a sufficiently good alliance, a strong trait-like alliance is likely to be established and to enable the effective use of techniques (Zilcha-Mano 2016).

Over the years, other roles of the alliance in treatment have been suggested. Contemporary writings on the role of alliance in CBT list specific techniques that integrate alliance as an essential interpersonal factor that produces therapeutic change (Castonguay et al. 2010). According to recent literature, alliance can serve as a direct path to changing the client's interpersonal expectations, cognitions, and behaviors. It has been suggested that it is not infrequent for clients' maladaptive interpersonal schemas, which made them seek therapy in the first place, to manifest in the alliance with the therapist. Often, behaviors related to client-therapist interactions can be viewed as samples of behavior of the clients themselves, likely of great relevance to the ways in which the clients behave outside the therapy room (Castonguay et al. 2010). By identifying ruptures in the alliance, the therapist may observe certain difficulties that clients have during the in-session interaction, and work collaboratively with the clients to understand and resolve them (Safran and Muran 2000). Techniques developed by Safran and Muran to identify ruptures in the therapeutic alliance and to resolve them received much empirical attention (Safran et al. 2011). Such resolutions can lead to the clients acquiring skills that they can later implement in interpersonal relationships outside the therapy room. Preliminary evidence in the literature suggest that therapists' use of techniques to identify and resolve ruptures contributes significantly to treatment outcome (Castonguay et al. 2004; Constantino et al. 2008; Safran et al. 2011), to foster clients' ability to engage in treatment (Muran et al. 2005) and form strong alliances (Constantino et al. 2008), and even to result in greater interpersonal adaptive behavior in clients (Constantino et al. 2008; Safran and Kraus 2014). Although these findings are based largely on randomizing clients to conditions in which therapists are either required or not to use specific alliance-fostering techniques (e.g., Constantino et al. 2008; Muran et al. 2005), no causal relationship can be established between fostering alliance and outcome. This contemporary work focuses on alliance as a curative factor in treatment, which can be defined as a *state-like* aspect of the alliance effect on outcome, where specific strengthening of alliance in the course of treatment directly and uniquely contributes to treatment outcome. State-like changes in alliance as a curative factor may be conceptualized as in vivo intervention (Goldfried 1985) and as creating an in-session corrective experience (Hill et al. 2012).

In sum, integrating classical and contemporary writings on the role of alliance in CBT treatments, two essential roles of alliance in CBT can be identified: (a) alliance as a trait-like characteristic, a function that highlights its role

as an indirect contributor to treatment success, providing a facilitative context for the implementation of CBT techniques, and (b) alliance as a state-like characteristic. The latter function highlights the role of alliance as a direct contributor to treatment success, acting as a vehicle for promoting therapeutic learning of the negotiation of interpersonal needs, based on the clients' ability to recognize their maladaptive schemas of relating to others and to change them to more adaptive ones (Safran and Muran 2000). Both characteristics may be important for treatment success, but trait-like characteristics may have a significant effect on treatment outcomes for many clients, and state-like characteristics may have a significant effect for some but not others. As part of the progress toward personalized treatment (DeRubeis et al. 2014) and toward making alliance an evidence-based active ingredient in effective treatment, it is important to identify empirically supported guidelines for therapists for using alliance in a way that is tailored to specific client characteristics and needs (Cronin et al. 2015). It is possible to devise such guidelines by identifying moderators of the alliance-outcome association (Lorenzo-Luaces et al. 2014, 2017), especially of the trait-like and state-like effects of alliance on outcome.

Recently it has been suggested that one way of disentangling the trait-like and state-like effects of alliance on outcome is by statistically disaggregating the between-clients from the within-client effects of alliance on outcome. In this way, the between-clients effect represents individual differences in the clients' general tendency to form a strong alliance (the trait-like effect of alliance on outcome), and the within-client effect represent the effects of changes in alliance (from the clients' general tendency to form a strong alliance) on treatment outcome (the state-like effect) (Zilcha-Mano 2017). It seems that the next step is to identify significant moderators to determine when each of these two components of alliance predict treatment outcome. Earlier findings on the effect of alliance on outcome have stated that alliance predicts outcome across populations, time, circumstances, and treatment orientations, but recent findings, based on advanced statistical methods and on session-by-session assessments of alliance and outcome, paint a more complex picture. Several recent studies suggest that early alliance may no longer predict outcome when accounting for the temporal relationships between alliance and symptomatic levels (Sasso et al. 2015; Strunk et al. 2010) and for therapist's use of Socratic questioning (Braun et al. 2015). Nor is alliance a significant predictor of outcome across treatment when controlling for improvement in coping skills (although it interacts with improvement in coping skills to predict outcome, Rubel et al. 2017). Other recent studies have shown that in CBT, within-client changes in alliance significantly predicted treatment outcome, even when accounting for the temporal relationship between

alliance and outcome (Connors et al. 2016; Falkenström et al. 2016; Zilcha-Mano et al. 2016). The mixed results reported in the literature may suggest a need to find significant moderators that can identify those for whom the trait-like and state-like components of alliance predict outcome in CBT.

A potential moderator of the effect of alliance on outcome, at both trait- and state-like levels, is the client's interpersonal characteristics. From a theoretical perspective, it is reasonable to expect that the same maladaptive schemas and automatic dysfunctional thoughts about relationships that affect the client's ability to form satisfying relationships with others also affect the client's relationship with the therapist. Specifically, it is not infrequent for clients' maladaptive interpersonal schemas, which caused them to seek therapy in the first place, to also manifest in the alliance with the therapist (Cronin et al. 2015). Behaviors related to client-therapist interactions can often be viewed as samples of client behavior in general, and are likely to be of great relevance to the ways in which clients behave outside the therapy room (Castonguay et al. 2010). By identifying ruptures in the alliance, the therapist may observe certain difficulties that clients have during in-session interaction, and work collaboratively with the clients to understand and resolve them (Safran and Muran 2000). There is also empirical support in the literature for focusing on interpersonal client characteristics as potential moderators. Such characteristics have been found to significantly predict the working alliance (e.g., Zilcha-Mano et al. 2014). Interpersonal problems have also been found to moderate the association between the state-like component of the alliance and outcome in several recent studies (Zilcha-Mano and Errázuriz 2017; Falkenström et al. 2013).

In the present study, we searched for the most robust moderators of the between- and within-client alliance effects on outcome in a sample of clients receiving CBT treatment. We aimed at identifying interpersonal markers indicating the extent to which the trait-like and state-like components of alliance affect outcome for specific subpopulations of clients. For each client, we collected data regarding two perspectives on interpersonal problems: the clients' own report before treatment concerning their interpersonal problems, and their therapist's report on their interpersonal problems early in treatment. Integrating theoretical conceptualizations of the importance of interpersonal markers and of the two potential roles of alliance in CBT treatments with data-driven machine-learning methods, we sought to contribute innovative and at the same time theoretically grounded information on the ways to achieve alliance-focused work tailored to the needs of individual clients.

Based on theory and on empirical studies, we theorized that focusing on CBT treatment may be highly productive

in searching for within-client and between-clients moderators of the effect of alliance on outcome. Contrary to therapies, such as AFT, in which techniques focusing on alliance strengthening are at the heart of the treatment (Muran et al. 2005, see also; Constantino et al. 2008), in CBT, therapists need to make a clinical decision about when to spend time and effort on techniques to strengthen the alliance. Therapists must repair dramatic ruptures to facilitate a successful course of treatment. But most ruptures in treatment are not dramatic, and when the therapist encounters a minimal rupture in a CBT therapy, an important clinical question arises: continue implementing the treatment techniques and hope that the minimal rupture will not diminish the effectiveness of the clinical work, or that implementation of the treatment techniques will also resolve the rupture (as, for example, when the client argues that the treatment is not effective enough), or stop adhering to the manual and begin using techniques to repair the rupture. Developing evidence-based decision rules for these instances is of great clinical importance.

## Methods

### Participants

Participating in this study were 185 clients receiving CBT from a trial comparing CBT with alliance-focused therapy (AFT), at a large metropolitan medical center in New York City. Some overlaps exist between the current sample and the one used in a previous publication on alliance, which included 108 clients receiving CBT (Zilcha-Mano et al. 2016). The study was approved by the institutional review board of the relevant institution. Clients were excluded from the trial for not meeting the following inclusion criteria: (a) 18–65 years old, and (b) English fluency, or for meeting the following exclusion criteria: (a) evidence of organic brain syndrome or mental retardation, (b) evidence of psychosis or need for hospitalization, (c) diagnosis of severe major depression<sup>1</sup> or bipolar disorder, (d) evidence of active substance abuse, (f) evidence of active Axis III medical diagnosis, (g) history of violent behavior or impulse control problems, and (h) evidence of active suicidal behavior. Mean age was 40.51 ( $SD = 14.19$ ), and 128 participants (69.6%) were female. One hundred and thirty-eight (77.5%) were white, 9.6% black, 8.4% Hispanic, and 4.5% chose the “other” category or did not answer this question. At intake, 46.9% met criteria for a primary diagnosis of mood disorder, 35.3% for anxiety disorders, 1.8%

<sup>1</sup> Severe major depression was diagnosed using the Structured Interview for DSM-IV-Axis I.

for adjustment disorder. Half of the clients (51.3%) had a primary Axis-II personality disorder. The most frequent personality disorders were obsessive–compulsive (11.9%), avoidant (9.2%), and not otherwise specified (16.8%). Of the clients, 66.1% were single, 24.4% married or remarried, 8.3% divorced or separated, and 1.1% widowed; 0.6% had some high-school education, 1.1% were high-school graduates, 12.7% had some college education, 43.1% were college graduates, 8.3% had some post-graduate education, and 34.3% had graduate degrees. One hundred and forty clients (75.7%) were employed, 18.4% unemployed, and 4.3% retired.

### Therapists

One hundred and fifty-two therapists participated in the study and had at least one treatment that was included in the data analyses. Mean clinical experience was 2 years ( $SD=1.75$ ), mean age was 30 ( $SD=4.42$ ), and 71.2% were women. Most of the therapists (75.4%) were White, and the rest were Latinos (10.2%), Asian (6.8%), Black (1.7%), or “other” (5.9%). The mean number of clients treated by each therapist in the current study was 1.21 ( $SD=0.49$ ; range 1–3). Before being assigned a case, all trainees participated in an orientation seminar of six 1-h lectures that provided an introduction to the theory, technique, and case formulation of CBT treatment. Each trainee was then assigned a case screened for admission, and began attending a weekly 90-min group supervision seminar. Each seminar was conducted by two senior supervisors with extensive experience in supervising CBT treatments. Group supervision sessions made extensive use of videotaped sessions for feedback.

### Treatments

The treatment was manualized and designed to treat clients in a fixed, 30-session, one-session-per-week format (for the manual, see Turner and Muran 1992). The treatment focused on symptom reduction and schema change. The cognitive-behavioral strategies used included self-monitoring, cognitive restructuring, behavioral exercises, and experimentation. All psychotherapy sessions were videotaped.

### Measures

#### *Working Alliance*

The quality of the working alliance was assessed with the 12-item client version of the Working Alliance Inventory (WAI; Tracey and Kokotovic 1989), repeatedly after each session. Items were rated on a 7-point Likert scale, ranging

from 1 (never) to 7 (always). In the present study, mean alliance rating ranged between 1.36 and 7.

#### *Outcome*

As a measure of session outcome, the *one-item session outcome* (Muran et al. 1992) measure was used repeatedly after each session, for 30 weekly sessions. We used a single item to accommodate the time constraints of clients and therapists and to minimize self-report burnout. Although single-variable measures are not infrequent, especially in the case of extensive session-by-session assessments, such measures are less desirable for a variety of reasons. This is especially the case with heterogeneous populations of clients, who present a variety of symptoms and of symptom severities (Loo 2002). Clients answered the one item (“To what extent are your presenting problems resolved?”) on a Likert scale, ranging from 1 (not at all) to 9 (completely). In the present study, rating ranged between 1 and 9. In several fields of research, the equivalence of one item over a full scale has been repeatedly demonstrated (e.g., Bergkvist and Rossiter 2007; Gardner et al. 1998; Robins et al. 2001). The validity of session outcome vs. overall treatment outcome was tested using the association between the slope of change in overall treatment outcome from pre-treatment to post-treatment (as assessed by the Global Severity Index (GSI) of the *Symptom Checklist-90-Revised*; SCL-90-R; Derogatis, 1983), and the slope of change in session outcome, as reported by clients repeatedly over the course of treatment. Analysis yielded a significant high correlation (Zilcha-Mano 2016). The relatively high correlation between the session outcome measure and the overall treatment outcome measure supports the validity of the session outcome.

#### *Interpersonal Problems*

Interpersonal problems were assessed using the inventory of Interpersonal Problems Circumplex (IIP-C). The IIP-C (Alden et al. 1990; Horowitz et al. 2000, 1988) short form is a 32-item self-report questionnaire assessing interpersonal difficulties and distress. Clients rate two types of items: interpersonal behaviors that are “hard for you to do” (e.g., “it is hard for me to let other people know when I am angry”) and interpersonal behaviors that “you do too much” (e.g., “I try to please other people too much”). Respondents rate the degree to which each problem is distressing on a 5-point scale ranging from 0 (not at all) to 4 (extremely). In addition to clients’ self-report at intake, their therapists reported on their clients’ interpersonal problems using the same questionnaire at week 3, adding the following instructions: “Please read the list below, and for each item, consider whether that item has been a problem for your client”.

## Diagnosis

The diagnostic status of each client was assessed pre-treatment using the Structured Interview for DSM-IV-Axis I & II (SCID: First et al. 1997). The SCID is a semi-structured interview used to determine Axis I and Axis II DSM-IV diagnoses (APA 2013).

## Procedure

After describing the study to the clients, written informed consent was obtained. Clients completed the IIP before starting treatment. Therapists completed the IIP on the client at week 3 of treatment. Session outcome and working alliance ratings were collected at every session. Clients were informed that their therapists would not have access to their responses. The mean length of treatment in the present study was 21.92 sessions ( $SD = 10.67$ ,  $Mdn = 29$ ). Further details on the design and procedures used are provided elsewhere (Muran 2002; Muran et al. 2005).

## Treatment Fidelity

We used the CBT observer-rated Beth Israel Fidelity Scale (BIFS) to assess the extent to which therapists conducted the treatment in accordance with the manual. Studies have found that the BIFS showed sound psychometric properties, including adequate internal consistency, interrater reliability, and discriminant validity (Patton et al. 1998; Santangelo et al. 1994). In the present study, we used the CBT scale (12 items assessing CBT interventions) and the Alliance Focused Treatment scale (12 items assessing AFT interventions). Each CBT session that was randomly chosen to assess fidelity was coded using both scales. Research assistants were trained to meet reliable standards (i.e., intraclass correlation  $>.90$ ) in conducting the assessment. Sessions were coded by two coders, and the data were used to compute intraclass correlations (ICC) as an estimate of interrater reliability. Thirty-six CBT cases were randomly sampled to evaluate treatment fidelity. We conducted a t-test to examine differences in scale scores within each of the two treatments. Findings show that CBT therapists showed significantly higher ratings on the CBT than on the AFT scale [ $t_{(35)} = 15.72$ ,  $p < .0001$ ]. Findings demonstrate adequate levels of treatment fidelity.

## Data Analysis

The data were hierarchically nested: sessions within clients, clients within therapists. To account for this non-independence of the data and to prevent inflation of the effects (Krull and MacKinnon 2001; Laurenceau and Bolger 2012), we used the SAS PROC MIXED procedure

(Littell et al. 2006), with level 1 as the session level, level 2 as the client level, and level 3 as clients of the same therapist. To examine session outcome behavior over time, we evaluated the following trend models for each: linear, quadratic, linear in log of time, and stability over time either as fixed or random effects. We started with a model with only a fixed intercept and no random effects, and added sequentially a random intercept, fixed effect of week, random effect of week, and a quadratic effect of week in therapy. Next, we examined the models with fixed and random linear effect of log of week. We used the log likelihood test and the AIC criterion to determine whether the inclusion of each term improved the model fit.

To disentangle the between-clients from within-client effect of alliance on outcome, following the recommendations of Wang and Maxwell (2015), we centered the client-reported alliance within the individual client's mean and used the individual client's mean for client-reported alliance for the between-clients effects. This procedure yielded independent coefficients for within-client and between-clients effects (Bolger and Laurenceau 2013). Using this approach to disaggregate the within- and between-clients components of alliance, we examined the two alliance components simultaneously as predictors, in a combined model.

Given the different natures of the within-client and between-clients data, we used different methods to search for the most robust moderators of each. To identify the most robust moderators of the within-client alliance-outcome association, we conducted decision tree analyses (Hothorn et al. 2006) with the “ctree” function of the R “party” package (Hothorn et al. 2006), using the individual alliance slopes obtained by the multilevel model, described above. The analysis was based on a unified framework of permutation tests, developed by Strasser and Weber (1999). The stop criterion is derived from multiplicity adjusted  $p$  values, using a Bonferroni correction with a total Type 1 error of 0.05 (Strasser and Weber 1999). The unified framework of permutation tests, developed by Strasser and Weber (1999), provides proof of validity for a non-parametric class of regression trees embedding tree-structured regression models.<sup>2</sup> We used

<sup>2</sup> Conditional inference trees estimate a regression relationship by binary recursive partitioning within a conditional inference framework. The algorithm operates as follows: (a) test the global null hypothesis of independence between any of the predictors and the outcome; stop if this hypothesis cannot be rejected, otherwise select the input variable with the strongest association with the outcome; this association is measured by a  $p$  value corresponding to a test for the partial null hypothesis of a single predictor and of the response; (b) implement a binary split in the selected predictor; (c) recursively repeat steps (a) and (b).

the following baseline characteristics as potential moderators: client-reported IIP subscales and total score, therapist-reported IIP subscales and total score,<sup>3</sup> and a categorical variable of the presence of a personality disorders diagnosis for the client (present vs. absent). For the chosen decision tree, we used the Wilcoxon signed rank test to examine for each group whether the ability of alliance to predict outcome was significantly different from zero and from the other groups. To search for the moderators of the between-clients alliance-outcome association, we conducted decision tree analyses, applying the “mob” function of the R “party” package (Zeileis et al. 2008). The analysis uses model-based recursive partitioning, fitting the best partitioning by M-fluctuation tests ( $M_f$ ) for a given linear relationship, and providing a linear regression solution for each node of the final model.

## Results

We compared the fits of several models of change over time for the outcome variable. We found that the best fit based on the Akaike Information Criterion (AIC) for the outcome variable was the model with a fixed effect of log of time, random intercept, and random slope in log of time.

### Therapist’s and Client’s Random Effect

The estimated variance of the therapist’s random effect in the three-level model predicting outcome was null,  $S^2=0.00$ ,  $p=.99$ ,  $ICC=0.00$ . The estimated variance of the client’s random effect in the three-level model predicting outcome was significant, indicating that the client’s random effects contributed significantly to the variance in outcome;  $p<.0001$ ,  $S^2=0.99$ ,  $ICC=63.31$ .

### Alliance Effect on Outcome

The effect of between-clients alliance on outcome was significant,  $\beta=0.90$ ,  $SE=0.14$ ,  $p<.0001$ , indicating that clients who generally report better alliance also report better outcome. For the between-clients effect of alliance on outcome, the standardized coefficient of the effect was

0.42, which means that an increase of one standard deviation in the between-clients WAI correlates with an average increase of 0.42 standard deviation in outcome, beyond the reduction resulting from the change in time. The within-client alliance effect was also significant,  $\beta=0.71$ ,  $SE=0.04$ ,  $p<.0001$ , indicating that clients who report improvement relative to their expected level of alliance are more likely to report better outcome. The within-client WAI standardized coefficient was 0.20, which means that an increase of one standard deviation in the within-client WAI predicted an average increase of 0.20 standard deviation in outcome, beyond the reduction resulting from the change in time. Findings were similar when we entered pre-treatment symptom severity (as measured by the SCL) into the analyses as a covariate. We repeated the analyses to examine the ability of the lagged within-client WAI to predict subsequent treatment outcome. The analysis revealed that the lagged within-client WAI was a significant predictor of subsequent outcome,  $\beta=0.68$ ,  $SE=0.05$ ,  $p<.0001$ . The equation was:

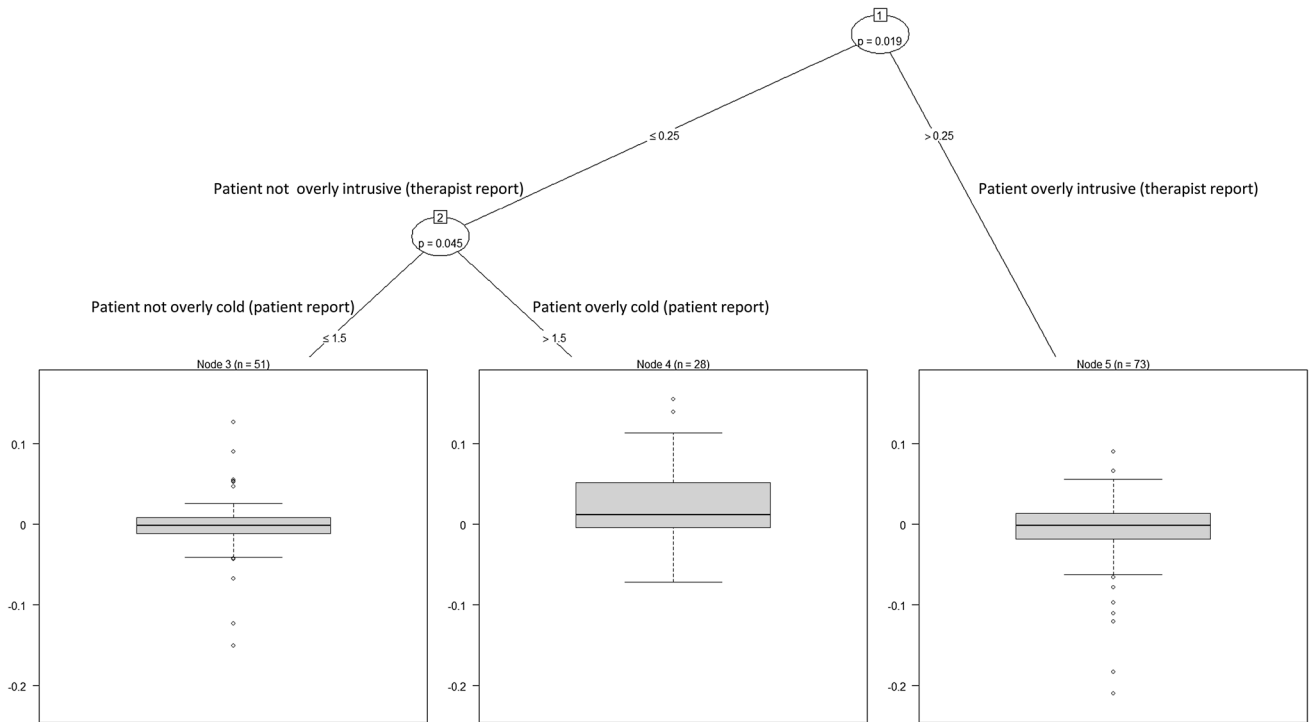
$$\begin{aligned} \text{Outcome}_{ij(t)} = & b_0 + (b_1 + u_{1_i}) \times \log_{(t)} + b_2 \\ & \times \text{WAI}_{\text{within-client}(t-1)} + b_3 \\ & \times \text{WAI}_{\text{between-clients}} + u_{2_i} + u_{3_j} + e_{_i} \end{aligned}$$

where  $u_{1_i}$  and  $u_{2_i}$  are random effects of slope and intercept of client  $i$ ,  $u_{3_j}$  is the random effect of therapist  $j$  (who treated client  $i$ ), and  $e_{_i}$  is the random error. All random effects are normally distributed and independent.

### Moderators of the Within-Client Alliance Effect on Outcome

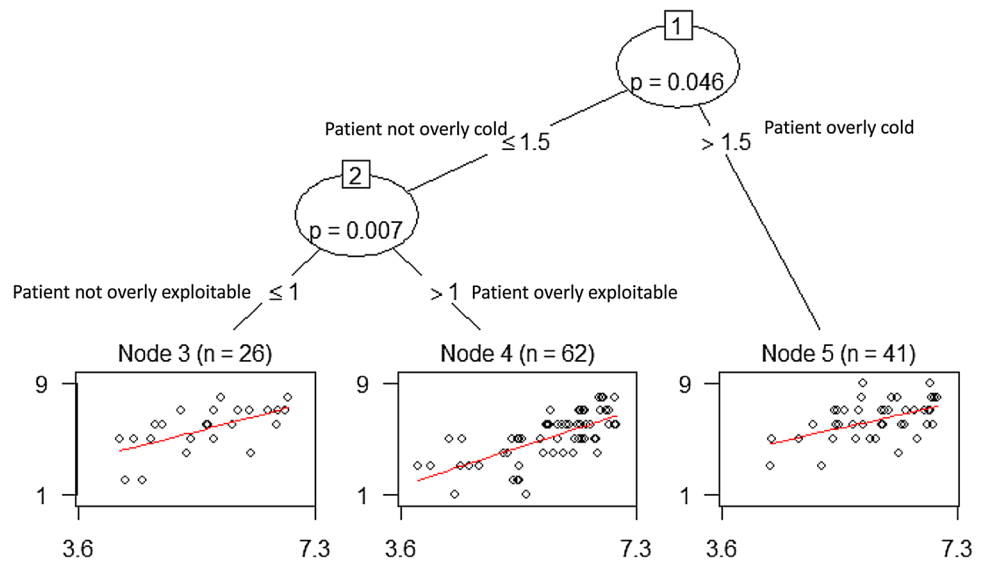
The tree decision analysis revealed a significant first split in therapists’ reported level of intrusiveness [ $\chi^2_{(1)}=5.49$ ,  $p=.02$ ] and a second split in clients’ reported level of coldness [ $\chi^2_{(1)}=4.22$ ,  $p=.04$ ]. Figure 1 presents the tree for the moderators of the within-client alliance effect on outcome. A Wilcoxon signed rank test for one sample (comparing to 0) showed a significant ability of within-client alliance to predict outcome for clients who are reported by their therapists to show low levels of intrusiveness in interpersonal relationships and are reported by themselves to be overly cold ( $V=243$ ,  $p=.014$ ). For clients who were reported by their therapists to be overly intrusive or those who were reported by their therapists not to be overly intrusive and were reported by themselves not to be overly cold, the within-client alliance was not a significant predictor of outcome ( $V=585$ ,  $p=.51$  and  $V=1436$ ,  $p=.76$ , respectively). The Kruskal–Wallis test revealed significant differences between the groups [ $\chi^2(2)=7.32$ ,  $p=.03$ ], such that the

<sup>3</sup> Because the average correlation within the total score and the subscales was 0.37, the statistical methods used to search for moderators enabled us to introduce both the total and the subscale scores. Conceptually, the total score and the subscales represent distinct types of information regarding the client’s interpersonal tendencies and difficulties. The total score represents the client’s degree of interpersonal distress, whereas the subscales represent the nature of the client’s interpersonal problems, identifying the client’s specific area of interpersonal difficulty (Horowitz et al. 2000). We conducted a sensitivity analysis without the total score and obtained the same findings.



**Fig. 1** Moderators of the within-patient effect of alliance on outcome

**Fig. 2** Moderators of the between-patient effect of alliance on outcome



group of clients reported by their therapists not to be overly intrusive and at the same time reported on themselves that they are overly cold was significantly different from that of overly intrusive clients (as reported by their therapists) ( $W = 1287, p = .01$ ) and from that of clients whose therapists saw them as not overly intrusive and they saw themselves as not overly cold ( $W = 430, p = .02$ ).

**Moderators of the Between-Clients Alliance Effect on Outcome**

The tree decision analysis revealed a significant first split in clients' level of coldness ( $M_f = 11.37, p = .04$ ), and a second split in clients' level of exploitableness ( $M_f = 14.90, p = .007$ ). Figure 2 presents the tree for the moderators of the between-client alliance effect on outcome. Although the

between-clients alliance effect on outcome was stronger for the subset of clients who described themselves as not overly cold and as overly exploitable, it was still significant for all the three subsets ( $B=1.49$ ,  $SE=0.20$ ,  $p<.0001$ ,  $B=1.18$ ,  $SE=0.29$ ,  $p<.0001$  and  $B=1.01$ ,  $SE=0.27$ ,  $p=.0005$ , for clients who described themselves as not overly cold and as overly exploitable, those who described themselves as not overly cold and as not overly exploitable, and those who described themselves as overly cold, respectively).<sup>4</sup>

## Discussion

The working alliance is one of the most consistent predictors of outcome in CBT as well as other therapies. The literature on the role of the working alliance in CBT can be generally divided into writings that refer to the alliance as the necessary context within which to use therapeutic techniques (the trait-like component of alliance), and those that refer to the alliance as therapeutic in itself and as in vivo opportunity to work on interpersonal problems (the state-like component of alliance). We argue that whereas for many clients a steady good alliance is a precondition for therapy to work, for some clients improvement in alliance over the course of therapy is an important factor contributing to a good outcome. To advance toward an evidence-based tailoring of the work on the alliance to individual client characteristics and needs, we sought to identify the most robust moderators of the effects of the trait-like and state-like components of alliance on outcome.

The findings suggest that at the sample level both the between-clients (trait-like) and the within-clients (state-like) alliance components were significant predictors of outcome. Clients who generally report better trait-like alliance also report better outcome. This finding supports the role of strong alliance as the context in which therapeutic work can be carried out, so that trait-like individual differences between clients (or dyads) in their tendency to form strong alliance are associated with individual differences in outcome. This finding is consistent with previous studies showing a significant association between the trait-like component of alliance and outcome (e.g., Rubel et al. 2017; Zilcha-Mano et al. 2016). Furthermore, clients who report improvement in alliance relative to their expected level of alliance were found to

be more likely to report better outcome. This finding supports the role of changes in alliance as an active ingredient in bringing about therapeutic change; thus, supporting the role of alliance as therapeutic in itself. The finding about the ability of the state-like component of alliance to predict outcome is also consistent with previous studies (Falkenström et al. 2013, 2016; Zilcha-Mano et al. 2015).

Importantly, whereas at the sample level both the trait-like and state-like components contributed significantly to treatment outcome, there was a specific subset of clients for whom the trait-like alliance was a stronger predictor of outcome, and specific subsets for whom it was less so. The same was true regarding the state-like component of the alliance, which was a significant predictor of outcome for a subset of clients, but not for others. Identification based on intake assessment of clients for whom each component contributes to outcome is of great importance in the progress toward client-tailored alliance work.

The analysis for identifying specific moderators of the trait-like alliance effect on outcome reveals that although the between-clients alliance had a significant effect on outcome for the all sample, it had a stronger effect on outcome for the subset of clients who described themselves as not overly cold and as overly exploitable. For these clients, the alliance may function as an important context, that if absent—the treatment is less likely to be effective. Clients who rank high on the exploitable scale of the IIP generally tend to invest much effort in trying to be inoffensive, please other people, and win their approval. They tend to be reluctant to say “no” to other people, and are loath to express or even feel anger, lest they incur another person’s hostility or retaliation. They tend to describe themselves as obliging, accommodating, and deferential, and report being easily taken advantage of by others and too gullible. They also tend to report having difficulties expressing disagreement with others. The combination with low levels of interpersonal coldness (characterized as “a lone wolf,” low on interpersonal warmth, and enjoying freedom from social demands), placed these individuals even further in the friendly submissive quarter (Horowitz et al. 2000).

One way to explain this finding is that individuals who are greatly concerned with not being approved by others, when the relationship with the therapist does not score high on the working alliance, feel so much stress that they find it difficult to benefit from treatment; consequently, a poor alliance has detrimental effect on the chances of treatment to be successful. Even more than others, these individuals may need to feel cared for by their therapists and to be in agreement with their therapists on the tasks and goals of treatment. They need to achieve a safe haven and secure base in treatment to truly participate in it and engage in the techniques used by the therapists (Bowlby 1988).

<sup>4</sup> In a post hoc analysis, we examined the ability of the interaction between overly cold and overly exploitable pre-treatment characteristics to directly affect treatment outcome (rather than affect the association between the trait-like component of alliance and outcome). The analysis revealed that the interaction between overly cold and overly exploitable characteristics failed to significantly predict outcome [ $F_{(1,3017)}=0.5$ ,  $p=.47$ ].



Another potential explanation concerns the high levels of social desirability characterizing these clients, which may affect both their tendencies not to report difficulties in the alliance and to report that they have benefited from the treatment. This potential explanation receives support from the fact that by disentangling the within- and between-clients alliance effect on outcome we are able to disaggregate the general trait-like tendency of individuals in their reporting from the specific dynamic of the state-like alliance, throughout the treatment (Falkenström et al. 2016; Zilcha-Mano 2016). This separation enables us to focus on the general tendencies of the client when identify between-clients moderators of alliance. This post hoc interpretation is consistent with previous studies suggesting that clients with non-assertive or friendly-submissive interpersonal problems seem more inclined to agree with the parameters of their treatment. Specifically, clients with high levels of exploitable interpersonal characteristics reported stronger alliances (Muran et al. 1994). Muran et al. (1994) suggested that the association between strong alliance and high levels of exploitableness and other friendly-submissive characteristics may represent compliance rather than a genuine therapeutic aspect of the working alliance. If replicated in future studies, the current findings, combined with those of Muran et al., attest to the importance of disentangling potential curative state-like aspects of the alliance from trait-like individual differences, such as compliance, to identify the mechanisms at the basis of therapeutic change (see also Falkenström et al. 2016; Rubel et al. 2017; Sasso et al. 2015; Zilcha-Mano 2017).

A third potential post hoc explanation may suggest that clients who are not overly cold and are overly exploitable have a difficult time expressing disagreement with people in general, and will also have a difficult time disagreeing openly with their therapists. It is therefore less likely that the therapists will be able to notice ruptures in the alliance, and therefore therapists less likely to use techniques to resolve the ruptures. Thus, for these clients, the trait-like alliance may have a more prominent effect on outcome.

In addition to identifying moderators of the between-client alliance effect on outcome, the present study also focused on identifying moderators of the within-client alliance effect on outcome, which may answer the question “for whom may the alliance be curative in itself?”. The analysis for identifying specific moderators of the state-like alliance effect on outcome reveals that the within-client alliance had a significant effect on outcome only for the subset of clients who described themselves as overly cold, and who at the same time were described by their therapists as low on intrusiveness. For this subset of clients, the alliance functioned as an active ingredient in treatment, such that changes in alliance translated into changes in outcome.

One post hoc explanation for the finding regarding the within-client moderating effect of alliance rests on the discrepancy between therapist and client report. Specifically, clients who generally score high on the cold subscale of the IIP tend to report minimal feelings of affection for other people and little connection with them. They tend not to feel close to or loving toward others, and they may find it difficult to make and maintain long-term commitments to other people (Horowitz et al. 2000). Whereas the clients reported considering themselves as not needing other people, according to their therapists, their problem was that they did not express their interpersonal needs to others, and not that they did not have any. It may be suggested that the therapists of these clients were able to recognize early in the treatment (by the third session) interpersonal needs that the clients did not recognize in themselves, or had problems to be in emotional contact with (Greenberg and Paivio 2003). Although we did not assess the therapists’ actions, it is reasonable to speculate that the therapists may have helped these clients recognize these needs in themselves.

The present study has several important advantages: (a) integration of theoretical conceptualization with advanced data-driven methods, which increases the chance that the findings can be replicated outside the current sample (in the present study, we used systematic exploratory analyses to expand our understanding of which pre-treatment client characteristics influence the alliance-outcome association; to increase the likelihood that these relationships will be replicated out-of-sample, we made predictions with leave-one-out cross-validation); (b) assessments of alliance and session outcome on a weekly basis; and (c) measuring not only the clients’ report on their interpersonal qualities but also the therapist’s clinical evaluation of the clients interpersonal characteristics. Another advantage of the present study is that it examined several qualitatively distinct types of interpersonal styles, rather than using one continuous score of the degree of interpersonal problems. In fact, the total IIP scores of both therapist and client reports were introduced into the model but were not identified as robust predictors. The present findings are consistent with previous studies suggesting that it is important to look at specific interpersonal problems rather than considering all interpersonal problems as the same and as having the same effect on alliance, outcome and the alliance-outcome association. For example, Muran et al. (1994) demonstrated that some interpersonal problems may be more detrimental to establishing a strong therapeutic alliance than others, and that the statistical effects of distinct interpersonal characteristics may even move in opposite directions.

The present findings, if replicated in future prospective studies, have important implications for clinical practice. The findings can guide clinicians in the process of clinical decision making when a general, good enough alliance

is sufficient for treatment success (alliance as a necessary context for the effective use of techniques), and when any increase in alliance deserves the investment of effort because it translates into better outcome (alliance as therapeutic in itself). When encountering a dramatic rupture, the therapists must repair it to facilitate a successful course of treatment. But most ruptures in treatment are not dramatic, and when the therapist encounters a minimal rupture in a CBT therapy, an important clinical question arises: whether to try to continue implementing the treatment techniques and hope that the minimal rupture will not affect the effectiveness of the clinical work, or stop to adhere to the manual and begin using techniques to repair the rupture (Castonguay 1996; Safran and Muran 2000). For example, when reviewing the homework for the next session, a client with a narcissistic personality disorder may acquiesce in doing the homework but at the same time express discomfort with the therapist telling him what to do, and feel controlled by the therapist. Should the therapists continue to adhere to the manual and implement the relevant techniques, or start implementing techniques to resolve the rupture? The answer to this type of question, although frequently encountered in clinical practice, is based mostly on clinical intuition and rarely on empirical findings. The present findings have the potential to guide clinical decision making in answering such an important question. They may suggest, for example, that for clients reporting high levels of coldness in interpersonal relations when the therapist identifies that they are low on intrusiveness, work in treatment that focuses on strengthening the alliance and identifying each minimal rupture as an opportunity for interpersonal growth is highly effective. In this context, when encountering any minimal rupture, the therapist may be advised to consider the following (Safran and Muran 2000): first, be alert to recognize nuanced indications of ruptures, confrontational or withdrawal markers, when, for example, the client agrees with the therapist's suggestions in an acquiescent fashion; next, attend to the rupture and establish a focus on the in-session interactions, inviting clients to explore the expectations, automatic thoughts, and feelings toward the therapist that they have been avoiding. This may be done through an awareness experiment, in which the client directly expresses feelings that may be avoided, then attends to the feelings that are evoked by the experiment. As part of the collaborative nature of the relationship, therapists may also disclose their own perceptions of the situation (for an elaboration of repair techniques, see Safran and Muran 2000; and; Castonguay 1996).

The present findings should be considered in light of the study limitations. The same measure, the IIP, was used to assess distinct interpersonal problems, with low-to-moderate correlations between the subscales. Additionally, questions have been raised in the literature whether

the IIP measures interpersonal problems or dispositions (Alden et al. 1990). Future studies should use multiple measures, together with behavioral observations, and also consider examining the interpersonal characteristics of the therapists as we move toward evidence-supported matching of therapists with clients. Therapist evaluation of the client's interpersonal characteristics was conducted at week 3 of the treatment, which may already be "contaminated" by early treatment gains, and at the same time may also be partial because some characteristics of the client may not be entirely evident to the therapist at this early stage. Moreover, we used a single item to evaluate session outcome because of the large number of repeated extensive observations recorded for each client (for many clients we conducted 30 observations). Even though we found a strong association between session outcome and overall psychiatric symptom outcome (as measured by the SCL-90), which may suggest some inference between the two (Zilcha-Mano et al. 2016), multiple-item scales should be preferred, whenever feasible. Thus, future studies should use a full scale to measure treatment outcome after each session. It is important to note that although the trait-like component of the alliance does capture individual between-clients differences across treatment, it is an open question to which extent this component represents the trait-like characteristic of the client or the dyad (Mitchell 2000). Since each client in the study was treated by only one therapist, it is not possible to disentangle the dyad from the client variances, which remains a task for future studies (Zilcha-Mano 2017). Future studies should also identify proxies of between-clients alliance that can be evaluated early in treatment (Zilcha-Mano and Errázuriz 2017). It is an open question to which extent the present findings can be generalized to other treatments (e.g., whether in AFT only the identified subpopulation of clients benefit from state-like changes in alliance or can all clients benefit from it). Finally, although the rationale for the study and the focus on interpersonal characteristics of the client are theory-grounded, the identification of the most robust moderators was data-driven. Therefore, caution should be exercised (Kraemer et al. 2002), and prospective studies of client assignment are needed (DeRubeis et al. 2014).

The proposed conceptualization of the trait-like component of the alliance, as its ability to facilitate productive use of therapeutic techniques, and of the state-like component of the alliance, as therapeutic in itself, is only one way of interpreting the findings. As demonstrated by Rubel et al. (2017), the effect of state-like changes in alliance on outcome may be interpreted as the extent to which the alliance is strong enough to enable a competent use of techniques. In other words, according to the interpretation of the authors, the significant interaction

between state-like alliance and coping skills demonstrates the role of the alliance in enhancing the effect of the use of coping skills on outcome. Additionally, although there is likely to be a causal association between state-like alliance and subsequent outcome (Falkenström et al. 2016), which may be translated directly into clinical recommendations (Hoffart 2016; Rubel et al. 2017), the association between trait-like alliance and outcome is more likely to be a function of other client trait-like characteristics. For example, some clients may have a general predisposition or capability of forming good relationships with others, which may also manifest as good alliance with the therapist and serve as a predictor of treatment outcome itself (DeRubeis et al. 2005).

The present findings suggest that whereas alliance serves as an important context for therapeutic work for all clients, it serves as an active ingredient only for a specific subpopulation of clients in CBT treatments. Additionally, the extent to which alliance serves as a crucial context for effective implementation of CBT technique differs between subsets of clients. The findings contribute to the literature about the relevance of interpersonal factors in the etiology of psychopathology and its treatment (Wright et al. 2015; Greenberg and Mitchell 1983; Horowitz et al. 1988) and about the consistent association between alliance and outcome (Horvath et al. 2011). They seek to expand this literature by suggesting how the work of treatment may be maximized by progressing from a general empirical consensus about the importance of alliance toward client-tailored work that focuses on the alliance. The study highlights the importance of identifying client interpersonal characteristics that can guide clinical decision making on how to best use alliance in the treatment of individual clients. Such information is essential as researchers venture beyond the general understanding that alliance predicts outcome to the clarification of how to use alliance to improve treatment efficacy (Safran et al. 2011).

### Compliance with Ethical Standards

**Conflict of Interest** Sigal Zilcha-Mano, J. Christopher Muran, Catherine F. Eubanks, Jeremy D. Safran, and Arnold Winston, declare that they have no conflict of interest.

**Informed Consent** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

**Animal Rights** No animal studies were carried out by the authors for this article.

### References

- Alden, L. E., Wiggins, S., & Pincus, A. L. (1990). Construction of circumplex scales for the inventory of interpersonal problems. *Journal of Personality Assessment*, 55, 521–536.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Barber, J. P. (2009). Toward a working through of some core conflicts in psychotherapy research. *Psychotherapy Research*, 19(1), 1–12.
- Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. New York, NY: Guilford Publications.
- Bergkvist, L., & Rossiter, J. R. (2007). The predictive validity of multiple-item versus single-item measures of the same constructs. *Journal of Marketing Research*, 44(2), 175–184.
- Bolger, N., & Laurenceau, J. P. (2013). *Intensive longitudinal methods*. New York, NY: Guilford.
- Bordin, E. S. (1979). The generalizability of the psychoanalytic concept of the working alliance. *Psychotherapy: Theory, Research & Practice*, 16(3), 252.
- Bowlby, J. (1988). Attachment, communication, and the therapeutic process. In *A secure base: Parent-child attachment and healthy human development* (pp. 137–157). New York: Basic Books.
- Brady, J. P., Davison, G. C., Dewald, P. A., Egan, G., Fadiman, J., Frank, J. D., ... Strupp, H. H. (1980). Some views on effective principles of psychotherapy. *Cognitive Therapy and Research*, 4, 271–306.
- Braun, J. D., Strunk, D. R., Sasso, K. E., & Cooper, A. A. (2015). Therapist use of Socratic questioning predicts session-to-session symptom change in cognitive therapy for depression. *Behaviour Research and Therapy*, 70, 32–37. doi:10.1016/j.brat.2015.05.004.
- Castonguay, L. G. (1996). *Integrative cognitive therapy for depression treatment manual*. Pennsylvania: The Pennsylvania State University.
- Castonguay, L. G., Constantino, M. J., McAleavey, A. A., & Goldfried, M. R. (2010). The therapeutic alliance in cognitive-behavioral therapy. In J. C. Muran & J. P. Barber (Eds.), *The therapeutic alliance: An evidence-based guide to practice* (pp. 150–171). New York, NY: Guilford Press.
- Castonguay, L. G., Schut, A. J., Aikens, D. E., Constantino, M. J., Laurenceau, J. P., Bologh, L., & Burns, D. D. (2004). Integrative cognitive therapy for depression: A preliminary investigation. *Journal of Psychotherapy Integration*, 14(1), 4.
- Connors, G. J., Maisto, S. A., Schlauch, R. C., Dearing, R. L., Prince, M. A., & Duerr, M. R. (2016). Therapeutic alliances predict session by session drinking behavior in the treatment of alcohol use disorders. *Journal of Consulting and Clinical Psychology*, 84(11), 972–982.
- Constantino, M. J., Marnell, M. E., Haile, A. J., Kanther-Sista, S. N., Wolman, K., Zappert, L., & Arnow, B. A. (2008). Integrative cognitive therapy for depression: A randomized pilot comparison. *Psychotherapy: Theory, Research, Practice, Training*, 45(2), 122–134.
- Crits-Christoph, P., Gibbons, M. B. C., & Mukherjee, D. (2013). Psychotherapy process-outcome research. In M. J. Lambert (Ed.), *Bergin and Garfield's handbook of psychotherapy and behavior change* (pp. 298–340). New York NY: Wiley.
- Cronin, T. J., Lawrence, K. A., Taylor, K., Norton, P. J., & Kazantzis, N. (2015). Integrating between-session interventions (homework) in therapy: The importance of the therapeutic relationship and cognitive case conceptualization. *Journal of Clinical Psychology*, 71(5), 439–450.

- Derogatis, L. R. (1983). *Scl-90: Administration. Scoring and procedure manual-II for the revised version*, Tawson, Clinical Psychometric Research.
- DeRubeis, R. J., Brotman, M. A., & Gibbons, C. J. (2005). A conceptual and methodological analysis of the nonspecifics argument. *Clinical Psychology: Science and Practice*, 12(2), 174–183.
- DeRubeis, R. J., Cohen, Z. D., Forand, N. R., Fournier, J. C., Gelfand, L. A., & Lorenzo-Luaces, L. (2014). The personalized advantage index: translating research on prediction into individualized treatment recommendations. A demonstration. *PLoS ONE*, 9(1), e83875.
- Falkenström, F., Ekeblad, A., & Holmqvist, R. (2016). Improvement of the working alliance in one treatment session predicts improvement of depressive symptoms by the next session. *Journal of Consulting and Clinical Psychology*, 84(8), 738.
- Falkenström, F., Granström, F., & Holmqvist, R. (2013). Therapeutic alliance predicts symptomatic improvement session by session. *Journal of Counseling Psychology*, 60(3), 317.
- First, M. B., Gibbon, M., Spitzer, R. L., Williams, J. B. W., & Benjamin, L. S. (1997). *Structured clinical interview for DSM-IV axis I personality disorders, (SCID-I)*. Washington, D.C.: American Psychiatric Press.
- Gardner, D. G., Cummings, L. L., Dunham, R. B., & Pierce, J. L. (1998). Single-item versus multiple-item measurement scales: An empirical comparison. *Educational and Psychological Measurement*, 58(6), 898–915.
- Goldfried, M. R. (1985). A paradigm shift in cognitive behavior therapy?. *Psyccritiques*, 30(7), 560.
- Goldfried, M. R., & Davison, G. C. (1976). *Clinical behavior therapy*. Troy, MO: Holt, Rinehart & Winston.
- Greenberg, J. R., & Mitchell, S. A. (1983). *Object relations in psychoanalytic theory*. Cambridge, MA: Harvard University Press.
- Greenberg, L. S., & Paivio, S. C. (2003). *Working with emotions in psychotherapy*, (vol. 13). New York, NY: Guilford Press.
- Hill, C. E., Castonguay, L. G., Farber, B. A., Knox, S., Stiles, W. B., Anderson, T., ... Caspar, F. (2012). Corrective experiences in psychotherapy: Definitions, processes, consequences, and research directions. In L. G. Castonguay & C. E. Hill (Eds.), *Transformation in psychotherapy: Corrective experiences across cognitive-behavioral, humanistic, and psychodynamic approaches* (pp. 355–370). Washington, DC: American Psychological Association.
- Hoffart, A. (2016). Cognitive models for panic disorder with agoraphobia: A study of disaggregated within-person effects. *Journal of Consulting and Clinical Psychology*, 84(9). doi:10.1037/ccp0000114.
- Horowitz, L. M., Alden, L. E., Wiggins, J. S., & Pincus, A. L. (2000). *IIP, inventory of interpersonal problems manual*. New York, NY: The Psychological Corporation.
- Horowitz, L. M., Rosenberg, S. E., Baer, B. A., Ureño, G., & Villaseñor, V. S. (1988). Inventory of interpersonal problems: Psychometric properties and clinical applications. *Journal of Consulting and Clinical Psychology*, 56, 885–892.
- Horvath, A. O., Del Re, A., Flückiger, C., & Symonds, D. (2011). Alliance in individual psychotherapy. *Psychotherapy*, 48, 9–16. doi:10.1037/a0022186.
- Hothorn, T., Hornik, K., & Zeileis, A. (2006). Unbiased recursive partitioning: A conditional inference framework. *Journal of Computational and Graphical Statistics*, 15(3), 651–674.
- Kraemer, H. C., Wilson, G. T., Fairburn, C. G., & Agras, W. S. (2002). Mediators and moderators of treatment effects in randomized clinical trials. *Archives of General Psychiatry*, 59(10), 877–883.
- Krull, J. L., & MacKinnon, D. P. (2001). Multilevel modeling of individual and group level mediated effects. *Multivariate Behavioral Research*, 36(2), 249–277.
- Laurenceau, J., & Bolger, N. (2012). Analyzing diary and intensive longitudinal data from dyads. *Handbook of Research Methods for Studying Daily Life*, 1, 407–422.
- Littell, R. C., Milliken, G. A., Stroup, W. W., Wolfinger, R. D., & Schabenberger, O. (2006). *SAS for mixed models* (2nd ed.). Cary, NC: SAS Institute.
- Loo, R. (2002). A caveat on using single-item versus multiple-item scales. *Journal of Managerial Psychology*, 17(1), 68–75.
- Lorenzo-Luaces, L., DeRubeis, R. J., & Webb, C. A. (2014). Client characteristics as moderators of the relation between the therapeutic alliance and outcome in cognitive therapy for depression. *Journal of Consulting and Clinical Psychology*, 82(2), 368.
- Lorenzo-Luaces, L., Driessen, E., DeRubeis, R. J., Van, H. L., Keefe, J. R., Hendriksen, M., & Dekker, J. (2017). Moderation of the alliance-outcome association by prior depressive episodes: Differential effects in cognitive-behavioral therapy and short-term psychodynamic supportive psychotherapy. *Behavior Therapy*, 48(5), 581–595.
- Mitchell, S. A. (2000). *Relationality: From attachment to intersubjectivity*. Hillsdale, NJ: The Analytic Press.
- Muran, J. C. (2002). A relational approach to understanding change: Plurality and contextualism in a psychotherapy research program. *Psychotherapy Research*, 12(2), 113–138.
- Muran, J. C., Safran, J. D., Samstag, L. W., & Winston, A. (1992). *Patient and therapist postsession questionnaires, version 1992*. New York: Beth Israel Medical Center.
- Muran, J. C., Safran, J. D., Samstag, L. W., & Winston, A. (2005). Evaluating an alliance-focused treatment for personality disorders. *Psychotherapy: Theory, Research, Practice, Training*, 42(4), 532.
- Muran, J. C., Segal, Z. V., Samstag, L. W., & Crawford, C. E. (1994). Patient pretreatment interpersonal problems and therapeutic alliance in short-term cognitive therapy. *Journal of Consulting and Clinical Psychology*, 62(1), 185.
- Patton, M. J., Muran, J. C., Safran, J. D., Wachtel, P., & Winston, A. (1998). *Treatment fidelity measure for three brief psychotherapies*. New York: Beth Israel Center.
- Raue, P. J., & Goldfried, M. R. (1994). The therapeutic alliance in cognitive-behavior therapy. In A. O. Horvath & L. S. Greenberg (Eds.), *The working alliance: Theory, research, and practice* (pp. 131–152). New York, NY: Wiley.
- Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the Rosenberg Self-Esteem Scale. *Personality and Social Psychology Bulletin*, 27(2), 151–161.
- Rubel, J. A., Rosenbaum, D., & Lutz, W. (2017). Patients' in-session experiences and symptom change: Session-to-session effects on a within- and between-patient level. *Behaviour Research and Therapy*, 90, 58–66. doi:10.1016/j.brat.2016.12.007.
- Safran, J. D., & Kraus, J. (2014). Alliance ruptures, impasses, and enactments: A relational perspective. *Psychotherapy*, 51(3), 381.
- Safran, J. D., & Muran, J. C. (2000). *Negotiating the therapeutic alliance: A relational treatment guide*. New York, NY: Guilford Press.
- Safran, J. D., Muran, J. C., & Eubanks-Carter, C. (2011). Repairing alliance ruptures. *Psychotherapy*, 48(1), 80–87.
- Santangelo, C., Safran, J., Muran, J., & Winston, A. (1994). Adherence to manualized brief psychotherapy treatments. In *Poster presented at the annual meeting of the society for psychotherapy research*, Pittsburgh, PA.
- Sasso, K. E., Strunk, D. R., Braun, J. D., DeRubeis, R. J., & Brotman, M. A. (2015). Identifying moderators of the adherence-outcome relation in cognitive therapy for depression. *Journal of Consulting and Clinical Psychology*, 83(5), 976–984. doi:10.1037/ccp0000045.

- Strasser, H., & Weber, C. (1999). On the asymptotic theory of permutation statistics. *Mathematical Methods of Statistics*, 8, 220–250.
- Strunk, D. R., Brotman, M. A., & DeRubeis, R. J. (2010). The process of change in cognitive therapy for depression: Predictors of early inter-session symptom gains. *Behaviour Research and Therapy*, 48(7), 599–606.
- Tracey, T. J., & Kokotovic, A. M. (1989). Factor structure of the working alliance inventory. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, 1(3), 207.
- Turner, A. E., & Muran, J. C. (1992). *Cognitive-behavioral therapy for personality disorders: A treatment manual*. San Diego, CA: Social & Behavioral Documents.
- Wang, L. P., & Maxwell, S. E. (2015). On disaggregating between-person and within-person effects with longitudinal data using multilevel models. *Psychological Methods*, 20(1), 63.
- Wright, A. G., Hopwood, C. J., & Simms, L. J. (2015). Daily interpersonal and affective dynamics in personality disorder. *Journal of Personality Disorders*, 29(4), 503–525.
- Zeileis, A., Hothorn, T., & Hornik, K. (2008). Model-based recursive partitioning. *Journal of Computational and Graphical Statistics*, 17(2), 492–514.
- Zilcha-Mano, S. (2016). New analytic strategies help answer the controversial question of whether alliance is therapeutic in itself. *World Psychiatry*, 15(1), 84–85.
- Zilcha-Mano, S. (2017). Is alliance really therapeutic? A systematic answer based on recent methodological developments. *American Psychologist*, 72(4), 311–325.
- Zilcha-Mano, S., & Errázuriz, P. (2015). One size does not fit all: Examining heterogeneity and identifying moderators of the alliance–outcome association. *Journal of Counseling Psychology*, 62(4), 579.
- Zilcha-Mano, S., & Errázuriz, P. (2017). Early development of mechanisms of change as a predictor of subsequent change and treatment outcome: The case of working alliance. *Journal of Consulting and Clinical Psychology*, 85(5), 508–520.
- Zilcha-Mano, S., Dinger, U., McCarthy, K. S., & Barber, J. P. (2014). Does alliance predict symptoms throughout treatment, or is it the other way around? *Journal of Consulting and Clinical Psychology*, 82(6), 931.
- Zilcha-Mano, S., Muran, J. C., Hungr, C., Eubanks, C. F., Safran, J. D., & Winston, A. (2016). The relationship between alliance and outcome: Analysis of a two-person perspective on alliance and session outcome. *Journal of Consulting and Clinical Psychology*, 84(6), 484.
- Zilcha-Mano, S., Solomonov, N., Chui, H., McCarthy, K. S., Barrett, M. S., & Barber, J. P. (2015). Therapist-reported alliance: Is it really a predictor of outcome? *Journal of Counseling Psychology*, 62(4), 568.