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Congruence of Patient Takeaways and Homework Assignment Content Predicts Homework
Compliance in Psychotherapy

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Jacqueline B. Persons and Connie Fee are now at the Oakland Cognitive Behavior Therapy Center. Anthony L. Miles is now at the Wright Institute.

The authors disclose no competing interests. A version of this study was presented at the annual convention of the Association for Behavioral and Cognitive Therapies in San Diego, California in November 2017. We thank Polina Eidelman for contributing data, Amanda Gale-Bando for providing a case example, Michael Edge for consulting on data analytics, Janie Hong for her work developing the SAFF, and the participants who contributed data to this study.

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Abstract

Homework is generally considered an essential part of psychotherapy. The present study tested the hypothesis that patients were more likely to complete homework assignments when the content of the assignments was more congruent with content the patient reported wanting to remember from the session (patient takeaways). The study relied on data collected in 541 sessions of individual naturalistic cognitive behavioral therapy provided to 41 patients in a private practice setting and who completed a feedback form each session that recorded the content of the homework assignments for the session, patient takeaways from the session, and homework completion. Congruence was determined by raters who evaluated the match between homework content and patient takeaways. Results of generalized linear mixed modeling showed, as predicted, that congruence between homework assignment content and takeaways was statistically significantly associated with homework compliance. This finding suggests that therapists may be able to improve homework compliance by soliciting feedback about what the client found important about the session and then assigning homework consistent with that information.

Keywords: homework compliance, patient feedback, cognitive behavioral therapy

Congruence of Patient Takeaways and Homework Assignment Content Predicts Homework Compliance in Psychotherapy

Homework is generally considered an essential part of psychotherapy. Most therapists, regardless of theoretical orientation, report assigning tasks for patients to complete between sessions (Kazantzis, Lampropoulos, & Deane, 2005). Homework compliance in psychotherapy has been found to be associated with improved treatment outcomes across diagnoses and empirically-supported treatments (i.e., Kazantzis et al., 2018; Mausbach, Moore, Roesch, Cardenas, & Patterson, 2010).

However, psychotherapists struggle to obtain high homework compliance from their clients. Only 7% of practicing psychologists estimate their clients as having high homework compliance, whereas 20% estimate that their clients have low homework compliance (Kazantzis et al., 2005). Research that can help clinicians improve homework compliance is needed.

Researchers have identified several factors that are positively associated with homework compliance. Motivation and expectancy of change are positively related to homework compliance. Westra and Dozois (2006) found that patients who were randomly assigned to receive motivational interviewing before treatment had greater homework compliance than those who did not receive motivational interviewing. Westra, Dozois, and Marcus (2007) reported that early homework compliance mediated the relationship between change expectancy and outcome. Patients are also more likely to complete homework assignments when the rationale for the assignments is clear and when the content of the homework assignment matches the patient's view of his or her problems (Conoley, Padula, Payton, & Daniels, 1994; Scheel, Hanson, & Razzhavaikina, 2004). Therapist competence in reviewing homework is also correlated with

homework compliance (Bryant, Simons, & Thase, 1999; Weck, Richtberg, Esch, Höfling, & Stangier, 2013). Dong, Zhao, Ong, & Harvey (2017) showed that patient recall of specific cognitive therapy contents predicts homework compliance.

Clinical writers have offered recommendations for strategies to improve homework compliance. Several recommend assigning homework that is tied to the content of the session (Kazantzis & Lampropoulos, 2002; Nelson, Castonguay, & Barwick, 2006; Tang & Kreindler, 2017; Tompkins, 2002). Although this idea of *congruency to therapy* has been hypothesized to be an important factor for increasing homework compliance, whether congruency is associated with increased homework compliance rates has not been empirically tested.

We conducted the present study to test the hypothesis that homework compliance would be higher when assignments were more congruent with content from the session that patients reported wanting to remember (patient takeaways) than when assignments were less congruent with patient takeaways. To test this hypothesis, we collected data about homework compliance and congruence of homework assignments with patient takeaways from outpatients who received naturalistic cognitive behavior therapy in a private practice setting. We predicted that patients would be more likely to complete their homework when the assignments were more congruent with session content the patient reported wanting to remember. We view this study as a preliminary examination of the degree to which homework compliance is related to congruence of homework assignment content and patient takeaways from the session.

In this study, we examined quantity of homework completed, not quality. The issue of assessing quality versus quantity of homework completed has attracted considerable attention from researchers (Dozois, 2010; Kazantzis, Brownfield, Mosely, Usatoff, & Flighty, 2017; Kazantzis, Whittington, & Dattilio, 2010). We chose to assess quantity rather than quality for

several reasons. First, we know quantity of homework completed is an important aspect of treatment, as it has been shown to be an important predictor of treatment outcome (Kazantzis et al., 2016). In fact, Rees, McEvoy, and Nathan (2005) found that the amount of homework completed was a better predictor of outcome than the quality of homework completed. Second, we believed we could assess quantity more reliably than quality in the context of the naturalistic clinical setting in which we conducted the study.

We collected the data for the current study in the context of routine clinical practice (Castonguay, Barkham, Lutz, & McAleavey, 2013). The primary advantage of this research strategy is its high external validity. This study's high external validity helps address the low rate of dissemination and implementation of research findings. Many clinicians have misgivings about implementing evidence-based practices. For example, clinicians often view results from clinical trials conducted in research settings as not generalizable to their clinical practice because the samples studied in the trials are not representative of those treated in clinical practice (Stewart, Stirman, & Chambless, 2012). Conducting studies in the context of routine care addresses this concern of external validity and may lead to results that practitioners are more willing to adopt (Weisz et al., 2014).

Method

Participants

Participants were 41 outpatients who received psychotherapy at one of three private practices in the San Francisco Bay area. The majority of participants were female ($N = 30$, 73.2%), White ($N = 34$, 82.9%), married ($N = 21$, 51.2%), and employed full-time ($N = 24$, 58.5%). Participants averaged 39.8 years old ($SD = 12.4$) and had a mean of 17.4 years of education ($SD = 2.1$). The modal participant sought treatment for some sort of mood disorder (N

= 21, 51.2%) or anxiety ($N = 17$, 41.5%) disorder. Twelve participants (29.3%) had more than one disorder.

Participants in this study were drawn from participants in an unpublished study (the SAFF study) examining the relationship between use of the Session Assignment and Feedback Form (SAFF, described below) and symptom change on the Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995) during treatment. Participants were selected for the SAFF study if they provided informed consent to participate in the study and met the following selection criteria: the participant was a new patient who began their first course of treatment with the participating therapist between 2012 and 2016, scored above the normal range on any subscale of the DASS at intake, and completed the DASS at least twice during the course of treatment. Therapists collected participant data for the first 30 sessions of treatment or until the end of treatment, whichever came first. We selected the figure 30 because we believed that most symptom change would appear relatively early in treatment. Fifty-nine participants met these inclusion criteria for participation in the SAFF study.

Forty-one of the patients who met the selection criteria for the SAFF study participated in the current study. Six participants were excluded because they did not complete the homework sections of the SAFF because one of the therapists participating in the study elected not to use the SAFF to record homework assignment and compliance for her patients; ten participants were excluded because, although the patient's therapist invited the patient to use the SAFF in the course of his/her treatment, the patient elected not to do so; and two patients were excluded because they recorded no takeaways from any session on the form.

Measures

Measures of homework assignment content, homework assignment completion, and patient takeaways were collected during treatment on the SAFF (available online at <https://perma.cc/K78V-BSSM>). In section I of the SAFF, the patient and/or therapist recorded the homework assignments for the session and, during the following week or in the following session, recorded whether each assignment had been completed (see Figure 1).

Insert Figure 1 about here

In section II, patients recorded their takeaways from the therapy session in response to the question on the form, which asks “What are 1-2 things you want to remember from session?” The instructions ask patients to record their responses immediately after session, although sometimes the therapist encouraged the patient to note takeaways during the session (see Figure 2).

Insert Figure 2 about here

Information about participants’ demographics (age, gender, amount of education received), diagnoses, and the session number in which each SAFF was collected were culled from the clinical record by the treating clinician.

Procedure

Treatment and diagnosis. Six therapists holding doctorate degrees in clinical psychology provided idiographic, case formulation-based cognitive behavior therapy, integrating

standard CBT and third-wave approaches like ACT and DBT as needed, to all participants.

Therapists did not adhere strictly to empirically-supported protocols; instead, they used cognitive-behavioral interventions to target transdiagnostic mechanisms (e.g., perfectionism, intolerance of uncertainty) they identified in an idiographic case formulation (Persons, 2008).

Each therapist assigned diagnoses to her patients using her usual clinical assessment procedures.

Therapists were all female and ranged in age from their early 30s to early 60s. Five therapists were licensed psychologists; the sixth therapist was unlicensed and practiced under the supervision one of the other five. The five licensed therapists had been practicing for 5 to 30 years.

SAFF completion. Therapists and patients completed the SAFF using the following procedures. Either patient or therapist wrote down homework assignments on the SAFF during the session. During or immediately after the session, the patient wrote down session takeaways. During the week, the patient checked off the assignments s/he had completed, or the patient did this with the therapist in the following session.

Therapists did not change how they assigned the SAFF to patients for the purposes of this study, as this study was only conceived of after all data had been collected for the SAFF study described above. Data for the present study were culled from the completed SAFF forms by the research team after the patient's treatment was completed.

Rating homework compliance. We considered that the patient completed the homework assignment written in Section I of the SAFF if there was at least one checkmark (or other clear mark) indicating that the participant completed the assignment at least once. We counted both the number of homework items assigned and the number of those assignments that had been completed.

One investigator (A. J.) rated homework compliance for all SAFF forms. To determine interrater reliability, the SAFF forms were numbered, and another investigator (C. F.) took a random sample of 10% of the SAFF and rated homework compliance independently, blind to the original ratings. Investigators agreed on 88.9% of number of homework items assigned and on 85.2% of number of assignments completed.

Rating congruence of session takeaways and homework assignment content. We defined thematic or conceptual similarity between session takeaways and the content of the homework assignment as *congruence*. We rated a homework assignment's content as congruent with the patient takeaways only if the similarities between the two would be obvious even to a reader unfamiliar with the content of the therapy session, and the similarity "jumped off the page." For example, if a patient reported that s/he wanted to remember "*the importance of being social*," then the homework assignment "*call Susan to catch up*" would be considered congruent, because both clearly relate to social interaction. A homework assignment of "*interoceptive exercises*" would not be congruent, because no clear relationship exists between social interaction and interoceptive exercises.

To determine the level of congruence of homework assignment content to session takeaways, two of the investigators (A. J. and A. M.) compared each homework assignment to all patient takeaways for that session. If the assignment obviously related to any part of the session takeaways, that homework item was considered congruent. Congruence for the session was rated Low, Medium or High, depending on the proportion of homework assignments that were congruent with the takeaways for the session: *Low* (0% - 25% of homework assignments congruent), *Medium* (26% - 74% of homework assignments congruent), or *High* (75% - 100% of

homework assignments congruent). For example, if 3 of the 4 homework assignments for the session were congruent with the takeaways, then congruence for that session was rated as High.

The two raters developed and refined their coding system by practicing on SAFF forms obtained from patients who were excluded from the present study. They then independently coded each SAFF completed by each participant. Raters agreed on 90.1% of ratings of congruence; disagreements were resolved by discussion. Ratings of congruence were blind to ratings of homework compliance. We collapsed the percentage of congruent homework items into *Low*, *Medium*, or *High* bins to ensure adequate interrater reliability. We found that using a larger number of bins lowered interrater reliability beyond an acceptable level, as did using equal thirds.

The study was approved by the Behavioral Health Research Collective Institutional Review Board.

Data Analysis

We analyzed the relationship between homework completion and the congruence of takeaways and homework assignment content using generalized linear mixed modeling, a standard statistical procedure used to account for repeated measures within participants. This analytic method was necessary because there were repeated observations (data from multiple sessions) nested within each participant. The main independent variable was level of congruence of patient session takeaways and homework assignment content. The main dependent variable was homework compliance. Because homework compliance was a count variable (the number of homework assignments completed after a session), we constructed models considering the dependent variable as originating from a Poisson or Poisson-like distribution rather than a normal distribution. We used the total number of homework assignments given by the therapist

each session as an offset variable in order to treat each completed homework assignment count like a proportion. The offset variable ensured that one homework assignment completed out of two assigned represented a higher completion level than one assignment completed out of five assigned.

Generalized linear mixed models including and excluding a random slope for each participant, a random intercept for each participant, and accounting for common assumption violations (over-dispersion, zero-inflation) were examined as potential model candidates. Model fit was assessed by significance testing, Akaike Information Criterion (AIC), and Bayesian Information Criterion (BIC), where a difference of 2 or more in AIC or BIC indicated a significantly better fit (Burnham & Anderson, 2004). We report the model(s) with best fit and models that include any statistically significant covariates. Covariates examined were participant diagnosis, age, gender, amount of education received, which therapist a participant saw (therapist identity), and the number of the session during the patient's treatment that that particular SAFF form came from (session number). We also considered the model in which session data nested within each participant is again nested within their treating therapist, rather than considering therapist identity as a covariate. We conducted the analyses in R, Version 3.4.1 using the lme4 (Bates, Mächler, Bolker, & Walker, 2015), glmmADMB (Bolker, Skaug, & Laake, 2017), R2admb (Fournier et al., 2012), geopack (Højsgaard, Halekoh, & Yan, 2006), and ggplot2 (Wickham, 2009) packages.

Results

Descriptive analyses

Analyses were conducted on 541 SAFF forms completed by the 41 participants. Participants completed, on average, 13.2 SAFF forms that included both homework assignments

and session takeaways ($SD = 7.24$, median = 14, max = 27, min = 1 per participant). Participants completed an average of just over 20 sessions of treatment, meaning that for about 7 sessions per participant, either no SAFF form was assigned or received by the therapist, or the returned SAFF did not include homework assignments or takeaways.

Table 1 presents the number of homework items assigned and completed across all participants' SAFF forms organized by congruence level. Figure 3 illustrates the proportion of homework assignments completed, by congruence level, across all SAFF forms.

Insert Table 1 and Figure 3 about here

Best-fit model

The model with the best fit as determined by significance test and AIC (although not BIC) was a Poisson-family model with an offset term, including a different slope and intercept for each participant (random slope and random intercept).¹ In this model, as we predicted, the fixed effect of congruence level of homework assignment content and patient takeaways content on homework compliance was statistically significant ($\hat{\beta}_1 = 0.65$, $SE(\hat{\beta}_1) = 0.11$, $p < 0.001$, 95% $CI = [0.45, 0.91]$). In a Poisson-family model, a fixed effect of 0.65 corresponds with an increase of $e^{0.65} \approx 1.91$ more homework assignments completed on average per increase in congruence level. Thus, for every increment increase in congruence level (e.g., from Low to Medium or from Medium to High), this model suggests that patients completed an average of 1.91 more homework assignments in the session. This estimate of effect size views 0.65 as the slope that best fits a straight line running across three equally-spaced levels in the independent variables – that is, it considers Low, Medium, and High as equally-spaced levels of an interval

variable. We chose to consider the congruence variable as an interval variable in order to simplify the interpretation of the magnitude of the relationship between congruence and homework compliance.

All other models considered also showed a statistically significant positive relationship between congruence and homework compliance. This fact indicates that our results are not sensitive to the exact specifications of the best-fit model. BIC marginally preferred the model excluding the random slope for each participant; the model excluding the random slope had similar results to those presented here. AIC and BIC agreed in favoring models that did not accommodate overdispersion or zero-inflation. As a final check of the assumptions made in a GLM model, we fit a generalized estimating equation (GEE) with the same variables; the GEE showed similar results. The similar effect found using the GEE also strengthened our confidence in the appropriateness of model choice.

Analysis of covariates

We examined several covariates to evaluate whether they were associated with homework compliance. We examined participant diagnosis, age, gender, and amount of education received. We also examined session number, in order to evaluate whether homework compliance was greater at some points in treatment than others. We included all these covariates as independent variables within the best-fit model. With all covariates included, the model of best fit was a Poisson-family model with an offset term including only a random intercept; random slope did not improve model fit. None of the covariates in this model had a statistically significant fixed effect.

We also examined therapist identity, that is, which therapist was providing the treatment, to determine whether some therapists obtained higher rates of homework compliance than others.

We did this in two ways: one, by considering therapist identity as a categorical fixed effect, and two, by considering therapist identity as another level in the model under which participant and session data from each participant were nested. We found no significant fixed effect of therapist identity, and the model that included another level for therapist identity significantly worsened model fit (the difference in AIC = 4.1, BIC = 17).

Discussion

We found, as we predicted, that patients were more likely to complete homework assignments that were more congruent with content the patient reported wanting to remember from the session. This finding provides some preliminary empirical support for clinical guidelines suggesting that matching homework assignments to the content of the therapy session can be an important factor in increasing homework compliance (Tang & Kreindler, 2017; Tompkins, 2002).

Our finding is consistent with other factors that have been shown to be related to homework compliance. Conoley et al. (1994) found that patients were more likely to complete homework tasks that matched their problem. When the homework assignment is congruent with material the patient wants to remember, we would assume the assignment matches the patient's problems. Scheel et al. (2004) reviewed studies showing that homework compliance was positively related to client acceptability of homework recommendations, where acceptability was defined as the client's judgment about the worth of the assignment. Homework that is congruent with patient takeaways from the session would likely be high in client acceptability. Kazantzis and Shinkfield (2007) suggest that patient motivation to complete homework is mediated by the perceived costs and benefits of the task. Homework tasks that are congruent with what the

patient wants to remember are likely perceived by the client as high in benefit. At root, these researcher-identified factors all seem to reflect different takes on the question “*Does the patient believe the assignment will be helpful to complete and therefore feel motivated to complete the assignment?*” Future studies can move the field forward by investigating which of these closely related factors is most tightly related to homework compliance: congruence of homework assignment content to patient takeaways, matching of homework assignment content to patient problems, acceptability of homework assignments, and relative costs and benefits of completing the assignment.

Notice that our measure of congruence relies on *patient* feedback about what they want to remember from the session, rather than *therapist* judgment about what is important for the patient to work on. Patient and therapist perspectives about what is important to remember can differ. If a therapist assigns homework based on what he or she believes was the focus of the session, but the patient has a different takeaway from the session, the patient may be less motivated to complete the assignment. Differing patient and therapist perspectives might explain why a null correlation has been found between homework compliance and how “well” therapists assigned homework, including matching homework to what was discussed in session, when therapists or independent observers recorded what they believed was discussed in session (e.g., Addis & Jacobson, 2000; Bryant et al. 1999). Our results provide preliminary support for asking the *patient* what he or she took away from the session before assigning homework. Future research might examine the effects on homework compliance of patient-therapist consensus about important session content, and the effects on compliance of eliciting the patient’s feedback about session content as part of the process of assigning homework.

The logical clinical implication of our finding is that therapists may be able to increase their patients' homework compliance by asking what they took from the session and using that information to guide the homework assignment. We have been experimenting with this idea. For example, one of our colleagues planned, based on the fact that the main thing she had taught in the session was the importance of feeling instead of avoiding emotions, to assign homework related to the DBT skills of Nonjudgment and Mindfulness of Current Emotion. However, when she asked the patient to state the main take-home message she had gotten from the session, the patient reported that the idea she found most helpful was "accepting reality as it is rather than trying to make it different." Based on this feedback from the patient, the therapist changed her homework assignment to practicing the DBT Skill of Radical Acceptance using the DBT worksheet. At the following session, the patient had completed the worksheet and reported some examples of practicing radical acceptance. Although we do not know whether the patient would have completed the Nonjudgment and Mindfulness homework had the therapist assigned it, we do know that the patient completed the homework that was congruent with her main takeaway from the session and reported it was useful. This example illustrates the different perspectives the therapist and patient may have when reflecting on the same therapy session and highlights the importance of eliciting *patient* takeaways at the end of the session.

The strategy of working to improve homework compliance by using the patient's feedback about what she found most helpful about the session to guide the homework assignment is a relatively simple strategy that any psychotherapist can use. It takes little session time and comes with the side benefit of receiving useful patient feedback. Obtaining feedback about the patient's main takeaways can also strengthen the patient-therapist alliance, another

therapy variable associated with improved therapy outcome (i.e., Falkenström, Ekeblad, & Holmqvist, 2016; Horvath & Symonds, 1991).

The present study is limited in several ways, and is best be viewed as a preliminary investigation in need of replication. We studied a relatively small sample of mostly white, well-educated women receiving treatment from doctoral-level cognitive behavioral therapists in private practice settings in the San Francisco Bay Area. Study participants were not randomly selected from the patients in the practices of the participating therapists, and this fact may have introduced sample selection biases that affected our results. We did not have sufficient outcome data to test the hypothesis that homework compliance in our sample was related to better treatment outcome, as we would expect. The lack of an experimental design prevented us from establishing a causal relationship between congruence and compliance. The strategies we used to rate and categorize congruence and compliance may be difficult to replicate. Because the study was conducted in a naturalistic clinical setting, diagnoses were obtained by each therapist using his/her preferred strategies, rather than by research-quality diagnostic tools, and we cannot provide information on the exact nature of the treatment provided or the homework that was assigned, as these were determined by the therapists in whatever manner they saw fit.

These limitations, however, are tied to one of the study's greatest strengths: its high external validity. The participants in our study were patients seeking treatment for a wide range of disorders and were not recruited for the study. The therapists were practitioners with their own private practice who provided idiographic, case formulation-based therapy, not researchers implementing a manualized treatment, and our sample included multiple-diagnosis patients. Almost 30% of our sample had comorbid disorders, representative of the estimated 27.7% of people in the United States who experience two or more disorders (Kessler et al., 2005). The fact

that the data were collected in a real-world clinical setting suggests our findings are generalizable to other private practice settings. By studying usual care, our study avoids the “implementation cliff” and “low relevance of most clinical research to actual practice” often afflicting evidence-based treatment implementation (i.e., Weisz, Ng, & Bearman, 2014). And our research strategy is in line with calls in the literature to conduct practice-oriented research (i.e., Castonguay et al., 2013) and collect practice-based evidence (i.e., Barkham, Hardy, & Mellor-Clark, 2010; Persons, 2018; Weisz et al., 2014).

Finally, an important strength of our study is that we studied a “kernel” (homework) rather than an “ear” (a complete protocol) (Weisz, Ugueto, Herren, Afienko, & Rutt, 2011). Research has found that clinicians are more willing to integrate components of treatment protocols into their practice than adopt a whole new therapy (Cook, Schnurr, Biyanova, & Coyne, 2009; Stewart et al., 2012). The empirically-supported suggestion about how to assign homework that we provide here is an excellent example of a treatment kernel (rather than an ear, or complete treatment) that may be relatively easy for clinicians who are striving to provide evidence-based care to implement into their treatment as usual (Weisz et al., 2011). Homework, as an almost universal therapy component, is uniquely situated as both global (a part of many therapies) and not prescribed (therapists have great flexibility to choose homework assignment content as they see fit). As such, the kernel of homework is a transdiagnostic intervention that is applicable across theoretical orientations and therapist discipline.

Footnote

¹ The best-fit model uses the following formula:

$$\log(E(Y_{ij}|x_{ij})) = \beta_0 + \beta_{0i} + (\beta_1 + \beta_{1i})x_{ij} + \log(z_{ij})$$

in which Y_{ij} represents the number of homework assignments completed by the i^{th} patient after their j^{th} therapy session, x_{ij} is the rate of congruence on the SAFF form returned after the j^{th} session, β_0 is a fixed intercept, β_{0i} is the difference between the fixed intercept and the i^{th} patient's intercept, β_1 is a fixed slope relating congruence and homework completion, β_{1i} is the difference between the fixed slope representing the main effect of congruence and the i^{th} patient's slope, and z_{ij} is the total number of homework assignments given to patient i after session j . Including the log of z_{ij} with a coefficient of 1 makes the Poisson model analogous to a model for the proportion of homework assignments completed per week.

References

- Addis, M. E., & Jacobson, N. S. (2000). A closer look at the treatment rationale and homework compliance in cognitive-behavioral therapy for depression. *Cognitive Therapy and Research, 24*(3), 313–326. <https://doi.org/10.1023/A:1005563304265>
- Barkham, M., Hardy, G. E., & Mellor-Clark, J. (Eds.). (2010). *Developing and delivering practiced-based evidence: A guide for the psychological therapies*. Chichester, West Sussex, UK: Wiley-Blackwell. <https://doi.org/10.1002/9780470687994>
- Bates, D., Mächler, M., Bolker, B. M., & Walker, S. C. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software, 67*(1), 1–48. <https://doi.org/10.18637/jss.v067.i01>
- Bolker, B., Skaug, H., & Laake, J. (2017). R2admb: “ADMB” to R interface functions. *R Package Version 0.7.16*. Retrieved from <https://cran.r-project.org/package=R2admb>
- Bryant, M. J., Simons, A. D., & Thase, M. E. (1999). Therapist skill and patient variables in homework compliance: Controlling an uncontrolled variable in cognitive therapy outcome research. *Cognitive Therapy and Research, 23*(4), 381–399. <https://doi.org/10.1023/A:1018703901116>
- Burnham, K. P., & Anderson, D. R. (2004). Multimodel inference: Understanding AIC and BIC in model selection. *Sociological Methods and Research, 33*(2), 261–304. <https://doi.org/10.1177/0049124104268644>
- Castonguay, L. G., Barkham, M., Lutz, W., & McAleavey, A. (2013). Practice-oriented research: Approaches and applications. In M. J. Lambert (Ed.), *Bergin and Garfield's Handbook of Psychotherapy and Behavior Change* (pp. 85–133). Hoboken, NJ: John Wiley & Sons, Inc.
- Conoley, C. W., Padula, M. A., Payton, D. S., & Daniels, J. A. (1994). Predictors of client

implementation of counselor recommendations: Match with problem, difficulty level, and building on client strengths. *Journal of Counseling Psychology*, 41(1), 3–7.

<https://doi.org/10.1037/0022-0167.41.1.3>

Cook, J. M., Schnurr, P. P., Biyanova, T., & Coyne, J. C. (2009). Apples don't fall far from the tree: Influences on psychotherapists' adoption and sustained use of new therapies.

Psychiatric Services, 60(5), 671–676. <https://doi.org/10.1176/appi.ps.60.5.671>

Dong, L., Lee, J. Y., & Harvey, A. G. (2017). Memory support strategies and bundles: A pathway to improving cognitive therapy for depression? *Journal of Consulting and Clinical Psychology*, 85(3), 187–199. <https://doi.org/10.1037/ccp0000167>

Psychology, 85(3), 187–199. <https://doi.org/10.1037/ccp0000167>

Dozois, D. J. A. (2010). Understanding and enhancing the effects of homework in cognitive-behavioral therapy. *Clinical Psychology: Science and Practice*, 17(2), 157–161.

<https://doi.org/10.1111/j.1468-2850.2010.01205.x>

Falkenström, F., Ekeblad, A., & Holmqvist, R. (2016). Improvement of the working alliance in one treatment session predicts improvement of depressive symptoms by the next session.

Journal of Consulting and Clinical Psychology, 84(8), 738–751.

<https://doi.org/10.1037/ccp0000119>

Fournier, D. A., Skaug, H. J., Ancheta, J., Ianelli, J., Magusson, A., Maunder, M. N., ... Sibert, J.

(2012). AD model builder: Using automatic differentiation for statistical inference of highly parameterized complex nonlinear models. *Optimization Methods and Software*, 27(2), 233–

249. <https://doi.org/10.1080/10556788.2011.597854>

Højsgaard, S., Halekoh, U., & Yan, J. (2006). The R package geepack for generalized estimating equations. *Journal of Statistical Software*, 15(2), 1–11. <https://doi.org/10.18637/jss.v015.i02>

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>

Kazantzis, N., Brownfield, N. R., Mosely, L., Usatoff, A. S., & Flighty, A. J. (2017). Homework in cognitive behavioral therapy: A systematic review of adherence assessment in anxiety and depression (2011–2016). *Psychiatric Clinics of North America*, 40(4), 625–639.

<https://doi.org/10.1016/j.psc.2017.08.001>

Kazantzis, N., & Lampropoulos, G. K. (2002). Reflecting on homework in psychotherapy: What can we conclude from research and experience? *Journal of Clinical Psychology*, 58(5), 577–585. <https://doi.org/10.1002/jclp.10034>

Kazantzis, N., Lampropoulos, G. K., & Deane, F. P. (2005). A national survey of practicing psychologists' use and attitudes toward homework in psychotherapy. *Journal of Consulting and Clinical Psychology*, 73(4), 742–748. <https://doi.org/10.1037/0022-006X.73.4.742>

Kazantzis, N., Luong, H. K., Usatoff, A. S., Impala, T., Yew, R. Y., & Hofmann, S. G. (2018). The processes of cognitive behavioral therapy: A review of meta-analyses. *Cognitive Therapy and Research*, 42(4), 349–357. <https://doi.org/10.1007/s10608-018-9920-y>

Kazantzis, N., & Shinkfield, G. (2007). Conceptualizing patient barriers to nonadherence with homework assignments. *Cognitive and Behavioral Practice*, 14(3), 317–324.

<https://doi.org/10.1016/j.cbpra.2006.08.003>

Kazantzis, N., Whittington, C., & Dattilio, F. (2010). Meta-analysis of homework effects in cognitive and behavioral therapy: A replication and extension. *Clinical Psychology: Science and Practice*, 17(2), 144–156. <https://doi.org/10.1111/j.1468-2850.2010.01204.x>

Kazantzis, N., Whittington, C., Zelencich, L., Kyrios, M., Norton, P. J., & Hofmann, S. G. (2016). Quantity and quality of homework compliance: A meta-analysis of relations with

outcome in cognitive behavior therapy. *Behavior Therapy*, 47(5), 755–772.

<https://doi.org/10.1016/j.beth.2016.05.002>

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005).

Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey replication. *Archives of General Psychiatry*, 62(6), 593–602.

<https://doi.org/10.1001/archpsyc.62.6.593>

Lambert, M. J. (2001). Research summary on the therapeutic relationship and psychotherapy

outcome. *Psychotherapy: Theory, Research, Practice, Training*, 38(4), 357–361.

<https://doi.org/10.1037/0033-3204.38.4.357>

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states:

Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, 33(3), 335–343.

[https://doi.org/10.1016/0005-7967\(94\)00075-U](https://doi.org/10.1016/0005-7967(94)00075-U)

Mausbach, B. T., Moore, R., Roesch, S., Cardenas, V., & Patterson, T. L. (2010). The relationship

between homework compliance and therapy outcomes: An updated meta-analysis. *Cognitive Therapy and Research*, 34(5), 429–438. <https://doi.org/10.1007/s10608-010-9297-z>

Nelson, D. L., Castonguay, L. G., & Barwick, F. (2006). Directions for the integration of

homework in practice. In N. Kazantzis & L. LLAbate (Eds.), *Handbook of Homework Assignments in Psychotherapy* (pp. 425–444). Boston, MA: Springer.

https://doi.org/10.1007/978-0-387-29681-4_25

Persons, J. B. (2008). *The case formulation approach to cognitive-behavior therapy*. New York,

NY: Guilford Press.

Persons, J. B. (2018). Simultaneous practice and research: A model for conducting research in

- private practice. In R. T. I. Codd (Ed.), *Practice-based research: A guide for clinicians* (pp. 153–169). New York, NY: Taylor & Francis Group.
- Rees, C. S., McEvoy, P., & Nathan, P. R. (2005). Relationship between homework completion and outcome in cognitive behaviour therapy. *Cognitive Behaviour Therapy*, *34*(4), 242–247. <https://doi.org/10.1080/16506070510011548>
- Scheel, M. J., Hanson, W. E., & Razzhavaikina, T. I. (2004). The process of recommending homework in psychotherapy: A review of therapist delivery methods, client acceptability, and factors that affect compliance. *Psychotherapy: Theory, Research, Practice, Training*, *41*(1), 38–55. <https://doi.org/10.1037/0033-3204.41.1.38>
- Stewart, R. E., Stirman, S. W., & Chambless, D. L. (2012). A qualitative investigation of practicing psychologists' attitudes toward research-informed practice: Implications for dissemination strategies. *Professional Psychology: Research & Practice*, *43*(2), 100–109. <https://doi.org/10.1037/a0025694>
- Tang, W., & Kreindler, D. (2017). Supporting homework compliance in cognitive behavioural therapy: Essential features of mobile apps. *JMIR Mental Health*, *4*(2). <https://doi.org/10.2196/mental.5283>
- Tompkins, M. A. (2002). Guidelines for enhancing homework compliance. *Journal of Clinical Psychology*, *58*(5), 565–576. <https://doi.org/10.1002/jclp.10033>
- Weck, F., Richtberg, S., Esch, S., Höfling, V., & Stangier, U. (2013). The relationship between therapist competence and homework compliance in maintenance cognitive therapy for recurrent depression: Secondary analysis of a randomized trial. *Behavior Therapy*, *44*(1), 162–172. <https://doi.org/10.1016/j.beth.2012.09.004>
- Weisz, J. R., Ng, M. Y., & Bearman, S. K. (2014). Odd couple? Reenvisioning the relation

- between science and practice in the dissemination-implementation era. *Clinical Psychological Science*, 2(1), 58–74. <https://doi.org/10.1177/2167702613501307>
- Weisz, J. R., Ugueto, A. M., Herren, J., Afienko, S. R., & Rutt, C. (2011). Kernels vs. ears, and other questions for a science of treatment dissemination. *Clinical Psychology: Science and Practice*, 18(1), 41–46. <https://doi.org/10.1111/j.1468-2850.2010.01233.x>
- Westra, H. A., & Dozois, D. J. A. (2006). Preparing clients for cognitive behavioral therapy: A randomized pilot study of motivational interviewing for anxiety. *Cognitive Therapy and Research*, 30(4), 481–498. <https://doi.org/10.1007/s10608-006-9016-y>
- Westra, H. A., Dozois, D. J. A., & Marcus, M. (2007). Expectancy, homework compliance, and initial change in cognitive-behavioral therapy for anxiety. *Journal of Consulting and Clinical Psychology*, 75(3), 363–373. <https://doi.org/10.1037/0022-006X.75.3.363>
- Wickham, H. (2009). *ggplot2: Elegant graphics for data analysis*. New York, NY: Springer.
Retrieved from <http://ggplot2.org>

Table 1

Number of homework items assigned and number of homework items completed on all SAFF forms, organized by congruence level

Congruence Level	Homework Completed				Homework Assigned		
	<i>N</i>	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range
Low	160	0.56	1.07	0-6	2.71	1.27	1-6
Medium	287	1.59	1.39	0-5	3.15	1.02	1-6
High	94	1.85	1.54	0-6	2.78	1.25	1-6
Overall	541	1.30	1.41	0-6	2.89	1.23	1-6

“Homework Completed” refers to the number of the assigned homework items that the participant completed at least once throughout the week. “Homework Assigned” refers to the number of total homework items that were assigned that week.

Figure 1

Instructions: Complete this form and bring it to your next therapy session.

I.	Assignments	Mon	Tue	Wed	Thu	Fri	Sat	Sun

Figure 1. Section I of the SAFF. Patients record their assigned homework items and indicate completion on Section I of the SAFF. The presence of one or more checkmarks indicates that the patient completed that homework item.

Complete immediately after session

II. What are 1-2 things you want to remember from session?

Figure 2

Figure 2. Section II of the SAFF. Patients record their takeaways from the session on the lines in Section II, which is located directly underneath Section I.

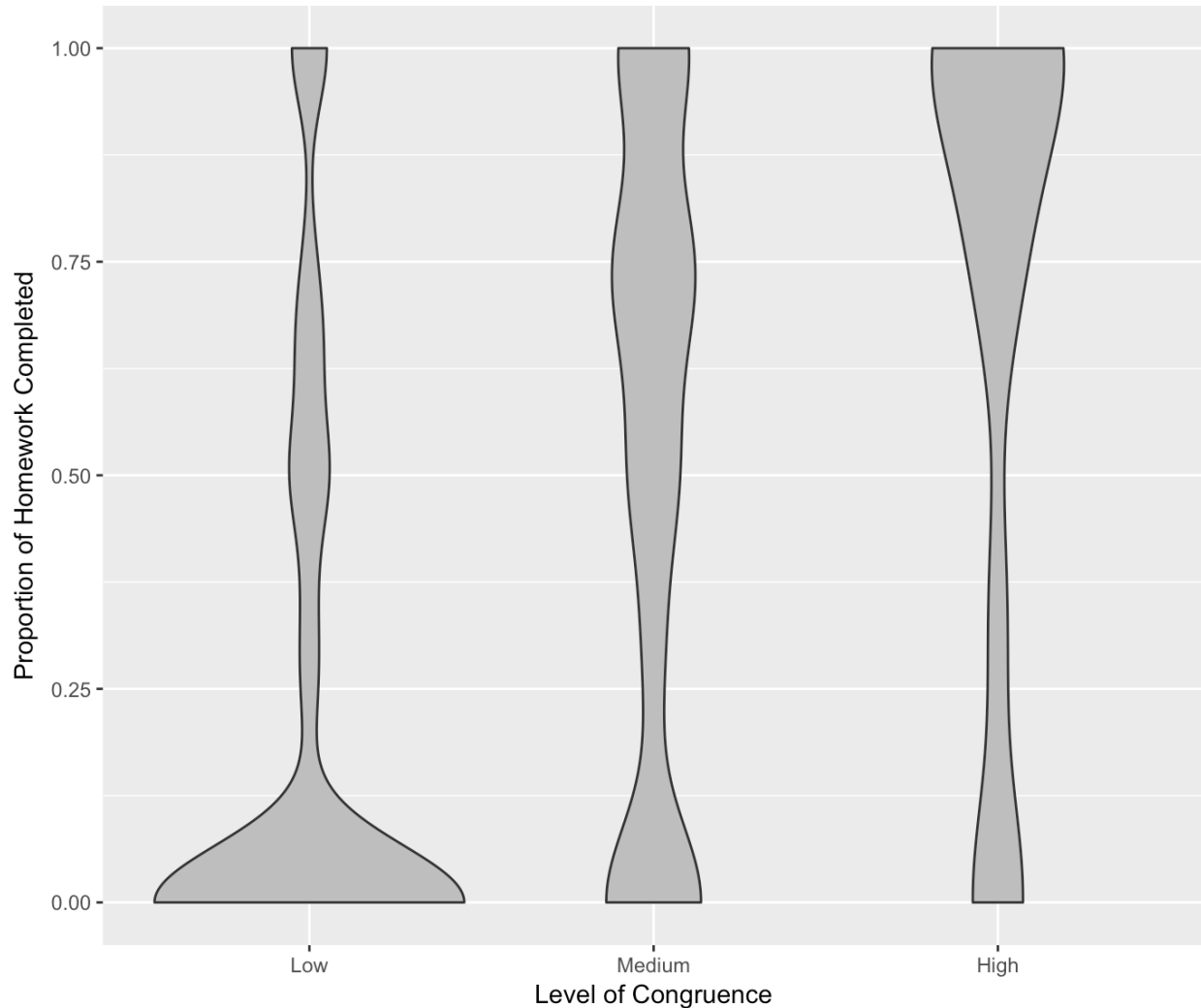


Figure 3

Figure 3. Homework completion rates associated with low, medium, and high congruence levels.

Congruence was determined by the proportion of homework assignments that were congruent with patient takeaways: *Low* (0% - 25% of homework assignments congruent), *Medium* (26% - 74% of homework assignments congruent), or *High* (75% - 100% of homework assignments congruent). Proportion of homework completed is the number of completed homework assignments divided by the number of assigned items as indicated on each SAFF (see Table 1).

Journal Pre-proof

Highlights

- Congruence of homework content and patient takeaways predicted homework compliance
- Therapists may improve compliance by assigning HW congruent with patient takeaways

Journal Pre-proof

Instructions: Complete this form and bring it to your next therapy session.

I.

Assignments	Mon	Tue	Wed	Thu	Fri	Sat	Sun

Figure 1

Complete immediately after session

II. What are 1-2 things you want to remember from session?

Figure 2

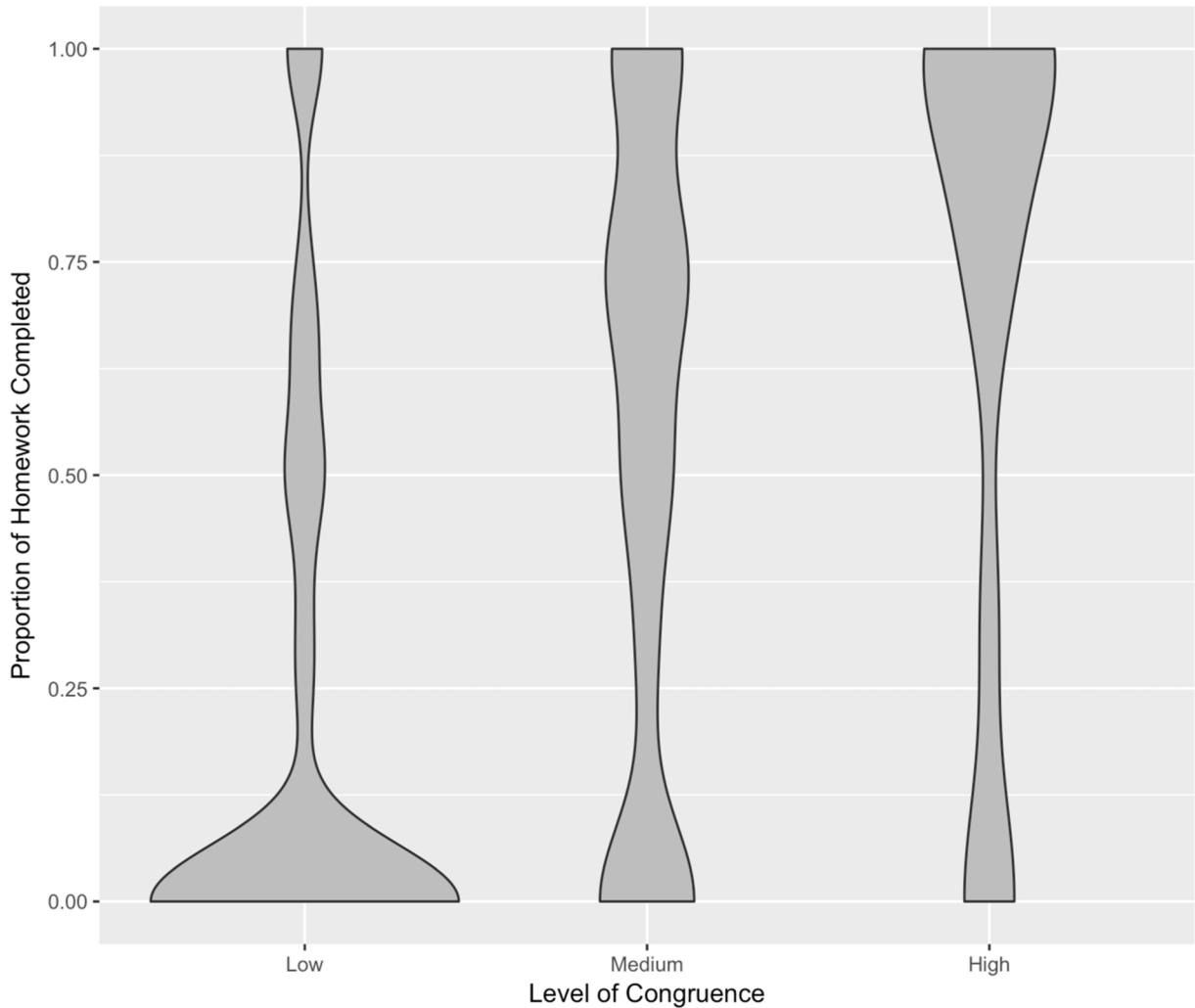


Figure 3