

One Size Does Not Fit All: Examining Heterogeneity and Identifying Moderators of the Alliance–Outcome Association

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Although the alliance–outcome association is one of the most consistent findings in psychotherapy research, it is also highly heterogeneous. Little is known about the factors explaining this variability, and consequently there is a lack of adequate knowledge about how to utilize this association to improve treatment. The present study had the following objectives: (a) to examine the associations between within- and between-individual variability in alliance and outcome, controlling for previous symptomatic levels; (b) to examine the duration of the alliance–outcome association; and (c) to examine potential moderators of the alliance–outcome association. A total of 547 patients treated in a primary care psychotherapy setting in Chile were randomly assigned to 5 feedback conditions. The alliance–outcome association was analyzed using multilevel models, disentangling changes in alliance within-individuals from alliance between-individuals. Patient and therapist characteristics were examined as potential moderators. Findings suggest that patients who reported a better early alliance also reported a better outcome. Furthermore, patients reporting time-specific improvement in alliance also reported a greater reduction in symptoms. The unique effect of alliance on outcome at one point in time is maintained for a period of 2 weeks. Patients with more severe symptoms and longer treatments benefited more from a good alliance. Therapists identifying themselves as more integrative in their treatment orientation were able to better utilize good alliances for treatment success. Finally, the size of the alliance–outcome association can be manipulated by feedback to therapists.

Keywords: alliance, outcome, moderation, psychotherapy processes, feedback

Effective psychotherapies are characterized by good therapeutic alliances between patients and their therapists (Crits-Christoph, Gibbons, & Mukherjee, 2013). The therapeutic 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 necessary to achieve them (Bordin, 1979; Hatcher & Barends, 2006). The quality of the therapeutic alliance is a consistent predictor of outcome in psychotherapy, with stronger alliances being associated with better therapeutic outcomes (Horvath, Del Re, Flückiger, & Symonds, 2011). Although still requiring replication, recent studies have shown that this association may be significant even if we account for the temporal precedence between alliance and symptoms (Falkenström, Granström, & Holmqvist, 2013; Xu & Tracey, 2015; Zilcha-Mano, Dinger, McCarthy, & Barber, 2014). The duration of such temporal precedence,

however, has not been empirically explored to date, and it is not known how long alliance at a given point in time affects subsequent symptoms. Another relatively understudied area is the existence of moderators as a source of variability in the alliance–outcome association. Although the associations between alliance and symptoms have been found to be reliable across 190 studies, they also show high variability, $Q(189) = 498.42, p < .0001$ (Horvath et al., 2011). This variability underscores the importance of identifying significant moderators of the alliance–outcome association, which can then be utilized to improve treatment.

It is generally accepted that different patients benefit from different aspects of therapy, so that significant moderators exist for the association between process variables (such as alliance) and outcome. Identifying these moderators can help augment existing treatments by tailoring psychotherapy interventions to individuals (DeRubeis, Cohen, et al., 2014). Neglecting the sources of variability in the alliance–outcome association is inconsistent with the perception of many clinicians that alliance, as well as therapeutic work aimed at improving it, is more important for treatment success for some patients than for others. Similarly, many clinicians and researchers believe that some therapists make better use than others of alliance in improving treatment efficacy (Baldwin & Imel, 2013; Del Re, Flückiger, Horvath, Symonds, & Wampold, 2012). These perceptions have received support from the significant heterogeneity documented in the alliance–outcome association (Horvath et al., 2011). The discrepancy between therapists' prevailing perceptions and the lack of empirical attention paid to the sources of the significant variability in the alliance–outcome

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association suggests that further research is necessary concerning the patient and therapist characteristics that may serve as moderators of the alliance–outcome association.

A recent meta-analysis found that outcome measures and time of assessment were significant moderators of the alliance–outcome association (Horvath et al., 2011), but because these variables are not related to patient or therapist characteristics, they may have little clinical utility. No patient or therapist characteristics have been examined in this meta-analysis, except for the therapist's treatment orientation. Another recently published meta-analysis has begun to shed light on the importance of patient characteristics as moderators of the alliance–outcome association (Flückiger et al., 2013). Specifically, this meta-analysis demonstrated that the patient's ethnicity and the presence of substance use moderate the alliance–outcome association. However, examining moderators by relying exclusively on meta-analyses limits our ability to contribute to personalized treatment because we can draw inferences only about samples, not about individuals. To contribute to personalized treatment, it is necessary to study both patient and therapist characteristics as moderators of the alliance–outcome association, using individual patient data.

Studies that used individual patient data to examine moderators of the alliance–outcome association are scant. The few available studies suggest that this is a promising path for future research. To the best of our knowledge, Falkenström et al. (2013) were the first to directly examine this issue. Their findings suggest that personality problems moderate the alliance effect on outcome, so that in a group of patients with personality problems, the effect of alliance on symptoms was stronger than in a group without personality problems. Another study, by Lorenzo-Luaces, DeRubeis, and Webb (2014), found that the number of the patient's prior depressive episodes was a significant moderator of the alliance–outcome association, so that the alliance predicted outcome in a subgroup of patients with 0–2, but not in those with 3 or more prior episodes. These two studies provide a promising starting point for research in this field, but additional studies are required to fully explore the topic, with the ultimate goal of predicting the effect of alliance on outcome for an individual patient working with a given therapist, and to identify ways to increase this effect.

When addressing heterogeneity in the alliance–outcome association throughout treatment, we must take into account three potential levels of alliance effect on outcome (Curran & Bauer, 2011). To date, most of the literature on the alliance–outcome association used an aggregated or single alliance measurement, and therefore focused only on one level of alliance effect on outcome: the association between the patients' mean alliance levels (or alternatively, the alliance at one time point in the treatment) and outcome. This association has been termed between-patients effect (Baldwin, Wampold, & Imel, 2007). It has been suggested recently that two additional levels of alliance are equally, if not more important: the within-patient and the between-therapists effects (Baldwin & Imel, 2013; Baldwin et al., 2007; Curran & Bauer, 2011; Falkenström et al., 2013). A framework that considers all three potential effects of the alliance–outcome association together is therefore proposed. At the first level, the within-patient alliance effect on outcome reflects the association between time-specific changes in an individual patient's alliance (e.g., improvement, no change, or deterioration in the alliance relative to what is expected for the individual patient) and changes in the patient's

outcome (e.g., improvement, no change, or exacerbation of symptoms). At the second level, the between-patients alliance effect reflects the association between a patient's early or mean alliance level and the patient's outcome. In other words, the between-patient effect examines whether patients who were treated by the same therapist and reported a better alliance also reported better outcomes than did patients who reported a poorer alliance. Whereas the within-patient alliance effect reflects the effect of time-specific changes in the alliance throughout treatment, the between-patients alliance effect reflects the effect of a static characteristic of the alliance for a particular patient.

At the third level, the between-therapists alliance effect reflects the association between an individual therapist's overall or early alliance levels across all patients the therapist worked with in the study, and these patients' outcomes. The therapist effect captures the extent to which variability in the therapists' abilities to establish a strong alliance consistently across all their patients affects outcomes, so that therapists with higher average alliance ratings have patients with better outcomes (see Baldwin et al., 2007 for a comprehensive review of the between-patients-within-therapist and between-therapists effects). Studies that examined the therapist effect yielded mixed results. Some studies found that only the therapist alliance level predicted outcomes (Baldwin et al., 2007; Crits-Christoph et al., 2009; Kivlighan, Gelso, Ain, Hummel, & Markin, 2015), others found that only the patient alliance level predicted outcomes (Huppert et al., 2014), and still others found that both therapist and patient alliance levels predicted outcomes (Marcus, Kashy, & Baldwin, 2009; Zuroff, Kelly, Leybman, Blatt, & Wampold, 2010). Different moderators may affect the alliance–outcome association at each of the three levels, and they may be characteristics of the therapist or of the patient. Despite the importance of these different effects, almost no study to date examined moderators of the alliance–outcome association disentangling the various alliance components.

Several therapist and patient characteristics can serve as moderators of the alliance–outcome association, and they await systematic examination. Some of these have significant clinical utility, for example, therapist characteristics, including years of experience and therapeutic orientation. There are indications that therapists with more years of experience in conducting psychotherapy are better able to cope with challenging populations of patients (Rose, 2013), have patients who demonstrate better perception of the alliance (Meier, Donmall, Barrowclough, McElduff, & Heller, 2005), have lower dropout rates (Roos & Werbart, 2013), and in some cases achieve better outcomes (Driscoll et al., 2003; Huppert et al., 2014) than do their less experienced peers. Therefore, it may be hypothesized that more experienced therapists are more competent in utilizing the alliance for treatment success than are less experienced ones. However, at the same time, it is possible to suggest an antithetical hypothesis: novice therapists, not experienced enough in certain therapeutic techniques, may compensate for their inexperience by using the alliance as a way of facilitating change. This assumption of compensation has gained support from the finding that although inexperienced therapists are less competent in the use of various techniques (e.g., Hollon & Beck, 1994), in many cases it is difficult to find significant differences when novice therapists are compared with their more experienced colleagues in patient outcomes (e.g., Andersson, Carlbring, Furmark, & S. O. F. I. E. Research Group, 2012; Crits-

Christoph et al., 1991; Franklin, Abramowitz, Furr, Kalsy, & Riggs, 2003), in patient perceptions of the alliance (Dunkle & Friedlander, 1996), and in their ability to detect patients at risk of deterioration (Hannan et al., 2005). Resolving these competing hypotheses about the potential moderating effect of therapists' experience on the alliance–outcome association has important implications for both therapist training and patient assignment.

Another aspect of treatment that changes from one therapist to another is therapeutic orientation. Different treatment orientations hold different views about the role of alliance in treatment and the ways in which it should be handled (e.g., Castonguay, Constantino, McAleavey, & Goldfried, 2010). Several studies have demonstrated that the alliance–outcome association may operate differently depending on therapeutic approach and the specific techniques being used (Barber et al., 2006; Ulvenes et al., 2012). Nevertheless, findings based on meta-analyses suggest that treatment orientation cannot moderate the alliance–outcome association (Flückiger, Del Re, Wampold, Symonds, & Horvath, 2012; Horvath et al., 2011). More individual patient data are needed to fully examine this issue. Furthermore, because most therapists declare that they are integrative in their therapeutic orientations (Cook, Biyanova, Elhai, Schnurr, & Coyne, 2010), it is important to examine treatment orientation not only as a categorical concept (each therapist can have only one characteristic orientation), but also as several continuous concepts (each therapist may resort to each treatment orientation to different degrees). Similarly, it is important to examine whether therapists who view themselves as more integrative in their orientation are better able to utilize the alliance for treatment success (Castonguay, 2011; Castonguay, Goldfried, Wiser, Raue, & Hayes, 1996).

Lorenzo-Luaces et al. (2014) and Falkenström et al. (2013) have suggested that patient characteristics are also critical to the study of alliance–outcome moderators. One of the most assessed pretreatment patient characteristics in psychotherapy research and clinical practice is the pretreatment severity of patient symptoms. Showing that severity of symptoms is a significant moderator of outcome may contribute to personalizing treatment. In a randomized, controlled trial (RCT), Lorenzo-Luaces et al. (2014) failed to find significant moderating effects deriving from the severity of the patient's presenting symptoms (in their case, depressive symptoms). But RCTs may not be the best design for examining the severity of patient symptoms as a moderator of the alliance–outcome association because they use a restricted range of symptoms (DeRubeis, Gelfand, German, Fournier, & Forand, 2014). In support of this argument, Lorenzo-Luaces et al. (2014) found a significant moderating effect for their secondary outcome (symptoms of anxiety), where the range was not restricted through the inclusion criteria of the study. Only one study to date has examined whether symptom severity can moderate the alliance effect on outcome in a naturalistic setting (Falkenström et al., 2013) and failed to find a significant effect.

Length of treatment is another aspect of treatment that changes from one patient to another and may affect the alliance–outcome association. Treatment length may be the product of many factors, such as patient's diagnoses (Mueller & Pekarik, 2000; Stewart, Kam & Baiden, 2014; Zhang, Harvey & Andrew, 2011), patients' and therapists' pretreatment expectations regarding treatment length (Mueller & Pekarik, 2000), and patient demographics (Morris, Simpson & Voy, 2015; Stewart et al., 2014). It may be

suggested that the effect of alliance on outcomes increases as the treatment becomes longer. Some preliminary support for this assumption has been provided by Falkenström et al. (2013), but it requires systematic empirical examination because an alternative hypothesis may be offered, whereby in shorter treatments the quality of the alliance may have more determining effect on outcome than it does in longer treatments.

Another potential moderator of alliance–outcome association is feedback given to therapists regarding patients' perception of the alliance. Previous studies demonstrate how continuous process and outcome assessments can be used as feedback that serves to monitor treatment progress. The feedback can help the therapist identify patients who are not progressing as expected, giving the therapist the opportunity to address the lack of progress or deterioration of the patient immediately, and modify the treatment as needed. Accumulating studies testing the effects of feedback on the outcome of psychotherapy have yielded promising findings (e.g., Boswell, Kraus, Miller, & Lambert, 2015; Lambert et al., 2001, 2002; Reese, Norsworthy, & Rowlands, 2009; Shimokawa, Lambert, & Stark, 2010; Whipple et al., 2003). The effect of feedback systems appeared to be substantial in reducing deterioration rates and enhancing positive outcomes, especially in patients for whom treatment was predicted to fail (Hansen, Lambert, & Forman, 2002; Lambert, 2013; Shimokawa et al., 2010). In some cases, feedback tripled treatment effectiveness (Anker, Duncan, & Sparks, 2009; Kraus, Castonguay, Boswell, Nordberg, & Hayes, 2011).

Some of the studies on feedback examined the effect of combined feedback on the alliance with feedback on outcome (e.g., using the Partners for Change Outcome Management System: International Center for Clinical Excellence measure), but to the best of our knowledge, no study has examined alliance feedback on its own. Alliance monitoring may provide increased opportunities to work on improving the alliance and repair alliance ruptures (Ackerman et al., 2001). Studies in which feedback on the therapeutic alliance was provided to therapists found a lower dropout rate and better outcome in the feedback condition (Harmon et al., 2007; Whipple et al., 2003), although not without exceptions, where no differences in alliance levels were detected between feedback and nonfeedback conditions (Reese et al., 2013). It is an open question whether feedback on the alliance may alter the alliance–outcome association.

In the current study, we focus on several potential sources of heterogeneity of the alliance–outcome association. First, we examined the question of whether the alliance–outcome association is a within-patient effect, a between-patients effect, or a between-therapists effect (or a combination of these). Second, we examined the duration of the alliance–outcome association. Third, we examined the ability of two characteristics of the therapist (years of experience and therapeutic orientation) and of two characteristics of the patient (general symptom severity and length of treatment) to moderate the alliance–outcome association. We also examined whether the alliance–outcome association can be manipulated through feedback given to therapists on their patients' alliance. In the present study, data from a naturalistic setting were analyzed to enable substantial variability in the potential moderators (DeRubeis, Gelfand, et al., 2014).

Method

Study Design

All adult patients who started therapy at the specific mental health clinic at the time of the study were asked to participate; there were no exclusion criteria. Of the 953 patients invited to participate in the study, 547 (57.39%) responded positively and participated in the current study (Errázuriz, Constantino, & Calvo, 2015). The patients were randomly assigned to one of five feedback conditions: (a) a control group in which therapists did not receive any feedback; (b) therapists received raw weekly feedback on patients' psychological dysfunction by being given access to the Outcome Questionnaire (OQ), as answered by patients; (c) therapists received weekly raw feedback about patients' alliance perception by being given access to the Working Alliance Inventory (WAI), as answered by patients; (d) therapists received raw weekly feedback about patients' OQ and WAI, as answered by patients; and (e) therapists received weekly feedback containing Lambert's OQ progress feedback report, which included progress graphs and warnings about patients who were not showing expected treatment responses. The randomized trial took place in an outpatient mental health clinic in Santiago, Chile (Errázuriz et al., 2015).

Participants

The patients' mean age was 41.33 ($SD = 12.82$); 74.39% of participants were female. Mean level of education was 14.1 years ($SD = 2.9$), and the median monthly family income was \$1,130 dollars, ranging from \$452 to \$3,612. Among all patients, 64.9% were employed, 11.3% were students, 18.5% were homemakers, and 3.5% were retired. In addition, 27.8% were single, 52.8% married, 17.3% divorced, and 2% widowed. Furthermore, 94.9% were heterosexual, 3.2% homosexual, 0.8% bisexual, and 1.1% answered that they did not know. All but one patient were Chilean. Five percent of patients identified themselves as indigenous, and the rest as nonindigenous. Regarding religion, 64.14% were Catholic, 8.32% Evangelical or Protestant, 18.48% Jehovah's Witness, 3.7% reported "other" religious affiliation, and 5.36% reported no religious affiliation.

The mean level of psychological functioning (as measured by the OQ-30.2; Lambert, Vermeersch, & Brown, 2004) at Session 1 was 58.59 ($SD = 16.67$). This is considered dysfunctional compared with the healthy population in Chile, which was found to have a mean OQ-30.2 score of 29.8 ($SD = 14$; Errázuriz & Opazo, 2015). The percentage of patients taking psychiatric medication was 89.81%, and the percentage of patients previously hospitalized in a psychiatric hospital was 10.69%.¹

The majority of patients receiving an Axis I diagnosis were diagnosed with depressive disorders (68.73%), bipolar disorder (5.48%), adjustment disorder (2.19%), or dysthymia (1.83%). Of the patients, 23% received a diagnosis of at least one comorbid Axis I disorder. The most prevalent diagnoses were substance-related disorders (4.02%), panic disorder without agoraphobia (3.65%), and generalized anxiety disorder (2.56%). The majority of patients receiving an Axis II diagnosis were diagnosed with borderline personality disorders (2.56%), dependent personality disorders (1.46%), and histrionic personality disorder (0.55%). All

participating patients signed informed-consent forms, and the study was approved by the relevant ethical review boards.

Therapists

A total of 28 therapists took part in the study. All had a professional degree in psychology, that is, that they all graduated from a 5-year, full-time professional program in psychology that commonly includes one or two years of clinical psychology training. Most of the training consists of course work, and the final semesters are generally spent in supervised internships. In Chile, the dominant theoretical orientations are cognitive, psychodynamic, systems theory, and humanistic. Most universities that offer professional degrees in psychology, including the ones represented in the present sample, train in several theories and in integrative approaches. In the current sample, all but two of the therapists completed formal studies in psychotherapy after receiving their professional degrees as psychologists. Mean clinical experience was 8.38 years ($SD = 5.33$), mean age was 37.79 ($SD = 7.79$), and 68% were women. All therapists were Chilean, and none identified themselves as indigenous. Regarding the therapists' religion, 56% were Catholic, 4% Evangelical or Protestant, 4% Jewish, 4% Bahá'í Faith, and 32% reported no religious affiliation. Mean levels of reported use of each core theoretical orientation (scored on a 0–5 Likert scale, with 5 as the highest score) are presented in Table 1. The mean number of patients treated by each therapist in the current study was 20 ($SD = 14.6$; range = 1–51).

Treatments

Except for the feedback received, treatments were delivered as usual. All patients were treated in individual therapy, independently of their presenting problem or their therapists' main theoretical perspective. The usual treatment at this clinic, and perhaps generally in Chile, relies on an integrative approach. The duration of each session was approximately 50 minutes. Treatment length was determined jointly by patients and therapists, as well as by practical concerns (patients' financial considerations, health insurance, etc.). The mean length of treatment was 7.82 sessions ($SD = 6.62$, $Mdn = 6$), with a range of 1–55. This is similar to what has been reported in primary care routine practice in the United States (Hansen et al., 2002), United Kingdom (Stiles, Barkham, Mellor-Clark, & Connell, 2008), and Sweden (Falkenström et al., 2013). On average, patients attended 74.15% ($SD = 18.94$) of their scheduled sessions.

Measures

Therapeutic alliance. The patient's perception of the quality of the therapeutic alliance was assessed using the 12-item patient-

¹ The decision to hospitalize a patient in Chile is made by emergency room personnel or the treating psychiatrist, based on evaluation of the risk the person poses to self and others, or when it is necessary in order to find the appropriate pharmacological treatment. The relatively low percentage of previously hospitalized patients in the current cohort may stem from the lower levels of psychiatric hospitalization in Chile than in other countries. For example, according to the Chilean government (2015), each year 0.03% of the population aged 15 years and older consult for depression (the most prevalent diagnosis in the current sample). Of this percentage, 10% are treated by a psychiatrist and 0.2% are hospitalized (Ministerio de Salud de Chile, 2015).

Table 1
Means, SDs, and Range of Study Variables

Variable	<i>M</i>	<i>SD</i>	Min	Max
WAI	74.63	8.86	19	84
OQ	53.35	17.55	0	104
Treatment length	7.48	5.62	3	35
Therapist experience	8.38	5.33	2	25
Patient initial symptom severity	59.52	16.75	4	104
Therapist orientation				
Systems	3.75	1.16	0	5
Psychodynamic	3.00	1.60	0	5
Behavioral	2.77	1.63	0	5
Humanistic/existential	2.00	1.65	1	5
Therapist theoretical integration	3.70	1.26	1	5

Note. min = minimum values of the variable; max = maximum value of the variable; WAI = Working Alliance Inventory; OQ = Outcome Questionnaire. All values are for the sample included in analyses.

rated version of the WAI (Tracey & Kokotovic, 1989). Items were rated by patients on a 7-point Likert scale, ranging from 1 (*never*) to 7 (*always*). The WAI (long version) was found to have good reliability ($\alpha = .91$) and to demonstrate convergent validity in Chile (Santibáñez, 2003). The WAI Spanish (short version) was also found to have good reliability ($\alpha = 0.91$; Corbella, Botella, Gómez, Herrero, & Pacheco, 2011). In the current study, the mean internal reliability level across time points was .85.

Outcome measure. Psychological dysfunction was assessed with the 30-item patient-rated version of the OQ (Lambert et al., 2004), designed to measure patient progress over the course of therapy. Patient progress was monitored along three primary dimensions: (a) subjective discomfort (e.g., anxiety and depression: "I feel blue"), (b) interpersonal relationships (e.g., "I feel lonely"), and (c) social role performance (e.g., "I have too many disagreements at work/school"). Possible scores ranged from 0 to 120, with higher scores reflecting higher severity of distress. The OQ-30.2 has been found to have good internal consistency ($\alpha = .90$), good concurrent validity (with the Depression Anxiety Stress Scales: $r = .82$) and sensitivity to change. Cutoffs and norms were similar to those obtained in the original English version (Errázuriz & Opazo, 2015). In the present study, we used the total score, a global assessment of patient functioning. The mean internal reliability level across time points was .93.

Procedure

All patients answered the same questionnaires, independently of feedback condition. In the beginning of treatment, each patient and therapist independently completed demographic surveys, and therapists reported their general treatment orientations by rating on a 0 to 5 Likert scale the extent to which each core treatment orientation describes their work in general (systems, cognitive, psychodynamic, behavioral, and humanistic/existential), as well as their level of theoretical integration. The OQ and WAI were completed by the patients at every session. Data were collected from a total of 3,174 sessions.

Data Analysis

The data were hierarchically nested on three levels: assessments nested within patients nested within therapists. To account for the

correlation between within-patient session observations and of observations from patients of the same therapist, we added both the random intercept and random slope of log of time of patients nested within therapists, and the random intercept of therapists to the model using the SAS PROC MIXED procedure for multilevel modeling (Littell, Milliken, Stroup, Wolfinger, & Schabenberger, 2006). All analyses were conducted within a three-level hierarchically nested model (see Baldwin & Imel, 2013, for a comprehensive description), regardless of the significance of the therapist's random effect, as even small amounts of between-therapists variability might lead to biased estimates (Crits-Christoph & Mintz, 1991; Wampold & Serlin, 2000). To measure the amount of unexplained variance in outcome because of the random effects of the therapist and patient, we used intraclass correlations (ICCs), which reflect the proportion of variance because of the random effects of the therapist and patient.

To examine alliance and outcome behavior over time, we evaluated the following models for each: linear, quadratic, linear in log of time, and stability over time with several definitions of random effect. 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. We used the log likelihood test to determine whether the inclusion of each term improved the model fit.

To search for the appropriate covariance structure that best fit our data (Heck, Thomas, & Tabata, 2010), the following covariance structures were compared using the Akaike Information Criterion (AIC) index for each of the predicted variables (i.e., OQ, WAI): Toeplitz, H Toeplitz, conditional stimulus (CS), heterogeneous CS (CSH), heterogeneous autoregressive (ARH)(1), autoregressive (AR)(1), unstructured (UN), and variance components (VC). The models with the smallest AIC were chosen (Marcoulides & Hershberger, 1997).

The effect of alliance on outcome was divided into three levels: (a) within-patient effect, (b) between-patients effect, and (c) between-therapists effect. To untangle the three levels of the effect of alliance, we followed Curran and Bauer's (2011) recommendations by applying a linear regression of alliance against log of time for each patient and using the residuals as the within-effect covariate. Thus, the within-patient changes in alliance were measured by the difference between the time-specific observation and its expected value given a linear growth in log of time. The estimated intercept of these regressions was used to obtain the between-patients covariate. By setting time to zero at Session 1, the regression intercept represents the fitted value of the alliance at week 1 for each patient (for a similar procedure, see Hoffart, Økstedalen, Langkaas, & Wampold, 2013). After obtaining the intercepts of the regressions on each patient, we calculated the mean of the intercepts of all patients treated by a particular therapist. The between-patients alliance for a patient within his or her therapist was the difference between his or her regression intercept and his or her therapist mean. These means of the intercepts were used as representatives of the between-therapists alliance.

Such a procedure produced coefficients for within- and between-individual effects. Using this approach to disaggregate the within-patient, between-patients (within therapist) and between-therapists components of alliance, we examined all alliance components simultaneously as predictors, in a combined model. The same procedure was used to examine the reverse relationship,

namely the ability of symptom severity (within-patient, between-patients, and between-therapists components) to predict alliance.

To examine the durability of the alliance effect on outcome, we conducted the following procedure with regard to the model predicting outcome from alliance (see Granger, 1969): (a) to account for any auto-regression effect of symptoms, we progressively included into the model the previous session values of the outcome measure, starting with the last session outcome and adding the outcome of the previous sessions at each step, until the added variable was not significant; (b) we progressively added into the same model the previous session value of the alliance, starting with the last session alliance and adding the alliance levels of the previous sessions, until the added variable was not significant. This stage tests the durability effect of alliance after controlling for the auto-regressive effect of symptoms. Similarly, to examine the durability of the effect of severity of symptoms on alliance, we repeated this procedure, gradually adding the alliance levels, and next the symptom levels of each previous session.

To investigate moderators of the relationship between alliance and outcome, we examined the interaction between each of the five potential moderators (therapist experience and theoretical orientation, patient symptom severity and treatment length, and feedback given to the therapists) and the alliance components in predicting outcome. We were interested in examining all five core theoretical orientations (systems, cognitive, behavioral, psychodynamic, and humanistic) as continuous variables because many therapists are eclectic in their orientation and influenced by more than one orientation. Therefore, we used all five variables as potential moderators, correcting for multiple comparisons with the Benjamini-Hochberg method (Benjamini & Hochberg, 1995), using a false discovery rate of $p < .05$.

In all analyses, we controlled for (a) feedback condition by introducing it to all models as a main effect (except for the analysis that focused on feedback condition as a moderator), (b) pretreatment symptom severity (except for the analysis that focused on pretreatment symptom severity as a moderator), and (c) autoregressive effects of the outcome variables (i.e., controlling for the previous levels of the outcome variable over time), to be able to account for an alternative explanation of reverse temporal relationship between alliance and symptoms (Bolger & Laurenceau, 2013; DeRubeis, Brotman, & Gibbons, 2005).

Multilevel models are based on the assumption that observations are missing at random (MAR); therefore, the missing values are allowed to be related to covariates and to the dependent variable on other occasions, but not to the dependent variable on the dropout occasion (e.g., Gallop & Tasca, 2009). This assumption is not likely to be confirmed in a naturalistic data set (Baldwin, Berkeljon, Atkins, Olsen, & Nielsen, 2009; Falkenström et al., 2013). Statistical models treat all observations after termination of treatment for patients with shorter treatments than the longest one (e.g., successful ending of treatment, dropout, etc.) as missing data. Therefore, following Falkenström et al. (2013), we used a pattern-mixture approach to test whether the parameter estimates depend on missing data by estimating the model separately in subgroups with different length of treatment. Based on visual inspection of the outcome means over time, four distinct patterns were identified. Because few patients attended more than 35 sessions ($n = 5$), and because these patients showed a distinct pattern of change in outcome over time, they were dropped from further analyses. In

subsequent analyses, all regressions were tested for an interaction of each covariate with the missing pattern group. For each interaction with a covariate that was not significant, we concluded that missing data did not influence or bias that effect of the covariate on symptoms. Therefore, we sequentially removed the insignificant interactions according to significance level. If any interactions were significant, we kept them in the model. To estimate the marginal effect of the covariate, we used a weighted average of the effect of the covariate, using the proportion of each missing pattern group as weights. Furthermore, the pattern-mixture approach analyses were repeated, comparing the two patterns of completers and dropouts.

Results

Means and *SDs* for the study variables appear in Table 1. We compared the fits of several models of change over time for both alliance and outcome. The model that was found to have the best fit based on the Akaike Information Criterion (AIC) for both alliance and symptoms was the one with a fixed effect of log of time, random intercept, and random slope in log of time. This model was used in all analyses for both alliance and symptoms. An investigation of the appropriate covariance structure found that the variance components best fit our data based on the AIC index for both the OQ and WAI.

Therapist's Random Effect

The estimated variance of the therapist's random effect in the three-level model predicting outcome was null. This finding indicates that the therapist's random effects did not contribute significantly to the variance in outcome. However, the estimated variance of the therapist's random effect in the three-level model predicting alliance was marginally significant ($p = .06$), and the proportion of unexplained variance because of the therapist as a random effect was $ICC = 3.73\%$.

Patient's Random Effect

The estimated variance of the patient's random effect in the three-level model predicting outcome was significant (indicating that patient's random effects contributed significantly to the variance in outcome; $p < .0001$), and the ICC for the patient random effect was 65.73% . The estimated variance of the patient's random effect in the three-level model predicting alliance was significant as well ($p < .0001$), and the ICC for the patient random effect was 64.15% .

Alliance Effect on Outcome

We conducted a three-level model analysis in which within-patient, between-patients, and between-therapists alliance effects were the predictors of outcome, controlling for the lagged effect of the outcome. The effect of between-patients alliance was significant, $\beta = -0.26$, $SE = .09$, $p = .007$, indicating that patients who report better early alliance also report greater improvement in outcome, taking into account previous outcome levels. The within-patient alliance effect was also significant, $\beta = -0.33$, $SE = .03$, $p < .0001$, indicating that a patient who reports improvement relative to his or her expected level of alliance, is more likely to

report greater reduction of symptoms.² The effect of between-therapists alliance was not significant, $\beta = -0.21$, $SE = .30$, $p = .48$, indicating that for the present cohort differences between therapists in their patients' early alliance levels did not contribute significantly to differences in patient outcome.³

Symptom Severity Effect on Alliance

We conducted a three-level model analysis in which within-patient, between-patients, and between-therapists symptom severity effects were the predictors of alliance, controlling for the lagged effect of the alliance. The effect of between-patients symptoms was significant, $\beta = -0.11$, $SE = .02$, $p < .0001$, indicating that patients who report lower early symptom severity also report better alliance, taking into account previous alliance levels. The within-patient alliance effect was also significant, $\beta = -0.12$, $SE = .01$, $p < .0001$, indicating that patients who reports improvement relative to their expected level of symptoms are more likely to report a better alliance. The effect of between-therapists alliance was not significant, $\beta = -0.12$, $SE = .12$, $p = .28$, indicating that for the present cohort differences between therapists in their patients' symptom severity levels did not contribute significantly to differences in the patients' alliance levels.

Durability of Alliance Effect on Outcome

We examined the durability of the alliance effect on outcome. First, we found that the auto-regression was up to two lags, $\beta = .10$, $SE = 0.02$, $t(1901) = 4.43$, $p < .0001$ and $\beta = .24$, $SE = 0.02$, $t(1893) = 9.64$, $p < .0001$, for the first and the second lags, respectively. The third lag did not contribute significantly to the model, $\beta = -.02$, $SE = 0.02$, $t(1750) = -1.04$, $p = .30$. Next, we examined how many lags of WAI contribute to the model predicting the OQ. We added sequentially the lagged values of the within-patient WAI and found that two lags added significantly to the prediction, $\beta = -.09$, $SE = 0.03$, $t(1753) = -2.69$, $p = .007$ and $\beta = -.12$, $SE = 0.03$, $t(1818) = -3.61$, $p = .0003$ (for the first and second lags, respectively), whereas the third lag did not make a significant, unique contribution to the model, $\beta = -.04$, $SE = 0.03$, $t(1841) = -1.31$, $p = .19$. This finding suggests that higher alliance was significantly associated with better outcomes for up to two subsequent sessions.

Durability of Symptom Severity Effect on Alliance

The auto-regression effect was up to three lags, $\beta = .16$, $SE = 0.01$, $t(1,500) = 8.43$, $p < .0001$, $\beta = .17$, $SE = 0.02$, $t(1,893) = 8.45$, $p < .0001$, and $\beta = .12$, $SE = 0.02$, $t(1,656) = 6.00$, $p < .0001$ for the first, second, and third lag, respectively. Next, we examined how many lags of OQ contribute to the model predicting the WAI. We added sequentially the lagged values of the within-patient OQ and found that only one lag added significantly to the prediction, $\beta = -.03$, $SE = 0.01$, $t(1,515) = -2.09$, $p = .03$, whereas the second lag did not make a significant, unique contribution to the model, $\beta = -.02$, $SE = 0.01$, $t(1,667) = -1.76$, $p = .07$. This finding suggests that better session outcome was significantly associated with better alliance, but only up to one subsequent session.

Moderators of Alliance Effect on Outcome

We examined the interaction between each of the five potential moderators and the alliance components in predicting outcomes, controlling for previous symptomatic levels. The interaction between treatment length and the within-patient component of the alliance was significant, $\beta = -0.02$, $SE = .006$, $p = .0004$, indicating a significant moderating effect of treatment length on the alliance-outcome association, with the alliance-outcome association being stronger for longer treatments. We estimated the region of significance of the alliance-outcome association using the Johnson-Neyman technique (Hayes & Matthes, 2009) as all the values that are higher than 5.19 for the within-patient effect. This finding indicates that in treatments longer than 6 sessions the alliance may have a significant effect on symptoms, whereas in shorter treatments the alliance does not significantly predict symptoms (Table 2; the mean length of treatment in the data used in the analyses was 7.48 sessions, $SD = 5.62$, and range = 3–35). The interaction between treatment length and the within-patient component of the alliance was still significant after adding the patients' therapist mean treatment length in the study to the model, suggesting that the effect of treatment length is a patient characteristic.⁴

The interaction between patient symptom severity and the within-patient component of the alliance was significant, $\beta = -0.01$, $SE = .002$, $p < .0001$, indicating a significant moderating effect of patient symptom severity on the alliance-outcome association, with the alliance-outcome association being stronger for patients with more severe symptoms. We estimated the region of significance of the alliance-outcome association using the Johnson-Neyman technique as all the values that are higher than 50.24 OQ points of severity, indicating that the alliance-outcome association was significant only for patients with at least 51 OQ points of symptom severity (Table 2).

The interaction between therapist's experience and the within-patient component of the alliance was not significant, $\beta = -0.002$, $SE = .009$, $p = .78$. Similarly, the interactions between the therapist's theoretical orientation and the within-patient component of the alliance was not significant for all therapist theoretical orientations, $.09 \leq p \leq .79$, indicating no significant moderating effect of theoretical orientation on the alliance-outcome association. Similar results were obtained when examining all therapeutic orientations in the same analyses and the therapists' tendency to use each orientation separately.

² We also tested the cross-level interactions between within-patient and between-patients alliance. Findings suggest no significant interaction for the present cohort.

³ The mean and SD for the mean intercepts of all the therapists' patients was 71.87, with a SD of 3.33 (range = 64.73–79.88).

⁴ To examine whether the moderating effect of treatment length can be explained by patient diagnosis, we conducted an exploratory analysis and examined whether the most frequent diagnoses, e.g., major depressive disorder (MDD), had different treatment lengths than other diagnoses. Findings suggest that patients with MDD had marginally longer treatments than did patients without MDD, $t(69.98) = 1.83$, $p = .07$; equal variance could not be assumed. Furthermore, we added an interaction between MDD diagnosis and within-patient alliance to the model examining the moderating effect of treatment length. As a result, the interaction between treatment length and within-patient alliance remained significant, although less so than it was without controlling for the interaction between MDD diagnosis and within-patient alliance.

Table 2
Slope Estimates for the Relevant Alliance Components in Predicting Outcome for the Entire Sample and for the Lower and Higher Levels of the Moderators

Label	Estimate	SE	<i>t</i>	<i>p</i>
Entire sample	-0.33	0.03	-8.80	<.0001
Patient symptom severity				
Pretreatment OQ \leq 50	-0.12	0.10	-1.16	.24
Pretreatment OQ \geq 51	-0.32	0.04	-6.73	<.0001
Patient treatment length				
Treatment length \leq 5	-0.14	0.10	-1.33	.18
Treatment length \geq 6	-0.30	0.04	-6.44	<.0001
Therapist level of psychotherapy integration				
Therapist level of integration \leq 2	-0.05	0.11	-0.49	.62
Therapist level of integration \geq 3	-0.31	0.04	-6.58	<.0001
Feedback condition				
Feedback on alliance	-0.53	0.10	-5.24	<.0001
No feedback	-0.26	0.09	-2.88	.007

Note. OQ = Outcomes Questionnaire. Because of space limitations only the relevant alliance components are presented. β s are not standardized.

The interaction between therapist's level of theoretical integration and the within-patient component of the alliance was significant, $\beta = -0.11$, $SE = .03$, $p = .002$, indicating a significant moderating effect of the therapist's level of theoretical integration on the alliance–outcome association, in which the alliance–outcome association was stronger for therapists who saw themselves as more integrative. We estimated the region of significance of the alliance–outcome association using the Johnson–Neyman technique as all the values that are higher than 2.58 on a 0–5 Likert scale (the mean level of theoretical integration in the present cohort was 3.70, $SD = 1.26$), indicating that the alliance–outcome association was significant only for patients whose therapists rated themselves as 3 and higher on this scale (Table 2).⁵ When all significant effects were examined together in the same model, all showed a significant unique contribution in predicting outcome.

Although many different hypotheses can be generated based on the many feedback conditions used in the present trial, to avoid multiple comparisons and potential confounding of an interactive effect of OQ and WAI feedback, we focused on the comparison between no feedback and feedback only on the alliance. The interaction between no feedback versus feedback on alliance condition and the within-patient component of the alliance was significant, $\beta = -0.27$, $SE = 0.12$, $p = .04$, indicating a significant moderating effect of feedback condition on the alliance–outcome association, with alliance–outcome association being stronger for patients whose therapists received feedback on their alliance levels (Table 2).

Missing Data

The dropout percentage was 26.6%. To search for a potential bias effect of missing data, at the first step all regressions included interactions of each covariate with the missing pattern groups. At the second step, all regressions included interactions of each covariate with the completers versus the dropout group. All the interactions with the missing pattern groups and with the completers versus dropout groups were found not significant (all $ps \geq .11$) and were therefore removed from the model.

Discussion

A great deal of research has been conducted to date on the alliance–outcome association (Crits-Christoph et al., 2013; Horvath et al., 2011). The present study is a step forward in the important process of translating the findings into practical recommendations for personalized treatment, by examining the sources of heterogeneity in the alliance–outcome association. Specifically, the study had the following three goals: (a) examining the associations between within- and between-individual variability in alliance and outcome, controlling for previous symptomatic levels; (b) examining the duration of the alliance–outcome association; and (c) examining potential moderators of the alliance–outcome association.

Regarding the first goal, findings demonstrate both the between-patients and within-patient effects of alliance on outcome and of outcome on alliance. As far as the between-patients effect of alliance on outcome is concerned, patients who reported greater early alliance also reported better outcome; regarding the within-patient effect, those who reported time-specific improvement in the alliance also reported a greater reduction in symptoms. Disentangling the two effects of alliance on outcome is crucial because each has different meanings and implications. Specifically, the within-patient effect can be conceptualized as a state-like characteristic of the alliance at a specific point in time; by contrast, the between-patients effect can be conceptualized as a trait-like characteristic of the alliance of a given patient. The present findings suggest that both the state-like and trait-like characteristics of the alliance were significantly associated with outcome. Thus, the findings support the concept that some patients form better early alliances than others, and that these patients are bound to show better outcomes (namely, a between-patients effect). But the findings also support the idea that changes may take place in the alliance throughout the treatment, and that time-specific changes in a patient's alliance are negatively associated with changes in session outcome, controlling for previous session outcome. In other words, when the alliance for a given patient is higher than expected for that patient, the symptom severity levels of that patient are lower. This finding may support the theoretical claim that alliance is an active ingredient in treatment, capable of inducing symptomatic change, and the theoretical view of the alliance as a curative factor (Norcross, 2011; Rogers, 1951). Of importance, the within-patient alliance effect on outcome is significant even after controlling for previous symptomatic levels throughout treatment.

The findings regarding the reciprocal effect of alliance and outcome are consistent with previous findings based on a variety of analytic strategies and populations (Falkenström et al., 2013; Xu & Tracey, 2015). The findings regarding the association between within-patient alliance and outcome are also consistent with previous findings (Falkenström et al., 2013; Hoffart et al., 2013; Zilcha-Mano, Roose, Barber, & Rutherford, 2015) and with theo-

⁵ To explore the question whether therapists' age can explain the moderating effect of therapists' theoretical integration, we controlled for age and for the interaction between age and within-patient alliance in the model examining the moderating effect of theoretical integration. Findings suggest that results were largely similar whether or not we controlled for these variables.

ries of psychotherapy focusing on the within-individual process (Curran & Bauer, 2011). A within-patient effect afforded us the opportunity to study relationships between variables from session to session, and therefore it is highly relevant for our goal of studying the process of change. The finding regarding the ability of between-patients alliance to predict outcome is consistent with meta-analyses demonstrating the ability of early alliance to predict outcome (Flückiger et al., 2012; Horvath et al., 2011).

The finding regarding the nonsignificant association between the between-therapists alliance and outcome is consistent with studies in which only the patient alliance level predicted outcome (e.g., Huppert et al., 2014; Xu & Tracey, 2015), but inconsistent with studies that found that the therapist alliance level contributed significantly to outcome (e.g., Baldwin et al., 2007; Kivlighan et al., 2015). It is interesting to speculate on the reasons for the nonsignificant between-therapists effect in the present study. On one hand, because the study was conducted in a naturalistic setting, therapist behavior was less constrained by manualization. Therefore, it is reasonable to expect a significant between-therapists effect. On the other hand, other factors may have contributed to therapist homogeneity in the present study. Many of the therapists were trained in the same institutes, and all of them worked in the same clinic. It is possible that variability in the levels of homogeneity among therapists of various clinics may have contributed to the extreme variance found in the between-therapists effect across studies (Baldwin & Imel, 2013). Another potential explanation for the lack of significant between-therapists effect may have to do with the possibility that some therapists (e.g., those seen as more competent) may have treated the more challenging patients. Finally, although the number of therapists who participated in the study (28) is not small relative to many other similar works in the literature, studies have shown that about 50 therapists are needed to accurately estimate the size of the between-therapists alliance–outcome association (Crits-Christoph, Gibbons, Hamilton, Ring-Kurtz, & Gallop, 2011).

The second goal of the study was to examine the duration of the alliance effect on outcome. To the best of our knowledge, the present study is the first to empirically address this question. The present findings demonstrate the durability of the effect of alliance on outcome and suggest that the alliance level in a given session is associated with outcome for up to two subsequent sessions. In other words, the sustained effect of alliance on outcome is maintained for two weeks, even if we take into account the alliance levels in the current session and in that of the previous week. For example, a rupture (or alternatively, an improvement in the alliance) can affect the outcome of the next two sessions. These findings demonstrate the sustained durability of the effect of alliance on outcome without being restricted to extreme changes in alliance (e.g., sudden gains or profound ruptures).

The third goal of the study was to examine potential moderators of the alliance effect on outcome. The study identified specific moderators of the alliance–outcome association that may influence the effect of the alliance on outcome and contribute to the process of building personalized treatments. Four moderators have been identified: Two are characteristics of the patient, one of the therapist, and one of the feedback given. The findings show that patients who had more severe symptoms at the beginning of treatment showed stronger association between alliance and symptoms, such that improvement in the alliance for patients with more

severe initial symptoms was associated with greater reduction in symptoms. Furthermore, patients who underwent longer treatments showed a stronger association between alliance and symptoms, even if adjusting for their therapist's general treatment length across patients. In other words, stronger alliances were associated with greater reduction in symptoms in longer treatments. The findings also indicate that the strength of the alliance contributed more to outcome variance for integrative therapists. This finding may reflect greater flexibility of therapists who regard themselves as more integrative in their theoretical orientation in handling the alliance, especially alliance ruptures (Castonguay, 2011; Castonguay et al., 1996; Safran & Muran, 2000; Shahar, 2013). Finally, the findings suggest that compared with patients whose therapist did not receive feedback, a stronger alliance–outcome relationship was found for patients whose therapists received feedback on their alliance levels.

The present findings are consistent with those of previous studies examining moderators of the alliance–outcome association. Specifically, the finding that the alliance–outcome association is not affected by treatment orientation is consistent with similar findings from recent meta-analyses and individual patient data (Falkenström et al., 2013; Horvath et al., 2011). The present study further contributes to the literature by demonstrating that therapists who consider themselves to be more integrative were better able to utilize good alliances for treatment success. Moreover, our finding that the alliance–outcome association is stronger in longer treatments is consistent with similar preliminary tendencies reported by Falkenström et al. (2013). Potential explanations for the moderating effect of treatment length on the alliance–outcome association include accumulating influences of third variables, such as patient characteristics (e.g., some diagnoses may require longer treatment and indicate greater effect of alliance on outcome) and a dose effect of alliance. Regarding the latter, a minimal amount of beneficial interactions with a therapist may be needed for the alliance to have an effect on outcome, potentially allowing time for issues of therapist–patient interaction to be increasingly explored and worked through (Safran & Muran, 2000).

The findings regarding the moderating effect of pretreatment symptom severity on the alliance–outcome association are consistent with those of Lorenzo-Luaces et al. (2014) on the moderating role of baseline anxiety symptoms, but expand the existing findings to a heterogenic measure of outcome, capturing a variety of symptoms together with interpersonal functioning and social role performance. The present study also contributes to the literature by demonstrating that in this cohort therapist experience (measured in number of years) was not a significant moderator of the alliance–outcome association. The current findings also contribute to the growing promising literature on feedback given to therapists (e.g., Boswell, Kraus, Miller, & Lambert, 2015), demonstrating the ability of feedback on patient's perception of the alliance to alter the alliance–outcome association.

Although the mechanisms underlying the present findings require further investigation, several key implications can be suggested. First, based on the findings of the first goal, therapists should be aware of the fact that both the trait-like characteristics of the alliance (the between-patients effect) and the changes in alliance throughout treatment (the within-patient effect) are associated with outcome. In other words, the findings may support deterministic perspectives on the effect of the patients' general ability to

form a good alliance early in treatment with their therapists on outcome (the between-patients effect), together with optimistic views on the feasibility of bringing about changes in such processes throughout treatment (the within-patient effect). Second, based on the findings of the second goal, therapists should bear in mind that the alliance has a sustained effect on outcome and it is associated with future reductions in symptoms for up to two weeks. Similarly, severity of symptoms may also have an effect on alliance for up to 1 week.

Knowledge achieved based on the third goal, namely that patients' and therapists' characteristics can predict the ability of the alliance to contribute to treatment success, may influence the practice of psychotherapy. Although the mechanism underlying the moderating role of the identified variables needs to be explored, and further validation of these effects is required (e.g., through future dismantling studies), the findings concerning significant moderators of the alliance–outcome association suggest the feasibility of utilizing the alliance–outcome association to optimize treatment. These moderators specify for whom and under what conditions (Baron & Kenny, 1986) alliance is significantly associated with outcome. These moderators (or effect modifiers) may suggest the possibility that in distinct subpopulations (e.g., high vs. low severity of symptoms) different causal chains operate, or one causal chain operates differently (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001), resulting in different effects of alliance on outcome, so that one size does not fit all. If these moderators are ignored, the existence of an alliance–outcome association is assumed implicitly for many patients for whom the alliance may not have any effect on outcome. Although for the average patient a stronger alliance is associated with better outcome, for a particular class or subgroup of patients, defined by specific clinical conditions, no such association may exist.

The findings further demonstrate that the strength of the alliance–outcome association can be manipulated by feedback to therapists on the alliance. The strength of the alliance contributed more to outcome variance when therapists received feedback on their patient's alliance ratings than when they did not. This suggests the possibility of manipulating the alliance effect on outcome, and may contribute significantly to the growing literature on feedback given to therapists. However, before these suggestions can become practical recommendations, future randomized clinical trials with dismantling designs are needed.

The present study has several limitations. First, causality cannot be inferred based on the current findings. Although in all analyses we controlled for previous symptomatic levels and attempted to account for reversed causality between alliance and symptoms, unmeasured third variables may still influence both alliance and symptoms, (and in some instances even influence the moderators, especially treatment length). Future studies measuring potential variables, which may explain the mechanisms behind this association at the same points in time where the alliance and the symptoms are examined, can proceed systematically to uncover the arrow of causality between alliance and symptoms. Future studies should also use randomized controlled trials with dismantling designs to further establish the findings of the current study and examine the mechanisms underlying them. It is also important that future studies recruit patients characterized by sufficient variability in additional potential moderators. For example, studies with adequate representation of each patient's diagnoses would enable

examination of the question whether patient diagnosis explains some of the moderating effect of treatment length on the alliance–outcome association. Second, treatment orientations were examined as single self-reported items created for the present study, nested within therapists, whereas in practice they may vary between patients of the same therapist as well as between sessions (Owen & Hilsenroth, 2014). Therefore, it is important to focus on the actual techniques used in the sessions, although in this case establishing the temporal relationship between the moderator and the outcome may be challenging. Third, although data collection in a naturalistic setting provides an important ecological and statistical advantage for the study, which enables substantial variability in potential moderators (DeRubeis, Gelfand, et al., 2014), a clear disadvantage is that most of the treatments were relatively short and that decisions regarding treatment length were determined on a case-by-case basis, and therefore generalization of results (especially regarding the moderating effect of treatment length) may apply only to relatively short, primary-care psychotherapy. Fourth, although we used the most reliable and valid measures available, session by session, both alliance and outcome measures are based on patients' self-report questionnaires, increasing the risk of shared method variance. Therefore findings should be replicated using other perspectives of the alliance and outcome (therapist's perception and observer's rating). This would also help clarify whether patients' idiosyncratic rating of alliance may have contributed to the current findings. Sixth, it is important to examine similar questions among other population, to determine whether any of the effects detected in the present study are specific to the population used in the current study (Chilean cohort with high rates of depression).

Finally, although the current findings suggest that at least one therapist characteristic (level of integrative theoretical orientation) moderated the alliance–outcome association, additional therapist characteristics, including therapist experience, should be further examined in studies using more therapists and a higher therapist–patient ratio (Baldwin & Imel, 2013; Crits-Christoph et al., 2011; DeRubeis, Gelfand, et al., 2014). In addition, our distinction between therapist and patient variability does not take into account that characteristics of the therapist–patient dyad may be confounded with patient variability (because each patient saw only one therapist it was not possible to separate patient and dyadic variance; see also Baldwin & Imel, 2013) and contribute to the effect of between-patients alliance on outcome.

Conclusion

The results of the present study represent an important initial step in the systematic process of converting alliance–outcome research into personalized treatment. The present study demonstrates that differences between patients in their early levels of alliance, as well as time-specific changes in alliance throughout treatment, are both associated with outcome, even if we account for the temporal relationship between alliance and symptoms. The findings also demonstrate the durability of the effect of alliance on outcome, and suggest that certain therapist and patient characteristics can moderate this effect. Targeting alliance as a transdiagnostic concept to optimize treatment is consistent with the recent National Institute of Mental Health focus on improving treatment success by focusing on factors that cut across many disorders

rather than on specific *Diagnostic and Statistical Manual* (DSM) categories (Insel, 2013). Consistent with recent calls to personalize treatments based on patient characteristics (DeRubeis, Cohen, et al., 2014), the present findings represent an important advance in the utilization of the well-established alliance–outcome association in tailoring treatment to individual patients.

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