Repetitive negative thinking longitudinally predicts the psychological adjustment of clinical psychology trainees

Iduar Dereix-Calonge[1]

Francisco J. Ruiz[1]

Verónica Cardona-Betancourt[2]

Cindy L. Flórez[1]

[1]Fundación Universitaria Konrad Lorenz

[2]Universitat Oberta de Catalunya

Correspondence address: Francisco J. Ruiz, franciscoj.ruizj@konradlorenz.edu.co,

Fundación Universitaria Konrad Lorenz, Carrera 9 bis, Nº 62-43, Bogotá (Cundinamarca, Colombia), Phone: (+57 1) 347 23 11 ext. 185

Abstract

Clinical psychology trainees often experience emotional difficulties during their clinical training. This study aims to examine the predictive ability of repetitive negative thinking (RNT) for emotional symptoms of clinical psychology trainees. A longitudinal study with 236 clinical psychology trainees was conducted. Before beginning clinical practice (T1), participants responded to measures of emotional symptoms, experiential avoidance, general RNT, and RNT focused on the clinical practice. After two months, participants responded to the measures of emotional symptoms. Bayesian regression analyses showed that the measures of emotional symptoms and RNT focused on the clinical practice at T1 predicted emotional symptoms at T2, whereas general experiential avoidance and RNT did not enter the regression models. These results show that RNT focused on the clinical practice longitudinally predicts emotional symptoms of trainees. Interventions aimed at reducing RNT focused on clinical practice might be efficacious to prevent the increase of emotional symptoms in trainees and to enhance learning during the training.

Resumen

Los practicantes de psicología clínica suelen mostrar dificultades emocionales durante su entrenamiento clínico. Este estudio tiene como objetivo analizar la capacidad predictiva del pensamiento negativo repetitivo (PNR) sobre los síntomas emocionales de los practicantes de psicología clínica. Se llevó a cabo un estudio longitudinal con 236 practicantes. Antes de comenzar la práctica clínica (T1), los practicantes respondieron a medidas de síntomas emocionales, evitación experiencial, PNR general y PNR centrado en la práctica clínica. Tras dos meses, los participantes respondieron de nuevo a medidas de síntomas emocionales. Los análisis de regresión Bayesianos mostraron que las medidas de síntomas emocionales y PNR centrado en la práctica clínica en el T1 predijeron los síntomas emocionales en el T2, mientras que la evitación experiencial y PNR no entraron en los modelos de regresión. Estos resultados muestran que el PNR centrado en la práctica clínica predice longitudinalmente los síntomas emocionales de los practicantes. Las intervenciones con el objetivo de reducir PNR centrado en la práctica clínica podrían ser eficaces en la prevención del incremento de síntomas emocionales de los practicantes y mejorar el aprendizaje durante el entrenamiento.

Palabras clave: Pensamiento negativo repetitivo; Síntomas emocionales; Practicantes de psicología clínica; Factor Bayes; Estudio longitudinal; Evitación experiencial.

Introduction

Mental health professionals usually experience a stressful condition related to caring of individuals suffering from emotional difficulties, which can lead to increases in depression, emotional exhaustion, and anxiety (e.g., Radeke & Mahoney, 2000; Tyssen, Vaglum, Gronvold, & Ekeberg, 2001). Indeed, the systematic review by Simionato and Simpson (2018) found that over half of sampled psychotherapists showed moderate to high levels of burnout. Particularly, trainees in clinical psychology are more exposed to this stressful condition (Cartwright & Gardner, 2016; Simionato & Simpson, 2018; Skovholt & Rønnestad, 2003) and, in fact, research shows that trainees usually show higher levels of emotional symptoms than the rest of the staff (Shapiro, Brown, & Biegel, 2007; Vredenburgh, Carlozzi, & Stein, 1999) and students of other courses (Ruiz, Dereix-Calonge, & Sierra, submitted).

Training in clinical psychology requires some years of intensive theoretical and practical work with the guidance of a clinical supervisor. Clinical psychology trainees usually face a wide range of stressors during their training such as dealing with patients' suffering, the need to establish therapeutic alliances, attending to clients with severe suicidal ideation, having different opinions from their supervisors, insufficient contextual and personal resources, perceiving discrepancies between their initial expectations and the reality of clinical practice, and thoughts related to incompetence when obtaining unsatisfactory outcomes (e.g., Cartwright & Gardner, 2016; Chemtob, Hamada, Bauer, Torigoe, & Kinney, 1988; Cushway, 1992; Cushway & Tyler, 1996; Hill, Sullivan, Knox, & Schlosser, 2007; Kuyken, Peters, Power, Lavender, & Rabe-Hesketh, 2000; Pica, 1998; Skovholt & Rønnestad, 2003; Szymanska, 2002; Truell, 2001).

In spite of the above-mentioned stressors, empirical evidence shows that not all trainees develop emotional difficulties during their training (Cushway, 1992; Myers et al., 2012). In this sense, the way trainees react in response to the above-mentioned stressors seems to be more important to their adjustment than the presence of protective factors such as resources and social support (Galvin & Smith, 2015). Regarding the coping strategies, related research has shown the predicting role of experiential avoidance in depression and burnout among medical students (Kroska, Calarge, O'Hara, Deumic, & Dindo, 2017) and among addiction counselors (Vilardaga et al., 2011).

Experiential avoidance (EA) is a functional class of behaviors directed to either avoid or escape from discomfiting private experiences even at the cost of behaving against one's own values and goals (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Luciano & Hayes, 2001). As a functional class, EA behaviors can take on multiple topographies such as thought suppression, distraction, substance consumption, isolating oneself from people, or worrying and ruminating. When rigidly and generalized among contexts, EA usually expands unwanted private experiences in the long term and further prevents the person from moving toward valued directions (Wilson & Luciano, 2002).

One form of experiential avoidance that is being increasingly studied is repetitive negative thinking (RNT; Ehring & Watkins, 2008; Watkins, 2008), which comprises thinking processes such as worry and rumination. Both types of RNT are problem-solving strategies triggered by thoughts concerning the nonattainment of personal goals and values (Kaplan et al., 2018; Watkins, 2016), which seek to anticipate solutions for future events or finding explanations of what occurs. Although RNT can have adaptive functions, it usually leads to negative consequences when characterized by reduced concreteness and the purpose of avoiding the aversive functions of the triggers (e.g., Newman & Llera, 2011; Roemer & Orsillo, 2002). Importantly, prolonged events of RNT usually lead to increasing negative affect because the thinking process is focused on negative content (Ruiz, Riaño-Hernández, Suárez-Falcón, & Luciano, 2016; Wells, 2009).

Recently, Ruiz, Riaño-Hernández, et al. (2016) have suggested that RNT is an especially counterproductive experiential avoidance strategy because: (a) it is usually the first reaction to aversive private experiences, (b) it tends to prolong negative affect, (c) which usually leads to engagement in additional experiential avoidance strategies to reduce the extended discomfort, and (d) the repetition of this cycle generates an inflexible repertoire that precludes valued living, increases suffering, and reduces behavioral effectiveness.

Clinical psychology trainees are prone to engage in experiential avoidance strategies in an attempt to reduce the discomfort produced by the stressor typical of their duties (e.g., Cartwright & Gardner, 2016; Hill et al., 2007). Among the different experiential avoidance strategies, RNT is probably the first way of responding to the stressors (Dereix-Calonge, Ruiz, Suárez-Falcón, & Flórez, in press). For instance, when the trainee faces a difficult

client, she or he might think "I am not good enough for this client." In response to this negative thought, the trainee might engage in RNT by thinking "Why do I have to attend such difficult clients?" "I will not be able to deal with difficult clients," or "I was not meant to be a clinician." This engagement in RNT would probably lead to increased discomfort, which might provoke the trainee to engage in other experiential avoidance strategies.

If the latter idea is correct, RNT focused on the clinical practice should longitudinally predict the increase of emotional symptoms usually observed in clinical psychology trainees. Note that both the general tendencies to engage in RNT and experiential avoidance might also be longitudinal predictors of emotional symptoms. However, we hypothesized that a specific measure of RNT focused on the clinical practice would be a better predictor because: (a) the most stressful events experienced by novices would more likely be related to the clinical training than to other life areas, (b) these events would most probably trigger RNT focused on the clinical practice, (c) the engagement in RNT would lead to using additional experiential avoidance strategies, and (d) the repetition of this cycle initiated by RNT focused on aspects of the clinical practice would produce an increase of emotional symptoms.

This study aimed to analyze the latter predictions by conducting a longitudinal study with novice clinical psychology trainees. Specifically, a large group of trainees responded to questionnaires measuring emotional symptoms, general experiential avoidance, general RNT, and RNT focused on the clinical practice. After two months, the participants responded again to the measure of emotional symptoms. We expected that the measure of RNT focused on the clinical practice would be a significant and better predictor than general RNT and experiential avoidance. We also expected that RNT focused on the clinical practice would be a longitudinal predictor of emotional symptoms even when accounting for the level of symptoms in the first measurement.

Method

Participants

Two-hundred and forty undergraduate clinical psychology trainees of a Colombian university were invited to participate in this study. After explaining the aims of the study, 236 students agreed to participate (98.33% of the trainees approached; mean age = 22.91, $SD = 3.80$, age range = 19 to 40 years; 83.1% were women). All participants were studying

the 9th semester (out of 10) in which they develop their mandatory clinical practice. Unlike other countries (e.g., USA), Colombian laws permit undergraduates in Psychology to receive training in clinical psychology and to attend to clients with the guide of a supervisor. Participants were at the beginning of their clinical practice in the Center of Clinical Psychology of the university. This center offers inexpensive psychological treatment to the community. All therapists are students and they can treat up to 5 patients suffering from mild to moderate psychological disorders (emotional disorders in children and adults and conduct disorders in children) during the semester. The clinical sessions are face-to-face and the trainees conduct them being the only therapist in the room. Trainees are individually supervised by a clinical psychologist once a week for 1.5 h. Additionally, trainees attend 2-hour, group-based, clinical training on a weekly basis.

Almost all participants were single (95.8%). Forty-two percent of the participants had received some kind of psychological or psychiatric treatment in the past, but only 4.7% were receiving treatment when the study was conducted (only 1.7% were taking psychotropic medication). A raffle of five books on Clinical Psychology was conducted at the end of the study to compensate the participants who finished the study.

Instrument

Depression, Anxiety, and Stress Scales – 21 (DASS-21; Lovibond & Lovibond, 1995; Spanish version by Daza, Novy, Stanley, & Averill, 2002). The DASS-21 is a 21-item, 4-point Likert-type scale (3 = *applied to me very much, or most of the time*; 0 = *did not apply to me at all*) consisting of sentences describing negative emotional states. It contains three subscales (Depression, Anxiety, and Stress) and has shown good internal consistency and convergent and discriminant validity. The DASS-21 has shown good psychometric properties in Colombia (Ruiz, García-Martín, Suárez-Falcón, & Odriozola-González, 2017), with Cronbach's alphas of .93 (DASS-Total), .88 (Depression), .83 (Anxiety), and .83 (Stress).

General Health Questionnaire – 12 (Goldberg & Williams, 1988; Spanish version by Rocha, Pérez, Rodríguez-Sanz, Borrell, & Obiols, 2011). The GHQ-12 is a 12-item, 4-point Likert-type scale that is frequently used as screening for psychological disorders. Respondents are asked to indicate the degree to which they have recently experienced a range of common symptoms of distress, with higher scores reflecting greater levels of

psychological distress. The GHQ-12 has shown excellent psychometric properties in Colombia, with a Cronbach's alpha of .90 (Ruiz, García-Beltrán, & Suárez-Falcón, 2017).

Acceptance and Action Questionnaire – II (AAQ-II; Bond et al., 2011; Spanish translation by Ruiz, Langer, Luciano, Cangas, & Beltrán, 2013). The AAQ-II is a 7-item, 7-point Likert-type scale (7 = *always true*; 1 = *never true*) that measures experiential avoidance. The items reflect unwillingness to experience unwanted emotions and thoughts and the inability to be in the present moment and behave according to value-directed actions when experiencing unwanted psychological events. The Spanish version by Ruiz, Suárez-Falcón et al. (2016) showed good psychometric properties (Cronbach's alpha of .91) and a one-factor structure in Colombian samples.

Perseverative Thinking Questionnaire (PTQ; Ehring et al., 2011). The PTQ is a 15-item, 5-point Likert (4 = *almost always*; 0 = *never*), self-report instrument that was designed to evaluate the tendency to engage in RNT when facing negative experiences or problems. Unlike other measures, the PTQ is a content-independent self-report of RNT. The PTQ has shown excellent internal consistency, high test-retest reliability, and convergent and predictive validity. As there is no Spanish translation of the PTQ, we back-translated it following the guidelines of Muñiz, Elosua, and Hambleton (2013). Preliminary data from our laboratory indicate that the PTQ possesses excellent internal consistency in Colombia and a one-factor structure (Cronbach's alpha of .96).

Perseverative Thinking Questionnaire for Clinical Psychology Trainees (PTQ-CPT; Dereix-Calonge et al., in press). The PTQ-CPT is a 9-item, 5-point Likert (4 = *almost always*; 0 = *never*), self-report instrument that was designed to evaluate the tendency of clinical psychology trainees to engage in RNT concerning issues of the clinical practice. It was based on the PTQ and, as such, it is also a content-independent self-report of RNT. Dereix-Calonge et al. showed that the PTQ-CPT possesses an excellent internal consistency (alpha of .93) and a sound one-factor structure.

Procedure

The procedure of this study was approved by the institutional Ethics Committee. Potential participants were invited to participate in the study in a regular class at the beginning of the academic semester just before beginning the mandatory clinical practice. The researchers were independent to the clinical training received by the trainees. Students

were told that the aim of the study was to analyze what psychological variables were associated with the psychological adjustment of clinical psychology trainees. Students who agreed to participate in the study signed an informed consent. Subsequently, they were given a questionnaire package including a sociodemographic form and the questionnaires listed above in the following order: DASS-21, GHQ-12, AAQ-II, PTQ, and PTQ-CPT. This served as Time 1 assessment (T1). Time 2 assessment (T2) was conducted after approximately 2 months, in a week free of exams to avoid evaluating in academically stressful days. In this case, because it was not possible to access a regular class for a second time, participants were contacted through email and were invited to respond to the DASS-21 and GHQ-12 through the website www.typeform.com. The link with the survey was only active for one week.

Data analysis

Bayesian data analyses were conducted in this study. One of the distinctive features of Bayesian statistics is that they include prior expectations of the parameters. These prior expectations are expressed by prior distributions that receive high density at plausible parameter values and low density at implausible parameter values (Lee, 2004). Prior distributions can be determined based on previous research, expert knowledge, scale boundaries, and statistical considerations (Wagenmakers et al., 2018).

All data analyses were conducted with the free software R or JASP 0.9.0.1 (https://jasp-stats.org/). The JASP software provides a graphical interface of the BayesFactor and BAS packages. The BayesFactor package permits the computation of Bayes factors in standard statistical analyses (e.g., t-tests, ANOVA, correlations, regression, etc.). Bayes factor (BF) quantifies the relative evidence in the data, expressed as relative odds, for the null or the alternative hypotheses. The BF can also be seen as the extent to which a rational person should adjust his or her beliefs in favor of the most supported hypothesis according to the data, where a $BF > 1$ means that the data support the alternative hypothesis, and a $BF < 1$ indicates that the data support the null hypothesis. Bayes factors can be interpreted according to the guidelines provided by Jeffreys (1961) and Wagenmakers, Wetzels, Borsboom, and van der Maas (2011): 1 = No evidence for the alternative hypothesis; 1-3 = Anecdotal evidence for the alternative hypothesis; 3-10 = Substantial evidence for the alternative hypothesis; 10-30 = Strong evidence for the

alternative hypothesis; 30-100 = Very strong evidence for the alternative hypothesis; and >100 = Extreme evidence for the alternative hypothesis (note that BFs < 1 are interpreted in the same way, but favoring the null hypothesis).

The BAS package was used to conduct Bayesian, linear, multiple regression analyses. This package implements Bayesian Model Averaging and Model Selection and allows the use of multiple, state of art, prior distributions. For this purpose, the package uses a Bayesian Adaptive Sampling (BAS) algorithm of sample models without replacement using the initial sampling probabilities (Clyde, Ghosh, & Littman, 2011).

Firstly, we explored whether there were differences between participants who responded to the survey at T2 and those who did not. For continuous variables, we computed JZS Bayesian independent t-tests (Rouder, Speckman, Sun, Morey, & Iverson, 2009). The JZS independent t-test suggests Cauchy prior distributions in which the effect size of the factor, termed δ, is located at 0, and the researcher can modify the parameter r that represents the width of the distribution (higher values of r places more density at higher effect sizes). The default value of r was used ($r = 0.707$). For nominal variables, we computed Bayesian multinomial tests (Gunel & Dickey, 1974) with a default prior concentration of 1.

Secondly, we computed the descriptive data for each variable and coefficient alpha. Thirdly, Pearson correlations among the scores on the instruments at both T1 and T2 were computed with the default prior to compute the Bayes factors (stretched beta prior width of 1). Lastly, five multiple regression analyses were conducted with the BAS package. The predicting variables were the total score of the DASS-21 and GHQ-12 scales and the scores of the subscales Depression, Anxiety, and Stress of the DASS-21 at T2. In each regression analysis, the scores of the AAQ-II, PTQ, and PTQ-CPT at T1 were entered as predictor variables. Additionally, the scores of the predicting variables at T1 were also entered in each regression model (e.g., the total DASS-21 scores at T1 were introduced as predictor variables in the regression model of the total DASS-21 scores at T2). The hyper-g prior distribution for regression coefficients was adopted (Liang, Paulo, Molina, Clyde, & Berger, 2008). This prior distribution is a mixture of g-priors (Zellner, 1986) that resolve many of the inconsistencies produced by using a fixed g, while maintaining at the same

time its computational simplicity. The uniform prior distribution was adopted for the estimation of models and the BAS algorithm as the sampling method.

Results

Initial equivalence of participants

Of the 236 participants who responded at T1, 164 responded at T2 (i.e., 69.5% of participants finished the study). Table 1 shows the descriptive data for participants who responded at T2 and participant who did not in continuous variables. All Bayes factors supported the null hypothesis of no differences between completer and noncompleter participants, except for the variable age, in which the *BF* was 1.35. However, this Bayes factor can be interpreted as only anecdotal evidence for the alternative hypothesis of differences in age between completers and noncompleters. Regarding dichotomous variables, Bayes factors were 0.16, 0.85, 0.47, and 2.72 for gender, past psychological/psychiatric treatment, current psychological/psychiatric treatment, and psychotropic medication, respectively. Accordingly, completers and noncompleters did not differ in sociodemographic and the predicting variables of the study.

INSERT TABLE 1 ABOUT HERE

Descriptive data, internal consistencies and Pearson correlations

Table 2 shows that mean scores of participants at T1 were similar to the mean scores found in other studies with Colombian samples (e.g., Dereix-Calonge et al., in press; Ruiz, García-Martín, et al., 2017; Ruiz, García-Beltrán et al., 2017; Ruiz, Suárez-Falcón et al., 2016). Cronbach's alphas both at T1 and T2 were good to excellent and also similar to previous studies in Colombia. Correlations between emotional symptoms at T1 and T2 were modest (DASS-Total: $r = .48$; Depression: $r = .56$; Anxiety: $r = .49$; Stress: $r = .37$; GHQ-12: $r = .46$).

INSERT TABLE 2 ABOUT HERE

Multiple regression analyses

Table 3 shows a summary of the regression coefficients of the five multiple regression analyses conducted. The "mean" column presents the mean value of the distribution of the beta coefficients and the "*SD*" column the standard deviation of these distributions. The "P(incl)" column shows that all variables were given 50% of a priori possibilities of predicting the dependent variables excepting the intercept. The

"P(incl|data)" column indicates the updated probabilities after having observed the data. The "BF inclusion" column presents the change from prior to posterior inclusion odds. Lastly, the columns for the "95% Credible Interval" presents the values of beta for the 2.5% and 97.5% limits. For all regression analyses[1], the scores on the dependent variable and the PTQ-CPT at T1 showed values of $BF_{inclusion}$ higher than 1. This means that, averaged across all candidate models, the data support the inclusion of both factors. The PTQ and AAQ-II showed $BF_{inclusion}$ values lower than 1, which indicates that the data do not support the inclusion of these factors.

<center>INSERT TABLE 3 ABOUT HERE</center>

Table 4 shows the best four models for each regression analysis. The P(M) column indicates that all models were given the same prior probability (i.e., 6.3%). The P(M|data) column shows the updated probabilities after having observed the data for each model. The "BF_M" column shows the degree to which the data have changed the prior model odds and the "BF" column shows the Bayes factors compared to the best model (i.e., the best model was given a value of 1). Lastly, the "R^2" column indicates the percentage of variance explained by each model. In all regression analyses, the best models were the scores of the PTQ-CPT and the dependent variable at T1. The R^2 values were modest, from .247 for predicting the GHQ-12 scores to 0.327 for predicting the DASS-Depression at T2.

<center>INSERT TABLE 4 ABOUT HERE</center>

<center>**Discussion**</center>

The current study aimed to analyze the longitudinally predictive role of general experiential avoidance, general RNT, and RNT focused on the clinical practice in the usual increase of emotional symptoms experienced by clinical psychology trainees during their training. Based on recent analyses of the interaction between RNT and experiential avoidance (e.g., Ruiz, Riaño-Hernández, et al., 2016), we hypothesized that RNT focused on the clinical practice would be the best predictor of emotional symptoms.

The results showed increases of emotional symptoms in the clinical psychology trainees from T1 (i.e., before beginning the clinical practice) to T2 (i.e., middle of the semester). This finding is coherent with the data obtained by Ruiz et al. (submitted) in a very similar sample of trainees and provides further evidence of the emotional difficulties often found by trainees. Emotional symptoms measured at both time points only showed

moderate correlations (from .37 for Stress to .56 for Depression). This contrasts with other similar longitudinal studies in which emotional symptoms have been shown to be more stable across a period of 2 months (e.g., Long & Hayes, 2014). This seems to indicate that contextual factors and previous differences in coping strategies can exert a high effect in the variation of emotional symptoms in clinical psychology trainees across a short period of time. Indeed, scores on RNT focused on the clinical practice at T1 showed higher correlations with the DASS-Total and Stress scores at T2 than the test-retest of these variables.

The results of the five Bayesian multiple-regression models showed similar results. In all cases, the specific symptoms evaluated at T1 entered the best models that predicted those emotional symptoms at T2. Additionally, the scores on RNT focused on the clinical practice (i.e., PTQ-CPT scores) entered the best regression models in all cases. Contrarily, none of the scores on general experiential avoidance or the scores on general RNT entered the best regression models. Specifically, the $BF_{inclusion}$ showed that the change from prior to posterior inclusion odds for the PTQ-CPT was extreme for the DASS-Total and Stress. In both cases, the PTQ-CPT scores were better predictors than the specific symptoms baseline. Additionally, the PTQ-CPT showed very strong evidence in favor of its inclusion for the prediction of Anxiety and substantial evidence for Depression. Lastly, the PTQ-CPT scores only showed anecdotal evidence for its inclusion in the prediction of the GHQ-12 scores at T2.

Overall, the findings of this study were coherent with the hypothesis that RNT focused on the clinical practice would be a better longitudinal predictor of the increase of emotional symptoms observed in novice clinical psychology trainees than general RNT and experiential avoidance. This seems logical to the extent that the most stressful events in the lives of novice clinical psychology trainees would probably be related to the clinical practice, which might lead trainees to engage in RNT focused on the clinical practice. This might be especially true among the trainees who usually respond by engaging in RNT in response to other stressors. However, individuals usually engage in RNT when the situation is related to their own values and goals and they do not perceive themselves as capable to cope with it (Berenbaum, 2010; Gil-Luciano, Calderón-Hurtado, Tovar, Sebastián, & Ruiz, 2019); therefore, individuals prone to engage in RNT might not react this way during their

clinical practice because it is not especially relevant for them or because they perceive themselves as competent clinical psychologists. In conclusion, the findings of the current study highlight the relevance of developing RNT measures tailored to specific contexts, such as the PTQ-CPT, to increase the predictive ability of RNT in such contexts.

Some limitations of the current study are worth mentioning. Firstly, as all data were obtained by means of self-report measures, the relationships among the variables might be artificially inflated. Secondly, the sample of this study consisted of undergraduate clinical psychology trainees. However, in a good number of countries, training in clinical psychology is only permitted at postgraduate level, which might complicate the generalizability of the current findings. Accordingly, further studies might replicate the results presented with clinical psychology trainees at postgraduate level. Thirdly, another limitation of the current study is that the sample was recruited from only one university, which can also hinder the generalizability of the results. Fourthly, only the 69.5% ($N = 164$) of the trainees who responded to the package of questionnaires at T1 responded at T2. However, there was no evidence that completers were different from noncompleters according to the Bayesian t-tests conducted. Fifthly, the assessment methods used at T1 (i.e., paper and pencil) and T2 (responding trough a website) were different, which could affect the way of responding to the questionnaires. However, note that previous research in the use of the DASS-21 and GHQ-12 has shown measurement invariance across both ways of responding (Ruiz, García-Beltrán, et al., 2017; Ruiz, García-Martín, et al., 2017). Sixthly, the current study did not assess the occurrence of relevant stressors different from the clinical practice (e.g., couple separation, illness, etc.). Measuring relevant stressors might increase the percentage of variance explained by the regression models. Accordingly, subsequent longitudinal studies should include a measure of stressors experienced by the trainees. Lastly, longitudinal designs do not allow for attributions of causality because no independent variables are manipulated. Nonetheless, longitudinal studies provide a way to explore the interrelations of key concepts of psychological models that can lead to refinement of theories and interventions.

The current study has shown that RNT focused on the clinical practice predicts the increase of emotional symptoms of clinical psychology trainees during the beginning of the clinical practice above and beyond the baseline levels of emotional symptoms. This

indicates that RNT focused on the clinical practice might be a relevant target for psychological interventions aiming to reduce or prevent the emotional difficulties usually observed in clinical psychology trainees. Accordingly, psychological interventions specifically targeting RNT, such as metacognitive therapy (Wells, 2009), rumination-focused cognitive-behavioral therapy (Watkins, 2016) or RNT-focused acceptance and commitment therapy (Ruiz et al., 2018; Ruiz, Riaño-Hernández et al., 2016) might be adapted to address RNT focused on the clinical practice and tested to promote mental health of clinical psychology trainees.

References

Berenbaum, H. (2010). An initiation–termination two-phase model of worrying. *Clinical Psychology Review, 30*, 962-975.

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., . . . Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire – II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy, 42*, 676-688.

Chemtob, C. M., Hamada, R. S., Bauer, G., Torigoe, R. Y., & Kinney, B. (1988). Patient suicide: Frequency and impact on psychologists. *Professional Psychology: Research and Practice, 19*, 416-420.

Cartwright, D., & Gardner, M. (2016). Trainee difficulties with therapeutic engagement: A qualitative study of in-session critical incidents. *South African Journal of Psychology, 46*, 254-265.

Clyde, M. A., Ghosh, J., & Littman, M. L. (2011). Bayesian adaptive sampling for variable selection and model averaging. *Journal of Computational and Graphical Statistics, 20*, 80-101.

Cushway, D. (1992). Stress in clinical psychology trainees. *British Journal of Clinical Psychology*, *31*, 169-179.

Cushway, D., & Tyler, P. (1996). Stress in clinical psychologists. *International Journal of Social Psychology, 42*, 141-149.

Daza, P., Novy, D. M., Stanley, M., & Averill, P. (2002). The Depression Anxiety Stress Scale-21: Spanish translation and validation with a Hispanic sample. *Journal of Psychopathology and Behavioral Assessment, 24*, 195-205.

Dereix-Calonge, I., Ruiz, F. J., Suárez-Falcón, J. C., & Flórez, C. L. (in press). Adapting the Perseverative Thinking Questionnaire for measuring repetitive negative thinking in clinical psychology trainees. *Training and Education in Professional Psychology*.

Ehring, T., & Watkins, E. R. (2008). Repetitive negative thinking as a transdiagnostic process. *International Journal of Cognitive Therapy*, *1*, 192-205.

Ehring, T., Zetsche, U., Weidacker, K., Wahl, K., Schönfelds, S., & Ehlers, A. (2011). The Perseverative Thinking Questionnaire (PTQ): Validation of a content-independent

measure of repetitive negative thinking. *Journal of Behavior Therapy and Experimental Psychiatry 42,* 225-232.

Galvin, J., & Smith, A. P. (2015). Stress in UK mental health training: A multi-dimensional comparison study. *British Journal of Education, Society & Behavioural Science*, *9*, 161-175.

Gil-Luciano, B., Calderón-Hurtado, T., Tovar, D., Sebastián, B., & Ruiz, F. J. (2019). How are triggers for repetitive negative thinking organized? A relational frame analysis. *Psicothema, 31*, 53-59.

Goldberg, D., & Williams, P. (1988). *A user's guide to the General Health Questionnaire*. NFER-Nelson: Windsor, UK.

Gunel, E., & Dickey, J. (1974). Bayes factors for independence in contingency tables. *Biometrika, 61*, 545-557.

Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. D. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, *64*, 1152-1168.

Hill, C. E., Sullivan, C., Knox, S., & Schlosser, L. Z. (2007). Becoming psychotherapists: Experiences of novice trainees in a beginning graduate class. *Psychotherapy: Theory, Research, Practice, Training*, *44,* 434-449

Jeffreys, H. (1961). *Theory of probability*. Oxford, UK: Oxford University Press.

Kaplan, D. M., Palitsky, R., Carey, A. L., Crane, T. E., Havens, C. M., Medrano, M. R., ... O'Connor, M. F. (2018). Maladaptive repetitive thought as a transdiagnostic phenomenon and treatment target: An integrative review. *Journal of Clinical Psychology, 74*, 1126-1136.

Kroska, E. B., Calarge, C., O'Hara, M. W., Deumic, E., & Dindo, L. (2017). Burnout and depression in medical students: Relations with avoidance and disengagement. *Journal of Contextual Behavioral Science, 6*, 404-408.

Kuyken, W., Peters, E., Power, M., Lavender, T., & Rabe-Hesketh, S. (2000). A longitudinal study of the psychological adaptation of trainee clinical psychologists. *Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice*, *7,* 394-400.

Lee, P. M. (2004). *Bayesian statistics: An introduction* (3rd ed.). New York, NY: Wiley.

Liang, F., Paulo, R., Molina, G., Clyde, M., & Berger, J. (2008). Mixtures of g-priors for Bayesian variable selection. *Journal of the American Statistical Association, 103*, 410-423.

Long, D. M., & Hayes, S. C. (2014). Acceptance, mindfulness, and cognitive reappraisal as longitudinal predictors of depression and quality of life in educators. *Journal of Contextual Behavioral Science, 3*, 38-44.

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*, 335-343.

Luciano, C., & Hayes, S. C. (2001). Trastorno de evitación experiencial [Experiential avoidance disorder]. *International Journal of Clinical and Health Psychology, 1*, 109-157.

Muñiz, J., Elosua, P., & Hambleton, R. K. (2013). International Test Commission guidelines for test translation and adaptation. *Psicothema, 25*, 151-157.

Myers, S. B., Sweeney, A. C., Popick, V., Wesley, K., Bordfeld, A., & Fingerhut, R. (2012). Self-care practices and perceived stress levels among psychology graduate students. *Training and Education in Professional Psychology*, *6*, 55-66.

Newman, M. G., & Llera, S. J. (2011). A novel theory of experiential avoidance in generalized anxiety disorder: A review and synthesis of research supporting a contrast avoidance model of worry. *Clinical Psychology Review*, *31*, 371-382.

Pica, M. (1998). The ambiguous nature of clinical training and its impact on the development of student clinicians. *Psychotherapy: Theory, Research, Practice, Training*, *35*, 361-365.

Radeke, J. T., & Mahoney, M. J. (2000). Comparing the personal lives of psychotherapists and research psychologists. *Professional Psychology: Research and Practice, 31,* 82-84.

Rocha, K., Pérez, K., Rodríguez-Sanz, M., Borrell, C., & Obiols, J. E. (2011). Propiedades psicométricas y valores normativos del General Health Questionnaire (GHQ-12) en población española [Psychometric properties and normative scores of the General

Health Questionnaire (GHQ-12) in general Spanish population]. *International Journal of Clinical and Health Psychology, 11*, 125-139.

Roemer, L., & Orsillo, S. M. (2002). Expanding our conceptualization of and treatment for generalized anxiety disorder: Integrating mindfulness/acceptance-based approaches with existing cognitive-behavioral models. *Clinical Psychology: Science and Practice*, *9*, 54-68.

Rouder, J. N., Speckman, P. L., Sun, D., Morey, R. D., & Iverson, G. (2009). Bayesian t-tests for accepting and rejecting the null hypothesis. *Psychonomic Bulletin & Review*, *16*, 225-237.

Ruiz, F. J., Flórez, C. L., García-Martín, M. B., Monroy-Cifuentes, A., Barreto-Montero, K., García-Beltrán, D. M., ...Gil-Luciano, B. (2018). A multiple-baseline evaluation of a brief acceptance and commitment therapy protocol focused on repetitive negative thinking for moderate emotional disorders. *Journal of Contextual Behavioral Science, 9*, 1-14.

Ruiz, F. J., García-Beltrán, D. M., & Suárez-Falcón, J. C. (2017). General Health Questionnaire-12 validity in Colombia and factorial equivalence between clinical and nonclinical participants. *Psychiatry Research, 256*, 53-58.

Ruiz, F. J., García-Martín, M. B., Suárez-Falcón, J. C., & Odriozola-González, P. (2017). The hierarchical factor structure of the Spanish version of Depression Anxiety and Stress Scale-21. *International Journal of Psychology and Psychological Therapy, 17*, 97-105.

Ruiz, F. J., Langer, A. I., Luciano, C., Cangas, A. J., & Beltrán, I. (2013). Measuring experiential avoidance and psychological inflexibility: The Spanish translation of the Acceptance and Action Questionnaire. *Psicothema*, *25,* 123-129.

Ruiz, F. J., Riaño-Hernández, D., Suárez-Falcón, J. C., & Luciano, C. (2016). Effect of a one-session ACT protocol in disrupting repetitive negative thinking: A randomized multiple-baseline design. *International Journal of Psychology and Psychological Therapy, 16*, 213-233.

Ruiz, F. J., Suárez-Falcón, J. C., Cárdenas-Sierra, S., Durán, Y. A., Guerrero, K., & Riaño-Hernández, D. (2016). Psychometric properties of the Acceptance and Action Questionnaire – II in Colombia. *The Psychological Record, 66*, 429-437.

Shapiro, S. L., Brown, K. W., & Biegel, G. M. (2007). Teaching self-care to caregivers: Effects of mindfulness-based stress reduction on the mental health of therapists in training. *Training and Education in Professional Psychology*, *1*, 105-115.

Simionato, G. K., & Simpson, S. (2018). Personal risk factors associated with burnout among psychotherapists: A systematic review of the literature. *Journal of Clinical Psychology, 74*, 1431-1456.

Skovholt, T. M., & Rønnestad, M. H. (2003). Struggles of the novice counselor and therapist. *Journal of Career Development*, *30*, 45-58.

Szymanska, K. (2002). Trainee expectations in counselling psychology as compared to the reality of training experiences. *Counselling Psychology Review, 17*, 22–27.

Truell, R. (2001). The stresses of learning counselling: Six recent graduates comment on their personal experience of learning counselling and what can be done to reduce associated harm. *Counselling Psychology Quarterly, 14*, 67-89.

Tyssen, R., Vaglum, P., Gronvold, N. T., & Ekeberg, O. (2001). Factors in medical school that predict postgraduate mental health problems in need of treatment. A nationwide and longitudinal study. *Medical Education, 35*, 110-120.

Vilardaga, R., Luoma, J. B., Hayes, S. C., Pistorello, J., Levin, M. E., Hildebrandt, M. J., ...Bond, F. W. (2011). Burnout among the addiction counseling workforce: The differential roles of mindfulness and values-based processes and work-site factors. *Journal of Substance Abuse Treatment*, *40*, 323-335.

Vredenburgh, L. D., Carlozzi, A. F., & Stein, L. B. (1999). Burnout in counselling psychologists: Type of practice setting and pertinent demographics. *Counselling Psychology Quarterly, 12*, 293-302.

Wagenmakers, E.-J., Love, J., Marsman, M., Jamil, T., Ly, A., Verhagen, J., …Morey, R. D. (2018). Bayesian statistical inference for psychological science. Part II: Example applications with JASP. *Psychonomic Bulletin & Review, 25*, 58-76.

Wagenmakers, E. J., Wetzels, R., Borsboom, D., & van der Maas, H. L. J. (2011). Why psychologists must change the way they analyze their data: The case of Psi: Comment on Bem (2011). *Journal of Personality and Social Psychology, 3*, 426-432.

Watkins, E. R. (2008). Constructive and unconstructive repetitive thought. *Psychological Bulletin*, *134*, 163-206.

Watkins, E. R. (2016). *Rumination-focused cognitive-behavioral therapy for depression*. New York, NY: Guilford Press.

Wells, A. (2009). *Metacognitive therapy for anxiety and depression*. New York, NY: Guilford Press.

Wilson, K. G., & Luciano, C. (2002). *Terapia de Aceptación y Compromiso. Un tratamiento conductual orientado a los valores* [Acceptance and Commitment Therapy. A values-oriented behavioral treatment]. Madrid: Pirámide.

Zellner, A. (1986). On assessing prior distributions and Bayesian regression analysis with *g*-prior distributions. In P. Goel & A. Zellner (Eds.) *Bayesian inference and decision techniques* (pp. 233-243). Amsterdam: Elsevier Science.

[1]Following a reviewer's suggestion, we reran the Bayesian multiple regression analyses by including the following predictor variables: gender, age, past psychological/psychiatric treatment, and actual psychological/psychiatric treatment. The results were basically the same: the best models included the scores of dependent variables and the PTQ-CPT at T1. The variable past psychological/psychiatric treatment was included in the best models as the third better predictor of the DASS-Total ($BF_{inclusion} = 2.72$), DASS-Depression ($BF_{inclusion} = 2.37$), and DASS-Stress ($BF_{inclusion} = 1.22$): participants who received psychological/psychiatric treatment in the past showed a tendency towards increasing their emotional symptoms more than participants who did not receive psychological/psychiatric treatment. The remaining new variables did not show to be good predictors of emotional symptoms at T2.

Table 1

Descriptive Data and Bayes Factors of Participants who Responded at T2 and those who did not Respond at T1

	Completers *M* (*SD*)	Noncompleters *M* (*SD*)	*BF*
Age	22.55 (3.40)	23.71 (4.53)	1.35
DASS-Total	15.22 (9.93)	16.72 (12.97)	0.24
DASS-Depression	3.38 (3.85)	4.19 (4.65)	0.38
DASS-Anxiety	4.53 (3.71)	5.21 (4.64)	0.30
DASS-Stress	7.51 (4.88)	7.51 (4.88)	0.16
GHQ-Total	11.01 (5.85)	11.94 (6.10)	0.28
AAQ-II	21.60 (8.88)	21.57 (10.18)	0.15
PTQ	21.04 (12.66)	21.51 (13.84)	0.16
PTQ-CPT	14.29 (8.16)	15.07 (8.36)	0.19

Note. AAQ-II = Acceptance and Action Questionnaire – II; DASS = Depression, Anxiety, and Stress Scale – 21; GHQ = General Health Questionnaire – 12; PTQ = Perseverative Thinking Questionnaire; PTQ-CPT = Perseverative Thinking Questionnaire – Clinical Psychology Trainees.

Table 2

Descriptive Data, Internal Consistencies, and Correlations at T1 and T2

	1	2	3	4	5	6	7	8	9	10	11	12	13	*M*	*SD*	*α*
1. DASS-Total (T1)														15.7	10.9	.92
2. Depression (T1)	.85**													3.6	4.1	.87
3. Anxiety (T1)	.85**	.55**												4.7	4.0	.78
4. Stress (T1)	.91**	.67**	.69**											7.5	4.4	.83
5. GHQ-12 (T1)	.75**	.74**	.54**	.66**										11.3	5.9	.87
6. AAQ-II (T1)	.64**	.64**	.47**	.56**	.69**									21.6	9.3	.91
7. PTQ (T1)	.58**	.47**	.52**	.50**	.61**	.72**								21.2	13.0	.96
8. PTQ-CPT (T1)	.56**	.38**	.53**	.54**	.56**	.51**	.52**							14.5	8.2	.93
9. DASS-Total (T2)	**.48**	.48**	.39**	.35**	.46**	.37**	.42**	.51**						20.5	11.5	.92
10. Depression (T2)	.41**	**.56**	.23	.27*	.47**	.37**	.40**	.38**	.87**					5.6	4.9	.90
11. Anxiety (T2)	.43**	.32**	**.49**	.28*	.30**	.25	.35**	.46**	.84**	.56**				4.9	4.1	.82
12. Stress (T2)	.40**	.34**	.30**	**.37**	.40**	.33**	.34**	.49**	.89**	.67**	.65**			10.0	4.3	.83
13. GHQ-12 (T2)	.39**	.48**	.18	.31**	**.46**	.33**	.33**	.37**	77**	.79**	.53**	.66**		13.6	6.9	.87

Note. ****BF* > 100, *BF > 30; AAQ-II = Acceptance and Action Questionnaire – II; DASS-21 = Depression, Anxiety, and Stress Scale – 21; GHQ-12 = General Health Questionnaire – 12; PTQ = Perseverative Thinking Questionnaire; PTQ-CPT = Perseverative Thinking Questionnaire for Clinical Psychology Trainees

Table 3

Posterior Summaries of Regression Coefficients. Predictor Variables contained in the Best Model are in Bold

Coefficient	Mean	SD	P(incl)	P(incl|data)	BF inclusion	95% Credible Interval Lower	Upper
				DASS-Total			
Intercept	20.361	0.781	1.000	1.000	1.000	18.874	22.037
DASS-Total	**0.262**	**0.124**	**0.500**	**0.916**	**10.854**	**0.000**	**0.451**
AAQ-II	0.005	0.061	0.500	0.198	0.247	-0.097	0.215
PTQ	0.052	0.081	0.500	0.410	0.696	-0.020	0.247
PTQ-CPT	**0.458**	**0.125**	**0.500**	**0.996**	**236.896**	**0.219**	**0.715**
				DASS-Depression			
Intercept	5.567	0.319	1.000	1.000	1.000	4.867	6.132
DASS-Dep	**0.551**	**0.096**	**0.500**	**1.000**	**431664.465**	**0.355**	**0.730**
AAQ-II	-0.003	0.026	0.500	0.187	0.230	-0.063	0.044
PTQ	0.021	0.034	0.500	0.402	0.671	-0.002	0.104
PTQ-CPT	**0.084**	**0.060**	**0.500**	**0.771**	**3.369**	**0.000**	**0.180**
				DASS-Anxiety			
Intercept	4.880	0.279	1.000	1.000	1.000	4.357	5.427
DASS-Anx	**0.360**	**0.089**	**0.500**	**0.998**	**624.234**	**0.177**	**0.524**
AAQ-II	-0.007	0.025	0.500	0.224	0.289	-0.089	0.014
PTQ	0.009	0.022	0.500	0.279	0.386	-0.011	0.071
PTQ-CPT	**0.131**	**0.044**	**0.500**	**0.978**	**43.798**	**0.049**	**0.219**
				DASS-Stress			
Intercept	10.000	0.305	1.000	1.000	1.000	9.401	10.579
DASS-Stress	**0.096**	**0.101**	**0.500**	**0.591**	**1.447**	**-0.004**	**0.274**
AAQ-II	0.011	0.029	0.500	0.270	0.370	-0.012	0.104
PTQ	0.008	0.020	0.500	0.264	0.359	-0.017	0.063
PTQ-CPT	**0.217**	**0.047**	**0.500**	**1.000**	**7338.009**	**0.121**	**0.306**
				GHQ-12			
Intercept	13.061	0.487	1.000	1.000	1.000	12.654	14.573
GHQ-12	**0.468**	**0.108**	**0.500**	**0.999**	**1413.996**	**0.232**	**0.663**
AAQ-II	-0.003	0.034	0.500	0.187	0.230	-0.112	0.087
PTQ	0.006	0.026	0.500	0.209	0.265	-0.021	0.107
PTQ-CPT	**0.084**	**0.085**	**0.500**	**0.609**	**1.558**	**-0.001**	**0.251**

Note. AAQ-II = Acceptance and Action Questionnaire – II; DASS = Depression (Dep), Anxiety (Anx), and Stress Scale – 21; GHQ-12 = General Health Questionnaire – 12; PTQ = Perseverative Thinking Questionnaire; PTQ-CPT = Perseverative Thinking Questionnaire for Clinical Psychology Trainees.

Table 4

Regression Model Comparison

Model	P(M)	P(M|data)	BF$_M$	*BF*	R^2
DASS-Total					
PTQ-CPT + DASST	0.063	0.460	12.775	1.000	0.306
PTQ-CPT + DASST + PTQ	0.063	0.277	5.742	0.602	0.316
PTQ-CPT + DASST + AAQ	0.063	0.106	1.777	0.230	0.317
PTQ-CPT + DASST + PTQ + AAQ-II	0.063	0.069	1.107	0.149	0.284
DASS-Depression					
Depression + PTQ-CPT	0.063	0.440	11.779	1.000	0.327
Depression + PTQ-CPT + PTQ	0.063	0.190	3.510	0.431	0.334
Depression + PTQ	0.063	0.123	2.110	0.280	0.315
Depression + PTQ-CPT + AAQ-II	0.063	0.082	1.348	0.188	0.327
DASS-Anxiety					
Anxiety + PTQ-CPT	0.063	0.584	21.051	1.00	0.298
Anxiety + PTQ-CPT + PTQ	0.063	0.173	3.145	0.297	0.302
Anxiety + PTQ-CPT + AAQ	0.063	0.127	2.173	0.217	0.299
Anxiety + PTQ-CPT + PTQ + AAQ-II	0.063	0.092	1.525	0.158	0.310
DASS-Stress					
PTQ-CPT + Stress	0.063	0.343	7.844	1.000	0.267
PTQ-CPT	0.063	0.180	3.301	0.525	0.243
PTQ-CPT + Stress + PTQ	0.063	0.110	1.850	0.320	0.271
PTQ-CPT + Stress + AAQ-II	0.063	0.108	1.817	0.315	0.271
GHQ-12					
GHQ + PTQ-CPT	0.063	0.394	9.757	1.000	0.247
GHQ	0.063	0.256	5.152	0.649	0.225
GHQ + PTQ-CPT + PTQ	0.063	0.094	1.553	0.238	0.248
GHQ + PTQ-CPT + AAQ-II	0.063	0.092	1.518	0.233	0.248

Note. AAQ = Acceptance and Action Questionnaire – II; DASS = Depression, Anxiety, and Stress Scale – 21; DASST = Total Score of the DASS; GHQ-12 = General Health Questionnaire – 12; PTQ = Perseverative Thinking Questionnaire; PTQ-CPT = Perseverative Thinking Questionnaire for Clinical Psychology Trainees.