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Longitudinal assessments of therapeutic alliance predict work performance in vocational rehabilitation for persons with schizophrenia

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Objectives. To promote functional recovery in persons diagnosed with a psychotic disorder, vocational interventions have emerged over the last few decades which range from sheltered employment to supported employment in the community.

Design. Using data from a 6-month vocational rehabilitation programme, we examined whether assessments of the therapeutic alliance were related to the quality of work performed in this work placement. Our first hypothesis was that stronger alliances would be related to better work performance. Second, we expected that client assessments of the TA would better predict outcomes than therapist assessments. Third, we expected that the discrepancy between assessment scores from the client and therapist (client rating minus therapist rating) would be a better predictor for outcome than individual assessments by the therapists or clients.

Results. Clients systematically rated the alliance higher than therapists. Modelling the data longitudinally, we found both therapist and client ratings predictive of outcome, though client assessments over time were inversely related to work performance.

Conclusions. Discrepancy in scores was also shown to be predictive of work performance during the program. Clinicians are advised to routinely assess the therapeutic alliance from both client and therapist perspectives and calculate the discrepancy between them as they may indicate ruptures are occurring and thus hamper the intervention.

Practitioner points

- Clinicians are advised to regularly assess the therapeutic alliance from both their own and the client's perspective.
- Growing discrepancy in scores may impede intervention effectiveness.

- Therapeutic alliance may help buffer against work stresses experienced by participants in a vocational programme.
- Be aware that therapists tend to rate the alliance lower than their clients.

Outcomes in severe mental illness, such as schizophrenia, include *symptomatic* recovery, subjective-personal recovery and *functional* recovery. Traditionally, symptomatic recovery has been the *de-facto* standard outcome in the assessment of treatment for psychotic disorders. In the wake of the recovery movement, however, it has become increasingly clear that subjective-personal as well as functional recovery (e.g., having vocational activity and social networks) may also be important outcomes to consider, independent from symptomatic recovery (Roe, Mashiach-Eizenberg, & Lysaker, 2011; Silverstein & Bellack, 2008; Van Weeghel, Van Zelst, Boertien, & Hasson-Ohayon, 2019; Vogel et al., 2020). While personal recovery refers to such constructs as connectedness, hope, identity, meaning in life, and empowerment (Van Weeghel et al., 2019), functional recovery involves observable improvements in psychosocial functioning. One important element of functional recovery concerns attaining and maintaining employment. Cross-culturally, many persons with schizophrenia have been observed to struggle to sustain work and earn a living wage (Davidson et al., 2016; van Weeghel, Bergmans, Couwenbergh, Michon, & de Winter, 2020).

To promote functional recovery in the area of work, vocational interventions have emerged over the last few decades ranging from sheltered employment to supported employment in the community (Nelson et al., 2009; Twamley, Jeste, & Lehman, 2003; Van Weeghel, Bergmans, Couwenbergh, Michon, & de Winter, 2020). Generally, these programmes seek to assist people to find and keep work (Kukla et al., 2019) and have been observed to lead to a range of improvements in areas extending beyond quality-of-life benefits from paid work (Bryson, Lysaker, & Bell, 2002), such as increased self-esteem (Mervis et al., 2017), better cognitive performance and reduced negative symptoms (Bio & Gattaz, 2011). These outcomes have not been consistent, however (Kukla, Bell, & Lysaker, 2018), and the key ingredients of these interventions which lead to positive outcomes are less clear. Understanding what exactly leads to a better outcome in vocational interventions seems essential as the field seeks to refine these interventions and develop new ones.

One potentially key ingredient and predictor for positive outcome in vocational rehabilitation is a strong therapeutic alliance. Therapeutic alliance, sometimes referred to as working alliance, reflects the quality and strength of the affective bond between therapist and client, agreement on therapy goals and consensus on methods to achieve these goals (Bordin, 1979). There are several reasons to believe that therapeutic alliance may be a key ingredient in vocational rehabilitation programmes for persons with schizophrenia. Hypothetically, a strong therapeutic alliance could lead a participant in therapy to feel more supported and better able to weather work-related stresses (Davis & Lysaker, 2007).

Therapeutic alliance has been generally found to promote positive outcomes following psychotherapy and psychosocial interventions, in terms of symptomatology and subjective recovery in groups with and without psychosis (Fisher, Atzil-Slonim, Bar-Kalifa, Rafaeli, & Peri, 2016; Frank & Gunderson, 1990; Goldsmith, Lewis, Dunn, & Bentall, 2015; Lysaker, Davis, Buck, Outcalt, & Ringer, 2011). One systematic review, for

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example, investigating the therapeutic alliance in treatment for psychosis (Shattock, Berry, Degnan, & Edge, 2018) concludes that there is evidence that alliance predicts overall symptomatic improvement and notes preliminary evidence that it may predict a reduction in rehospitalization, medication use, and an improvement in self-esteem.

Few studies, however, have specifically explored the effects of therapeutic alliance on working function. One study on the TA between clients and their individual counsellor has found that a better therapeutic alliance predicted better work performance (Davis & Lysaker, 2007); however, another study surrounding a more traditional (i.e., team-based) intervention did not find a link between therapeutic alliance and job tenure (Kukla & Bond, 2009).

The current study aims to explore whether a better TA predicts better work performance among persons with schizophrenia who take part in a vocational rehabilitation programme. Specifically, we examined whether assessments of the therapeutic alliance within a 6-month vocational rehabilitation programme were related to one key set of vocational outcomes: the quality of work performed in a work placement. Our first hypothesis was that stronger TA (reported by both client and therapist) will be related to better work performance. However, as previous findings showed that the client perspective has been a better predictor of therapeutic outcome than that of the therapist (e.g., Horvath & Symonds, 1991), our second hypothesis was that client ratings of the alliance would be a better predictor of work performance.

Our third hypothesis concerns the degree to which the congruence vs. discrepancy between clients' and therapists' assessments of therapeutic alliance is related to outcome. At issue here is whether in addition to the overall degree of positivity of the alliance, the extent to which the dyad sees the relationship in a similar manner also affects outcome. This may be relevant, as a more negative therapeutic alliance may not be an issue in itself: the dyad may be comfortable in a position where the relationship is strained. However, if the relationship feels negative to one participant, while the other fails to recognize this interpersonal issue, the alliance may be ruptured (Safran & Kraus, 2014; Safran, Muran, & Eubanks-Carter, 2011). Previous research findings have supported the notion that congruence in therapists' and clients' assessments of the alliance is related to positive therapeutic outcome (Bachelor, 2013; Laws et al., 2017; Marmarosh & Kivlighan, 2012; Zilcha-Mano, Snyder, & Silberschatz, 2017).

Methods

Participants

Data for the current study were obtained during a randomized controlled trial investigating the effects of three different psychosocial interventions (vocational support, work-focused cognitive behavioural therapy (CBT) or work-focused CBT enhanced with cognitive remediation) to improve work outcomes. All three conditions involved non-competitive work placement throughout the intervention, a weekly individual meeting with a licensed clinician (including Master's level doctoral students or other licensed clinicians), and group sessions over 6 months. During individual CBT sessions, discussions were centred on identifying cognitive process and work-related beliefs. In the vocational support condition, participants also met with a therapist (a different one than the one providing CBT), who offered support surrounding specific situations at work but without the application of CBT elements. For a more in-depth description of the conditions, see Kukla et al. (2018). While specific interventions differ in techniques

employed by the therapists, the current study is centred around the common factor of therapeutic alliance. As such, we combined all three groups into one for analysis.

Inclusion criteria for this study included a diagnosis of schizophrenia or schizoaffective disorder, being currently unemployed yet having a desire to work, and being in a post-acute phase of illness. Diagnoses were confirmed with the Structured Clinical Interview for DSM-IV (SCID-IV; First & Gibbon, 2004). Participants were excluded if they have a medical condition that may interfere with their participation in the programme. Participants received regular medication management and outpatient treatment throughout the study.

Participants were recruited from an outpatient Veteran's Affairs clinic in an urban setting. Data were collected between 2009 and 2013. The full sample participating in the randomized controlled trial ($n = 75$) comprised persons diagnosed with schizophrenia ($n = 53$) or a schizoaffective disorder ($n = 22$). Given our current focus on assessments of therapeutic alliance over time, we excluded participants who had fewer than 2 measurements of TA completed by both therapist and client, and / or fewer than 2 measurements of work performance. This resulted in a final sample ($n = 42$, 177 observations) for the current analyses, primarily male ($n = 40$), aged between 25 and 71 (mean =52, SD = 9) diagnosed with schizophrenia ($n = 30$) or a schizoaffective disorder ($n = 12$).

Instruments

Working Alliance Inventory (WAI) (Horvath & Greenberg, 1986): The shortened, 12-item version (Tracey & Kokotovic, 1989) of the WAI was used to collect monthly ratings of the therapeutic alliance by both the therapist and client. Items are scored on a Likert scale from 1 (Not at all) to 7 (Completely). Clients rate their own stance (e.g., 'I believed that my therapist liked me') while the therapist is asked what they believe the client feels (e.g., 'My patient believed that I like him/her'). Alliance was rated every 4 weeks.

Work Behavior Inventory (WBI) (Bryson, Bell, Lysaker, & Zito, 1997): This 35-item inventory was developed specifically to assess behaviour at work in the context of severe mental illness. Trained raters observed the participants' work behaviour and interviewed participants' supervisors in order to arrive at scores ranging from 1 ('persistent problem area') to 5 ('frequent area of strength') along 5 subscales. For the current analyses, the sum of average scores on these subscales is used. Good inter-rater reliability and concurrent validity have been demonstrated in previous studies using this instrument (Lysaker, Bond, Davis, Bryson, & Bell, 2005). Work performance was scored bi-weekly.

Procedure

Participants in care at the University Indianapolis and Richard L. Roudebush VA Medical Center were invited to participate in the study. After obtaining informed consent, participants were randomized into one of three intervention groups and took part in a vocational rehabilitation programme. Participants received a small compensation for each assessment session ($20) and intervention session ($3.50). For a full description of the study procedure, please see the original report (Kukla et al., 2018).

Statistical analysis

In order to answer our primary research questions, namely whether therapeutic alliance over time predicts the quality of work performance within a vocational programme and whether client or therapist assessments of TA were more predictive of it, linear mixed models were estimated using R (R Core Team, 2018) with the package *nlme* (Pinheiro, Bates, DebRoy, & Sarkar, 2019). All scores were standardized (z-scores) in order to enhance interpretability of results. Initial exploration of the data revealed that the final moment of measurement (At month 6) had very few measurements ($n = 8$) compared with the other moments (avg. $n = 33$). As such, we removed these measurements from further analyses.

Models were built iteratively in 2 phases (Bliese & Ployhart, 2002; Field, Miles, & Field, 2013): in the first phase, we determined how to optimally model time (i.e., as a fixed or random effect, and which covariance structure is the most applicable). The resulting model, in which only time was entered as a predictor, was then used as a base model from which to determine whether the addition of predictors improved the model significantly. The improvement of the model was tested using the likelihood-ratio test (also referred to as the *deviance test*). Statistical significance of the predictors within each model were tested using a *t*-test. It is important to note that work performance (WBI) scores are averages over the time period between bi-weekly therapeutic alliance assessments. In other words, if a participant's therapeutic alliance scores are noted in week 1, the work performance measured at that time point is constructed from their performance in weeks 1 and 2. As such, there is a natural time-precedence in this analysis, roughly similar to entering lagged (lag $= -1$) scores.

Final model fit in terms of variance explained was determined using a version of R^2 developed specifically to address limitations to previous methods (Nakagawa & Schielzeth, 2013). This method produces a value of the variance explained by fixed factors (*Marginal R^2*) and one for the variance explained by both fixed and random factors (*Conditional R^2*). Tables were generated using the package sjPlot (Lüdecke, 2018). This package was unable to estimate the Marginal R^2 and Conditional R^2 for models in which an interaction term was added. As such, these scores were calculated using the MuMIn package (Barton, 2019).

To test whether discrepancy scores are a better predictor of work performance than therapist or client scores, we substituted individual scores for the discrepancy score (client minus therapist scores) in the models and observed changes to model fit. As the discrepancy scores are calculated from client and therapist scores, and the models perform so similarly, we considered it a possibility that raw scores and discrepancy scores are highly correlated. We investigated this possibility by calculating Pearson's correlation coefficients between discrepancy scores, client ratings, and therapist ratings (Table 1).

Table 1. Pearson's correlation coefficients

	Client WAI	Therapist WAI	Discrepancy
Client WAI	1	0.536**	0.113
Therapist WAI	0.536**	1	−0.778**
Discrepancy	0.113	−0.778**	1

**Significant at the 0.01 level (two-tailed).

Results

Average WAI scores reported by the client and therapist, and work performance scores, are represented in Figure 1.

Client and therapist scores of TA were found to be significantly correlated at $p < .01$, with a moderate correlation coefficient of .539. Discrepancy scores were only found to be correlated significantly ($p < .01$) with therapist scores.

In phase 1, we determined that allowing participants to vary in their overall work performance (i.e., adding a random intercept) improved the base model significantly. The addition of a random slope (i.e., patterns by persons over time) demonstrated to be a further significant improvement to the model.

Regarding our first hypothesis, namely that therapeutic alliance scores over time predict the quality of work performed in a vocational work programme, 'raw' scores of therapeutic alliance from the client and the therapist were entered into the model. Addition of these scores improved the model significantly. Next, interaction effects with time were entered (client*time, therapist*time). Again, the model significantly improved with these additions, as can be seen in Table 2.

Regarding hypothesis two, it is of particular note that in the initial model only average client scores across all time points predict quality of work performed and therapist scores do not. However, when taking into account time, both client*time and therapist*time scores were significant at the <.05 level. In terms of variance explained, both models were very lacking when only taking fixed effects into account, explaining just 5% and 7% of the variance in work performance, respectively. Taking into account the 'nestedness' of the data (i.e., that multiple data points come from the same participant) improved the models, which now explain 85 and 87%, respectively. This indicates that the pattern participants display over time adds vital information to the model, which would be obscured when only looking at group averages.

It further warrants attention that client scores over time have an inverse relationship with work performance, that is lower client scores over time on therapeutic alliance were found to be associated with higher work performance over time.
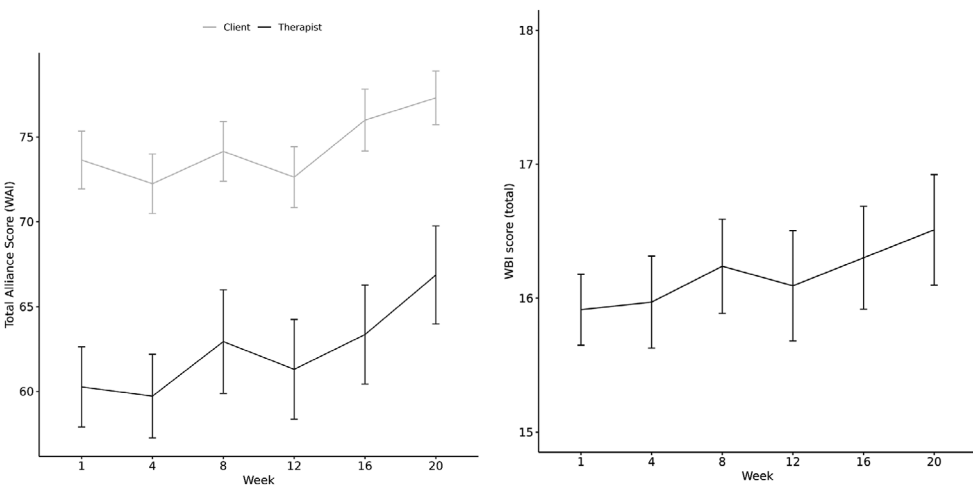
Figure 1. Alliance scores as rated by clients and therapists (left) and scores of the work performance of clients as scored by trained raters (right). Note restricted axes (60–76 and 15–18, respectively).

Table 2. Comparison of models using client and therapist scores of therapeutic alliance on predicting work performance

Predictors	No interaction			Interaction added		
	Estimates	CI	p	Estimates	CI	p
Intercept	12.7133	10.7933 to 14.6333	<0.001*	11.9960	8.9547 to 15.0373	<0.001*
Client WAI	0.0386	0.0143 to 0.0629	0.002*	0.0735	0.0345 to 0.1124	<0.001
Therapist WAI	0.0058	−0.0206 to 0.0322	0.666	−0.0247	−0.0637 to 0.0144	0.222
Time	0.0163	−0.0302 to 0.0629	0.493	0.1274	−0.1418 to 0.3966	0.359
Client WAI*Time				−0.0043	−0.0081 to −0.0005	0.031*
Therapist WAI*Time				0.0033	0.0003 to 0.0064	0.034*
Intraclass Correlation	.85					
Observations	177			177		
Marginal R^2/Conditional R^2	.051/.854			.068/.866		

*Significant at p <0.05.

For our third hypothesis, we wondered whether the discrepancy between therapist and client scores predicts the quality of work performed. As such, we substituted client and therapist WAI scores for a difference score (client minus therapist). Results were highly similar to those when using client or therapist's scores as predictors (Table 3): the addition of an interaction term improves the model significantly. Furthermore, fixed effects alone were weak (2% and 4% variance explained) when compared to fixed and random effects together (86% and 87% variance explained). Note that coefficient beta for discrepancy over time is negative, indicating that a smaller discrepancy in scores over time is associated with better work performance over time. Coefficient beta for discrepancy in general (i.e., taking all time points together) is positive, indicating that greater client-overrating of the alliance is associated with better outcomes.

To ensure we would account for any relationship between missed weeks and TA, we analysed the relationship between missing values on work performance (i.e., missed weeks at work) and therapeutic alliance ratings. We found the number of missing values was not significantly correlated to client WAI scores ($r = .036$, $p = .621$) but was correlated to therapist WAI scores ($r = .16$, $p = .022$). Although weak correlation, we ensured this had no influence on the results by adding missing values to all models as a predictor. Number of missed weeks was not statistically significant in any model and did not significantly influence other results. As such, it was not retained in analyses.

Discussion

In the current study, we sought to investigate whether client and therapist assessments of therapeutic alliance significantly predicted the outcomes of a work rehabilitation programme over time, and which of the assessments (client or therapist) were more predictive. Additionally, we investigated whether the discrepancy or level of similarity between therapist and client's assessments of therapeutic alliance also predicted outcome.

Regarding the first hypothesis, we found that when taking ratings across all time points, more positive client and therapist assessments of therapeutic alliance at predicted better work performance in a vocational programme. These findings are consistent with the possibility that a stronger therapeutic alliance could lead the participant in therapy to feel more supported during the stressful process of trying to work. In addition to this general sense of being supported, therapy sessions may enable clients to discuss their experiences at work with a therapist with whom they can reflect on these experiences and formulate strategies to deal with difficulties. However, over time, client assessments of TA are inversely related to work performance: lower client ratings over time and higher therapist assessments of TA over time are both associated with greater work performance.

This provides an interesting juxtaposition where average ratings of TA (in other words: the average of TA ratings across all time points) behave differently from longitudinal ratings. On the client side: if a client generally rates the alliance higher, this is associated with better work performance. Over time, however, a *reduction* in client alliance ratings is associated with better work performance. For therapists, only the longitudinal effect is significant and positive, meaning that higher therapist ratings over time are related to better work performance of the client.

We see three possible explanations for this finding. The first is that clients, as therapy progresses, felt less and less that they needed support from their therapists in order to succeed at work, and being at a distance from their therapist enabled them to feel

Table 3. Comparison of models using discrepancy in assessments of therapeutic relationship predicting work performance

Predictors	No interaction			Interaction added		
	Estimates	CI	p	Estimates	CI	p
Intercept	15.6387	14.9255 to 16.3519	<.001*	15.1791	14.3752 to 15.9831	<.001*
Discrepancy	0.0205	−0.0017 to 0.0426	0.072	0.0571	0.0248 to 0.0894	.001*
Time	0.0263	−0.0194 to 0.0719	0.261	0.0746	0.0190 to 0.1301	.010*
Discrepancy*Time				−0.0042	−0.0070 to −0.0014	.004*
Intraclass Correlation	.85					
Observations	177			177		
Marginal R^2/Conditional R^2	.022/.858			.044/.87		

*Significant at p <.05.

independent and achieve better work performance. The second is that the alliance as experienced by the client is strained over time, where continued working together brings challenges to the agreement between client and therapist regarding the goals of therapy and the relationship. Such challenges – often referred to as 'ruptures' – have been theorized to be an important mechanism of change (Safran & Kraus, 2014), and therapists' recognition of ruptures has been found to moderate outcome (Chen, Atzil-Slonim, Bar-Kalifa, Hasson-Ohayon, & Refaeli, 2016). The third explanation is that this is simply a regression to the mean effect: clients initially rate the alliance higher and therefore drift downward, while therapists rate the alliance lower and drift upward.

Our second hypothesis was that client assessments of TA would be more predictive of work performance than therapist assessments. Upon first glance, based on all time points' average scores of alliance (therapists and clients), and when comparing time points, our results supported the hypothesis that client scores of alliance are more predictive of outcome than therapist scores. Accordingly, in models in which we only entered client assessments, therapist assessments and a time effect, we found only client assessments to be predictive of work performance. However, when modelling alliance scores over time, adding therapist * time and client * time, both therapist and client assessments are predictive of work performance. This finding is in line with previous studies on therapeutic alliance scores of therapists and clients (Atzil-Slonim et al., 2015; Kivlighan, 2007; Marmarosh & Kivlighan, 2012; Zilcha-Mano et al., 2015) and sheds doubt on the common assumption that client assessments of therapeutic alliance are most associated with outcome. Therapy is an inherently dyadic process over time, and it is possible that only models in which both the dyadic nature (i.e., both perspectives) and the process nature (i.e., time effects) are estimated accurately reflect this process.

With our third hypothesis, we investigated whether the dyadic nature of therapy is best captured by entering client and therapist assessments of TA individually, or as the discrepancy between scores. Our findings indicate that the discrepancy is, in fact, important to consider, even when calculated as a simple difference score. Of note, discrepancy between client and therapist's TA ratings may represent a mismatch in the conceptualization of therapy (Hasson-Ohayon, Kravetz, & Lysaker, 2017). Interestingly, in-depth analyses of discrepancy over time, using the current sample, are reported elsewhere (Hasson-Ohayon et al., 2021) and show that discrepancy in scores are primarily surrounding the *relationship* aspect of the therapeutic alliance, rather than on the tasks and goals aspect. Furthermore, it was found that greater symptoms of emotional discomfort (e.g., anxiety, depression) are related to higher agreement on the alliance between clients and therapists.

These findings map onto results from other studies investigating congruence in scores of TA (Atzil-Slonim et al., 2015; Marmarosh & Kivlighan, 2012), with clinical implications. Accordingly, a clinician who routinely administers assessments of TA over the course of therapy can simply subtract one score from the other and see whether they are still on the right course or if some adjustments need to be made in therapy. In other words: less congruence in scores may be a reliable indicator that a therapeutic rupture (Safran & Kraus, 2014) is taking place, which may impact outcome.

While considering the current study findings, a few limitations should be noted. As can be seen in Figure 1, scores of work performance and therapeutic alliance both suffered from a limited range. On the WBI measure of work performance, scores generally ranged between 15 and 17 indicating mostly average scores on working performance. Given this restricted range, coefficient betas look fairly small. Future studies should make use of an instrument that is more sensitive to change. It should be noted, however, that WBI scales

are scored on a 5-point scale (1 = 'persistent problem area' to 5 = 'frequent area of strength'). Given the standard deviations of the predictors, 1-point increases are very common, and we are relatively confident that effects are thus clinically relevant. Furthermore, the sample size is rather modest, and women are heavily underrepresented. This limited sample size also precluded investigating whether the three different types of treatment were differentially influenced by TA. Finally, data were collected around ten years ago, and more recent samples should be drawn.

With these limitations in mind, the current study has important clinical implications. The first is that in general, better alliance scores are associated with better outcomes in the intervention, highlighting the importance of investing in the alliance. But the alliance from the client perspective does not need to remain as high over time. Our data suggest that a reduction in therapeutic alliance ratings from the client may not necessarily damage outcomes. Secondly, our data further challenge the assumption that only client scores are predictive of therapy outcomes such as work rehabilitation, given how therapist ratings over time were a significant predictor of outcome. Clinicians are advised to routinely assess the therapeutic alliance from both client and therapist perspectives and calculate the discrepancy between them. Growing discrepancy may indicate the need for a session dedicated to mutual reflections on the tasks and goal of the therapy, as well as the affective bond. It is possible that such a session may have large effects: the client would notice that the therapist is aware (and takes seriously) their perspective on the relationship and is open to feedback. Future work could focus on the question whether better therapeutic alliance is also related to greater work enjoyment, or lower levels of work-related stress.

Conflicts of interest

All authors declare no conflict of interest.

Author contributions

Steven de Jong (Conceptualization; Formal analysis; Software; Supervision; Validation; Visualization; Writing – original draft; Writing – review & editing) Ilanit Hasson-Ohayon (Conceptualization; Methodology; Supervision; Writing – review & editing) Lavi Rotenberg (Writing – review & editing) Sarah Carter (Formal analysis; Methodology; Writing – review & editing) Stynke Castelein (Writing – review & editing) Paul Lysaker (Conceptualization; Funding acquisition; Investigation; Methodology; Project administration; Supervision; Writing – review & editing.

Data Availability Statement

Scripts and syntaxes used in analyses will be made freely available via the author's website upon publication. The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

References

Atzil-Slonim, D., Bar-Kalifa, E., Rafaeli, E., Lutz, W., Rubel, J., Schiefele, A. K., & Peri, T. (2015). Therapeutic bond judgments: Congruence and incongruence. *Journal of Consulting and Clinical Psychology*, *83*, 773–784. https://doi.org/10.1037/ccp0000015

Bachelor, A. (2013). Clients' and therapists' views of the therapeutic alliance: Similarities, differences and relationship to therapy outcome. *Clinical Psychology and Psychotherapy*, *20* (2), 118–135. https://doi.org/10.1002/cpp.792

Barton, K. (2019). *MuMIn: Multi-Model Inference*. Retrieved from https://cran.r-project.org/packa ge=MuMIn

Bio, D. S., & Gattaz, W. F. (2011). Vocational rehabilitation improves cognition and negative symptoms in schizophrenia. *Schizophrenia Research*, *126*(1–3), 265–269. https://doi.org/10. 1016/j.schres.2010.08.003

Bliese, P. D., & Ployhart, R. E. (2002). Growth modeling using random coefficient models: Model building, testing, and illustrations. *Organizational Research Methods*, *5*(4), 362–387. https:// doi.org/10.1177/109442802237116

Bordin, E. S. (1979). The generalizability of the psychoanalytic concept of the working alliance. *Psychotherapy: Theory, Research & Practice*, *16*(3), 252–260. https://doi.org/10.1037/ h0085885

Bryson, G., Bell, M. D., Lysaker, P., & Zito, W. (1997). The Work Behavior Inventory: A scale for the assessment of work behavior for people with severe mental illness. *Article in Psychiatric Rehabilitation Journal*, (July). https://doi.org/10.1037/t25132-000

Bryson, G. J., Lysaker, P. H., & Bell, M. D. (2002). Quality of life benefits of paid work activity in schizophrenia. *Schizophrenia Bulletin*, *28*(2), 249–257. https://doi.org/10.1093/oxfordjourna ls.schbul.a006935

Chen, R., Atzil-Slonim, D., Bar-Kalifa, E., Hasson-Ohayon, I., & Refaeli, E. (2016). Therapists' recognition of alliance ruptures as a moderator of change in alliance and symptoms. *Psychotherapy Research*, *28*, 560–570. https://doi.org/10.1080/10503307.2016.1227104

Davidson, M., Kapara, O., Goldberg, S., Yoffe, R., Noy, S., & Weiser, M. (2016). A nation-wide study on the percentage of schizophrenia and bipolar disorder patients who earn minimum wage or above. *Schizophrenia Bulletin*, *42*, 443–447. https://doi.org/10.1093/schbul/sbv023

Davis, L. W., & Lysaker, P. H. (2007). Therapeutic alliance and improvements in work performance over time in patients with schizophrenia. *Journal of Nervous and Mental Disease*, *195*(4), 353–357. https://doi.org/10.1097/01.nmd.0000261954.36030.a1

Field, A., Miles, J., & Field, Z. (2013). *Discovering statistics using R*. Los Angeles, CA: Sage.

First, M. B., & Gibbon, M. (2004). The Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) and the Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II). In *Comprehensive handbook of psychological assessment, Vol. 2: Personality assessment* (pp. 134–143). Hoboken, NJ: John Wiley & Sons Inc.

Fisher, H., Atzil-Slonim, D., Bar-Kalifa, E., Rafaeli, E., & Peri, T. (2016). Emotional experience and alliance contribute to therapeutic change in psychodynamic therapy. *Psychotherapy*, *53*(1), 105–116. https://doi.org/10.1037/pst0000041

Frank, A. F., & Gunderson, J. G. (1990). The role of the therapeutic alliance in the treatment of schizophrenia: Relationship to course and outcome. *Archives of General Psychiatry*, *47*(3), 228–236. https://doi.org/10.1001/archpsyc.1990.01810150028006

Goldsmith, L. P., Lewis, S. W., Dunn, G., & Bentall, R. P. (2015). Psychological treatments for early psychosis can be beneficial or harmful, depending on the therapeutic alliance: an instrumental variable analysis. *Psychological Medicine*, *45*(2010), 1–9. https://doi.org/10.1017/ S003329171500032X

Hasson-Ohayon, I., Jong, S., Igra, L., Carter, S. A., Faith, L. A., & Lysaker, P. (2021). Longitudinal changesin therapeutic alliance with people with psychosis: Relationship between client and therapist assessments. *Clinical Psychology and Psychotherapy*. https://doi.org/10.1002/cpp. 2572

Hasson-Ohayon, I., Kravetz, S., & Lysaker, P. H. (2017). The special challenges of psychotherapy with persons with psychosis: Intersubjective metacognitive model of agreement and shared meaning. *Clinical Psychology and Psychotherapy*, *24*(2), 428–440. https://doi.org/10.1002/ cpp.2012

Horvath, A. O., & Greenberg, L. S. (1986). Development of the working alliance inventory. *Ther Psychotherapeutic Process: A Research Handbook*, *36*(2), 529–556.

Horvath, A. O., & Symonds, B. D. (1991). Relation between working alliance and outcome in psychotherapy: A meta-analysis. *Journal of Counseling Psychology*, *38*(2), 139–149. https://doi.org/10.1037/0022-0167.38.2.139

Kivlighan, D. M. (2007). Where is the relationship in research on the alliance? Two methods for analyzing dyadic data. *Journal of Counseling Psychology*, *54*(4), 423–433. https://doi.org/10.1037/0022-0167.54.4.423

Kukla, M., Bell, M. D., & Lysaker, P. H. (2018). A randomized controlled trial examining a cognitive behavioral therapy intervention enhanced with cognitive remediation to improve work and neurocognition outcomes among persons with schizophrenia spectrum disorders. *Schizophrenia Research*, *197*, 400–406. https://doi.org/10.1016/j.schres.2018.01.012

Kukla, M., & Bond, G. R. (2009). The working alliance and employment outcomes for people with severe mental illness enrolled in vocational programs. *Rehabilitation Psychology*, *54*(2), 157–163. https://doi.org/10.1037/a0015596

Kukla, M., Salyers, M. P., Strasburger, A. M., Johnson-Kwochka, A., Amador, E., & Lysaker, P. H. (2019). Work-focused cognitive behavioral therapy to complement vocational services for people with mental illness: Pilot study outcomes across a 6-month posttreatment follow-up. *Psychiatric Rehabilitation Journal*, *42*(4), 366–371. https://doi.org/10.1037/prj0000365

Laws, H. B., Constantino, M. J., Sayer, A. G., Klein, D. N., Kocsis, J. H., Manber, R., . . . Arnow, B. A. (2017). Convergence in patient–therapist therapeutic alliance ratings and its relation to outcome in chronic depression treatment. *Psychotherapy Research*, *27*(4), 410–424. https://doi.org/10.1080/10503307.2015.1114687

Lüdecke, D. (2018). *sjPlot: Data Visualization for Statistics in Social Science*. Retrieved from https://cran.r-project.org/package=sjPlot

Lysaker, P. H., Bond, G., Davis, L. W., Bryson, G. J., & Bell, M. D. (2005). Enhanced cognitive-behavioral therapy for vocational rehabilitation in schizophrenia: Effects on hope and work. *Journal of Rehabilitation Research and Development*, *42*(5), 673–681. https://doi.org/10.1682/JRRD.2004.12.0157

Lysaker, P. H., Davis, L. W., Buck, K. D., Outcalt, S., & Ringer, J. M. (2011). Negative symptoms and poor insight as predictors of the similarity between client and therapist ratings of therapeutic alliance in cognitive behavior therapy for patients with schizophrenia. *Journal of Nervous and Mental Disease*, *199*, 191–195. https://doi.org/10.1097/NMD.0b013e31820c73eb

Marmarosh, C. L., & Kivlighan, D. M. (2012). Relationships among client and counselor agreement about the working alliance, session evaluations, and change in client symptoms using response surface analysis. *Journal of Counseling Psychology*, *59*(3), 352–367. https://doi.org/10.1037/a0028907

Mervis, J. E., Fiszdon, J. M., Lysaker, P. H., Nienow, T. M., Mathews, L., Wardwell, P., . . . Choi, J. (2017). Effects of the Indianapolis Vocational Intervention Program (IVIP) on defeatist beliefs, work motivation, and work outcomes in serious mental illness. *Schizophrenia Research*, *182*, 129–134. https://doi.org/10.1016/j.schres.2016.10.036

Nakagawa, S., & Schielzeth, H. (2013). A general and simple method for obtaining R^2 from generalized linear mixed-effects models. *Methods in Ecology and Evolution*, *4*(2), 133–142. https://doi.org/10.1111/j.2041-210x.2012.00261.x

Nelson, B., Sass, L. A., Thompson, A., Yung, A. R., Francey, S. M., Amminger, G. P., & McGorry, P. D. (2009). Does disturbance of self underlie social cognition deficits in schizophrenia and other psychotic disorders? *Early Intervention in Psychiatry*, *3*(2), 83–93. https://doi.org/10.1111/j.1751-7893.2009.00112.x

Pinheiro, J., Bates, D., DebRoy, S., & Sarkar, D. (2019). *nlme: Linear and Nonlinear Mixed Effects Models*. Retrieved from https://cran.r-project.org/package=nlme

R Core Team. (2018). *R: a language and environment for statistical computing*. Retrieved from https://www.rproject.org/

Roe, D., Mashiach-Eizenberg, M., & Lysaker, P. H. (2011). The relation between objective and subjective domains of recovery among persons with schizophrenia-related disorders. *Schizophrenia Research*, *131*(1–3), 133–138. https://doi.org/10.1016/j.schres.2011.05.023

Safran, J. D., & Kraus, J. (2014). Alliance ruptures, impasses, and enactments: A relational perspective. *Psychotherapy*, *51*(3), 381–387. https://doi.org/10.1037/a0036815

Safran, J. D., Muran, J. C., & Eubanks-Carter, C. (2011). Repairing alliance ruptures. *Psychotherapy*, *48*(1), 80–87. https://doi.org/10.1037/a0022140

Shattock, L., Berry, K., Degnan, A., & Edge, D. (2018). Therapeutic alliance in psychological therapy for people with schizophrenia and related psychoses: A systematic review. *Clinical Psychology and Psychotherapy*, *25*(1), e60–e85. https://doi.org/10.1002/cpp.2135

Silverstein, S. M., & Bellack, A. S. (2008). A scientific agenda for the concept of recovery as it applies to schizophrenia. *Clinical Psychology Review*, *28*(7), 1108–1124. https://doi.org/10.1016/j.cpr.2008.03.004

Tracey, T. J., & Kokotovic, A. M. (1989). Factor structure of the working alliance inventory. *Journal of Consulting and Clinical Psychology*, *1*(3), 207–210. https://doi.org/10.1037/1040-3590.1.3.207

Twamley, E. W., Jeste, D. V., & Lehman, A. F. (2003). Vocational rehabilitation in schizophrenia and other psychotic disorders: A literature review and meta-analysis of randomized controlled trials. *The Journal of Nervous and Mental Disease*, *191*, 515–523. https://doi.org/10.1097/01.nmd.0000082213.42509.69

van Weeghel, J., Bergmans, C., Couwenbergh, C., Michon, H., & de Winter, L. (2020). Individual placement and support in the Netherlands: Past, present, and future directions. *Psychiatric Rehabilitation Journal*, *43*(1), 24–31. https://doi.org/10.1037/prj0000372

van Weeghel, J., van Zelst, C., Boertien, D., & Hasson-Ohayon, I. (2019). Conceptualizations, assessments, and implications of personal recovery in mental illness: A scoping review of systematic reviews and meta-analyses. *Psychiatric Rehabilitation Journal*, *42*(2), 169–181. http://dx.doi.org/10.1037/prj0000356

Vogel, J. S., Bruins, J., Halbersma, L., Lieben, R. J., Jong, S., Gaag, M., & Castelein, S. (2020). Measuring personal recovery in people with a psychotic disorder based on CHIME: A comparison of three validated measures. *International Journal of Mental Health Nursing*, *29*, 808–819. https://doi.org/10.1111/inm.12711

Zilcha-Mano, S., Snyder, J., & Silberschatz, G. (2017). The effect of congruence in patient and therapist alliance on patient's symptomatic levels. *Psychotherapy Research*, *27*(3), 371–380. https://doi.org/10.1080/10503307.2015.1126682

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), 568–578. https://doi.org/10.1037/cou0000106

Supporting Information

The following supporting information may be found in the online edition of the article:

Table S1. Mean scores of therapeutic alliance (WAI), grouped by number of missed weeks of work (WBI missing).