

Cognitive Hypnotherapy and EMDR: The Longitudinal Effects on Trait Anxiety and Music Performance in Advanced Pianists

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ISSN: 2637-7802



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Submission: 📅 November 05, 2019

Published: 📅 November 21, 2019

Volume 5 - Issue 4

How to cite this article: Elizabeth Brooker. Cognitive Hypnotherapy and EMDR: The Longitudinal Effects on Trait Anxiety and Music Performance in Advanced Pianists. *Adv Complement Alt Med.* 5(4). ACAM.000616.2019.
DOI: [10.31031/ACAM.2019.05.000616](https://doi.org/10.31031/ACAM.2019.05.000616)

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Abstract

Investigations into the effect of trait anxiety on a music performance have mainly focused on the conscious mind with a paucity of research into the role that implicit processes exert. The aim of this research was to investigate Cognitive Hypnotherapy (CH) and Eye Movement Desensitisation and Reprocessing (EMDR) therapies that target implicit processes, to establish the long-term effect on trait anxiety in advanced pianists, and to further assess if a reduction in trait levels exerted a reciprocal influence on performance outcome. Participants were randomly assigned to one of two groups, CH or EMDR, and received two interventions of the designated therapy during a two-week period. Quantitative data were collected through the Spielberger State-Trait Anxiety Inventory (trait portion) at baseline ($n=46$) and at four months and one-year post-intervention (respectively $n=34$, $n=17$); baseline levels of trait scores were used as a control indicator. Qualitative information on performance experiences was documented at the same longitudinal monitoring points ($n=9$, $n=4$) through a self-report questionnaire pre-intervention and a log of experience post-intervention. Significant decreases below baseline trait scores were reported in both groups at the longitudinal measurement points. Comparative analysis of the qualitative questionnaires indicated that trait levels were related to performance outcome and that a significant reduction in trait anxiety exerted a positive effect on cognitions and performance. This is an important area for future research having broader implications in other fields: however further investigations and validation is required to confirm these effects.

Keywords: trait anxiety; music performance anxiety; psychodynamic therapies; implicit processes; longitudinal effects

Introduction

The purpose of this study is to provide evidence regarding the effectiveness of two interventions, Cognitive Hypnotherapy (CH) and Eye Movement Desensitisation and Reprocessing (EMDR), for the reduction of trait anxiety and to assess the reciprocal influence on music performance anxiety (MPA). Both therapies focus on automated or implicit processes no longer consciously perceived. The objective was to contribute to theories of cognitive anxiety and music performance on a longitudinal basis.

Trait anxiety and MPA

Trait anxiety is thought to be the most important moderator of stress reactivity. Traits reflect residues of memories no longer consciously perceived [1,2] and personalities with high trait anxiety are more susceptible to stress and perceive situations as threatening [3]. Anxiety has a two-factor structure having both trait and state components [4]. Wilson [5] argues that a moderate to high trait level can exacerbate state anxiety in a threatening situation; investigations support this [6-9]. During a music performance trait anxiety can be responsible for 25% of the variance in subjective state anxiety [10] with high levels of trait anxiety positively associated with higher state anxiety [11]. Negative fear reactions are triggered accompanied by self-deprecating tendencies, [12] catastrophising, [13] being out of control, loss of focus, and consequently performance deficits [14,15].

Trait anxiety and interventions for MPA

There appear to be few empirical studies investigating trait anxiety and its effect on MPA. An investigation using CBT+biofeedback+music relaxation showed some positive effects in the

reduction of MPA when advanced pianists self-reported reductions in both trait and state levels of anxiety [16]; however no longitudinal follow-up was conducted, therefore it cannot be determined if the reductions were maintained. This research was extended when a longitudinal assessment of the effect of CBT on trait anxiety was conducted with 54 orchestral musicians [17]. Although decreases below baseline levels were evident post-intervention, all trait levels had returned to baseline levels longitudinally at two months. The benefits of yoga and meditation were evaluated in a two-month programme with 45 orchestral musicians suffering from MPA [18]. In both treatment groups post-intervention participants self-reported decreases in MPA and trait anxiety; however, this was not sustained longitudinally at the one-year measurement point. A pilot study using yoga as an intervention for MPA reported large decreases in both state and trait anxiety levels which were sustained longitudinally at one year [19]; however longitudinally the limitation is the small sample size [8].

Psychodynamic interventions using CH and EMDR

There is little research into the effect of trait anxiety on MPA using CH and EMDR and no longitudinal investigations as far as the author is aware. Investigations using CH and EMDR were conducted with 46 advanced pianists suffering from MPA [6]. Participants were randomly assigned to a CH, EMDR or non-treatment group, given two sessions of the allocated therapy and tested pre- and post-intervention in two concert performances. Significant decreases in state anxiety were found post-intervention in both therapy groups but not in the control. EMDR also significantly reduced trait anxiety levels below baseline levels; however, CH did not. The effects of CH and EMDR were investigated [20] through 9 qualitative case studies pre- and post-intervention, documenting performance anxiety in music, sport and anxiety in the workplace. Post-intervention and longitudinally it was found that reduced state and trait anxiety had a beneficial effect on performance outcome.

Hypotheses

This study tests the hypotheses that:

1. Participants will report lower levels of trait anxiety at four months and one year post-intervention in comparison to baseline levels.
2. Both interventions, CH and EMDR, will be effective in reducing trait anxiety levels but EMDR will be significant in achieving this decrease below baseline levels.
3. Longitudinally participants will self-report a reduction in self-perceived cognitive anxiety, somatic/physiological symptoms of anxiety and more positive outcomes in performance.

Method

Ethical approval for this study was given by the University Faculty Research Ethics Committee at the University of Leeds (ref. number PVAR 10-042).

Overall design

The research was divided into two phases, a main and longitudinal study. This paper reports on the second phase focusing on the longitudinal effects of CH and EMDR on trait anxiety and its relationship with MPA. Three different measures of anxiety adhered to the principles of a pre-test/randomised two-group post-test investigation and comprised three key stages, testing trait anxiety at baseline and at two longitudinal monitoring points. Quantitative data were supplemented by qualitative data on subjective cognitive anxiety. Qualitative data allowed for self-evaluation of the participants' cognitive/behavioural aspects of performance through idiographic comparisons of performance experience pre- and post-intervention.

Participants

Phase 1 (main study): Forty-six advanced pianists (aged 18-26) from three higher education institutions were recruited after response to flyers and research presentations. A criterion was that they suffered from MPA (self-evaluated by the musicians).

Phase 2 (longitudinal study, four months and one year post-intervention): Quantitative assessment, $n=34$ (19 females, 15 males) $n=17$ (9 females, 8 males) respectively; qualitative assessment, $n=9$ (5 females, 4 males) $n=4$ (2 females, 2 males).

Materials and Measures

Quantitative

A quantitative assessment of state and trait anxiety was conducted at baseline through the State-Trait Anxiety Inventory [9]. This scale measures both state (STAI Y-1: 20 statements) and trait anxiety (STAI Y-2: 20 statements) using a Likert scale: the minimum is 20, the lowest level of anxiety, and the maximum is 80. At the longitudinal measurement points an assessment of trait anxiety was conducted using the STAI Y-2 portion of the questionnaire. This ascertained the effect of the therapies on trait levels over time and enabled comparisons with baseline measurements.

Qualitative

Two qualitative measures of MPA were completed by participants pre-intervention through a self-report questionnaire (SRQ) [6], and post-intervention at four months and one year through a log of experiences post-intervention (LEP). Both questionnaires, designed by the author, enabled self-assessment of MPA through idiographic reports of subjective concert experiences pre, during and post-performance, and allowed for qualitative comparisons pre- and post-intervention. The rationale for not using a standardized instrument of testing was based on the need to determine cognitive emotions and experiences at various times and situations. This was not wholly fulfilled by existing measurements in this area.

Content analysis was used in evaluating the detailed information received from participants' comments in each of the categories below (Table 1).

Table 1: SRQ and LEP: Self-assessment questionnaires.

SRQ	What were your thoughts/feelings/emotions during the days/weeks leading up to the performance?
	Did your feelings stay the same/grow stronger/grow weaker as the concert approached?
	Did you ever feel so strongly that you felt you might withdraw?
	How did you feel 15/30 minutes before performing at the venue?
	Did you experience any physical symptoms before/during your performance? If yes what were they and to what degree?
	Did they improve or adversely affect your performance in any way?
LEP	What were your thoughts/emotions/feelings pre- and during this performance?
	Did you experience any physiological/somatic symptoms at this time?
	What were your post-performance thoughts/feelings?
	Compare your performance experiences post-intervention with your pre-intervention experience during the main research period

Procedure

All participants gave written consent to participate in all components of the research and anonymity was provided. A manual randomisation protocol was adopted. Participants were assigned to a CH or EMDR group and given two one-hour therapy sessions of their allotted therapy over a two-week period. The therapies were conducted by the author, a qualified and experienced hypnotherapist and EMDR practitioner, who deemed that two therapies should be sufficient to effect a positive outcome.

Baseline measurements of trait anxiety were used as a control indicator for quantitative comparisons at the longitudinal measurement points. The STAI Y-2 was completed online by participants at four months and one year post-intervention and returned to the author. The scores were considered in conjunction with the self-evaluated performance experiences to establish whether a relationship exists between trait anxiety and MPA. Longitudinally it was not possible logistically for participants to complete the STAI Y-1 as completion immediately before each performance is required. Therefore, at the same measurement points the LEP was completed online, each specific performance dated and tracked through time and returned to the author. The qualitative data post-intervention were compared to the pre-intervention data completed at a concert performance in Phase 1 of the study. This enabled idiographic comparisons of performance experience pre- and post-intervention, and further allowed for comparisons with the quantitative data.

Summary of analysis procedure

Levels of change in trait anxiety were assessed on two fronts:

- A. Two ANOVAs were used to assess the effects of the therapies in the two different samples which indicated the effect of time.

- B. Pairwise comparison tests of variance were utilized to assess and identify subgroups which demonstrated the greatest significant difference post-intervention over time.

Results

Phase 1: Preliminary analysis

To establish if trait anxiety data were normally distributed across the sample a Kolmogorov-Smirnov (K-S) test (STAI Y-2) was conducted at baseline to establish the distribution of trait anxiety across all participants ($N=46$, $M=44.52$, $SD=8.578$, $p=.448$) which showed a normal distribution. A Pearson's Correlation test was applied at baseline (STAI Y-1 and Y-2), $r(46)=.403$, $p=.005$. This indicates a positive correlation between trait and state scores.

Phase 2: Cognitive anxiety (STAI Y-2)

Four months post-intervention

Hypothesis 1: participants will report lower levels of trait anxiety at four months post-intervention in comparison to baseline levels.

Hypothesis 2: EMDR will be significantly effective in reducing trait anxiety levels in comparison to CH.

An ANOVA was conducted at baseline (pre-therapy), and four months (post-therapy), testing the dependent variable (trait anxiety) and the two independent variables (therapy groups, and time). There was a highly significant main effect of time ($F(1,32)=18.22$, $MSE=58.75$, $p < .001$), demonstrating an overall significant difference in the mean at four month post-intervention in comparison with baseline. Pairwise comparisons with Bonferroni adjustments showed no significant difference in the effectiveness of the therapies and that change occurred equally in both groups ($p=.265$, 95% CI [2.38,-8.35]). Hypothesis 1 is therefore supported.

Hypothesis 2 is only partially supported as both therapies were significantly effective in reducing trait levels of anxiety. Figure 1 below illustrates the decrease in trait anxiety at baseline and four months post-intervention across the 34 participants.

Boxplot of the mean score of trait anxiety at baseline and four months post-intervention

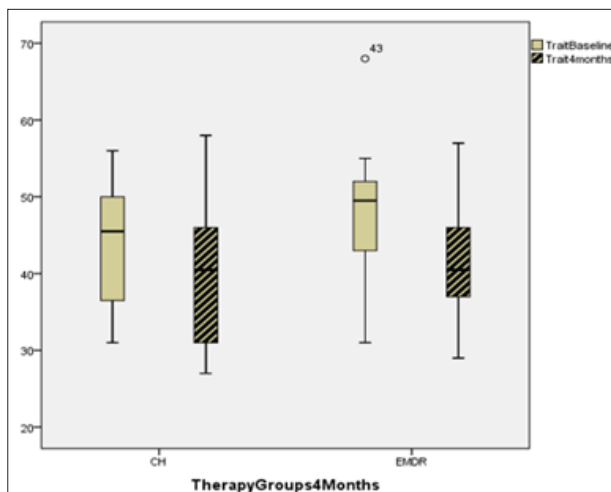


Figure 1: The standard error of the means of trait anxiety at baseline and four months post-intervention: Error bars show 95% CI of mean.

One year post-intervention

Hypothesis 1: participants will report lower levels of trait anxiety at one year post-intervention in comparison to baseline levels.

Hypothesis 2: EMDR will be significantly effective in reducing trait anxiety levels in comparison to CH.

A second ANOVA was conducted at baseline and one year post-therapy. It showed a significant main effect of time ($F(1,15)=16.94$,

$MSE 27.83, p=.001$). Pairwise comparisons with Bonferroni adjustments revealed no significant difference in the effectiveness of the therapies ($p=.143, 95\% CI [1.85-11.66]$) and that change occurred equally in both groups. This demonstrates that at one year post-intervention, the participants still displayed significant decreases in trait anxiety scores from their baseline measurements. Hypothesis 1 is therefore supported. Hypothesis 2 is only partially supported. Figure 2 below illustrates the decrease in trait anxiety at baseline and one year post-intervention across the 17 respondents.

Boxplot of the mean score of trait anxiety at baseline and one year post-intervention

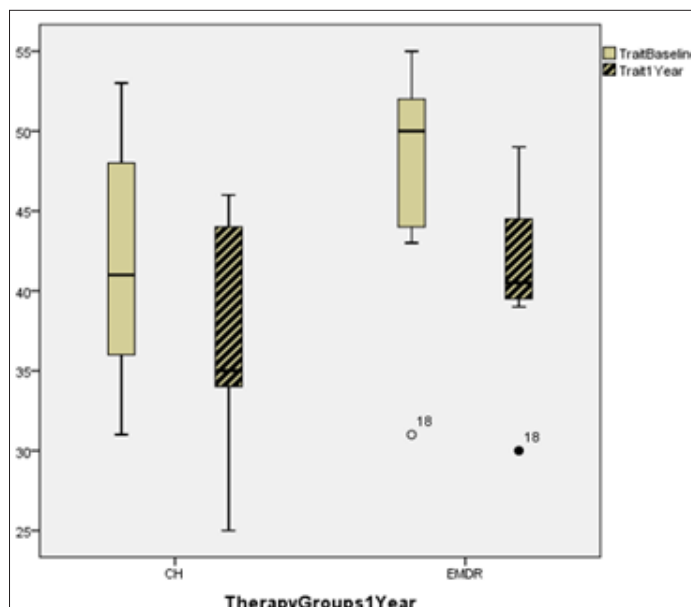


Figure 2: The standard error of the means of trait anxiety (STAI Y-2) at baseline and one year post-intervention: Error bars show 95% CI of mean.

At one year post-intervention:

- A. 15 respondents (88%) still showed decreases from baseline (two returned to baseline levels)
- B. Ten of the 17 respondents (59%) experienced further decreases from the four-month measurement point.

Qualitative self-reports: Log of experiences post-intervention (LEP)

Three abbreviated case studies are documented of those participants with the largest decrements in trait anxiety levels below baseline at the longitudinal measurement points. Each study displays the raw data (STAI Y-2) at baseline and post-intervention.

Self-assessment of performance comments on the SRQs (pre-intervention) is given alongside the LEPs (post-intervention) and considered in conjunction with the STAI Y-2 scores. Italicised text has been taken verbatim from the questionnaires. Detailed documentation of all nine case studies falls beyond the scope of this article but is referenced [21].

The following questions were reviewed by the author:

- A. What impact, if any, did decreased trait anxiety exert on cognitions pre-performance, during and post-performance?
- B. What effect did this have on performance outcome?
- C. How did this compare with performance experience prior to therapy?

The participant number and received therapy is given together with a brief summary of the subjective logs, illustrating the relationship between cognitions and performance outcome.

Participant MS64 (EMDR) four-month monitoring

STAI Y-2

- A. Baseline score: 54.
- B. Four months (post-intervention): 37 (-17 below baseline).

There was no response on the STAI Y-2 or LEP at the one-year measurement point from this participant; however, the case is included as it documents the second largest decrease in trait levels recorded in the research.

Self-report comments SRQ, pre-intervention

15-30 minutes pre-performance: *“was my most worried”* and during the performance: *“my right leg began to shake during the middle of the performance using the pedal, and my arms also shook a little bit. The symptoms definitely affected my performance in a bad way”*.

Self-report comments LEP, post-intervention

Four performances were reported at the four-month monitoring.

Performance 1: *“During the performance my mind went blank and slightly hindered my ability to perform. I felt more relaxed as the*

performance continued but wanted it to be over”. He reports being overly concerned with small flaws and mistakes, has negative perceptions and feels upset. However, post-performance on hearing the opinions of other audience members which were encouraging, his self-perception of his performance improves.

Performance 2: He reports feeling nervous but confident *“my mind went blank, but it did not affect my ability to perform the piece from memory”*. He still experiences somatic symptoms, however feels *“they were not disruptive to the performance”*.

Performance 3: Is a positive experience and he reports: *“it was almost enjoyable to play in front of a group of people I know”*.

Performance 4: He reports no nervousness beforehand and feels *“composed, prepared and positive”*. Post-performance he is positive and happy and feels confident regarding his ability to perform under pressure.

A desensitisation process appears to be operating here. Desensitisation occurs when musicians are exposed to the performance situation on a regular basis. With each subsequent performance the negativity is being replaced with more positive thoughts [22]. At Performance 4 he uses the word *“positive”* three times. He feels prepared and happy and reports: *“Overall, I felt like my ability to perform under pressure was at its best during that performance than it has ever been”*. It might be suggested that the greater positivity and confidence that he experiences is due to the exposure from performing on a more regular basis, and not to the therapies that he has received; but equally it could be hypothesised that this is due to a combination of both. However, at four months post-intervention his trait level of anxiety is still -17 points below baseline level. It could therefore be argued that the positivity and enjoyment that he experiences is due to the reduction in trait anxiety, and that without the lowered trait anxiety, desensitisation with each performance experience might not have occurred. Hypothesis 3 is therefore supported but it is difficult to ascertain if this is due to the EMDR therapy or to increased exposure to performance situations.

Participant MS21 (EMDR) four-month and one-year monitoring

STAI Y-2

- A. Baseline score: 52.
- B. Four months post-intervention: 37 (-15 below baseline).
- C. One-year post-intervention: 39 (-13 below baseline).

This participant regularly plays in public performances; however there appears to be heightened cognitive distress concerning the forthcoming performance pre-intervention.

Self-report comments SRQ

“Though I tried not to think too much about the performance I got more worried when the date approached. At a certain point I thought of cancelling (the night before).....as my turn approached, I became more anxious, I realised I was imagining a catastrophic performance. My heart beat faster, loss of muscle control (hands),

tension on the feet.....this adversely affected my performance....poor quality of sound, a feeling of lack of concentration, failed notes."

Self-report comments LEP

Detailed accounts of diverse performances post-therapy over the course of one year were self-reported.

Below is an overall comment from the participant: *"At some performances I can still feel some anxiety and experience some uncomfortable symptoms, but I am more focused and able to concentrate on the performance without the previous catastrophising. I feel better physiologically and am more aware in general and able to handle situations better since taking part in the research."*

Pre-intervention extreme cognitive anxiety is experienced to the point of withdrawing from the research. During the performance negative perceptions lead to catastrophising and he experiences physiological, somatic and cognitive symptoms of anxiety (lack of concentration). The belief that certain situations pose a threat to one's self-esteem leads to catastrophising [23]. Post-intervention it appears that large decreases below baseline in trait anxiety have had a positive effect on cognitive thinking, physiological/somatic symptoms and performance outcome. Pre-intervention (with an audience of peers) this very experienced pianist had negatively valenced cognitions. In comparison, during the high-powered recitals he has given since therapy, he has been generally more positive and relaxed. Hypothesis 3 is therefore supported.

Participant MS2 (CH) four-month and one-year monitoring

STAI Y-2

- A. Baseline score: 53.
- B. Four months post-intervention: 45 (-8 below baseline).
- C. One year post-intervention: 37 (-16 below baseline).

This participant was the most experienced performer in the research.

Self-report comments SRQ

15 minutes prior to playing she feels tense, has negative thoughts and experiences hands shaking whilst playing: *"I was worried that I would have a memory slip or make a mistake"*. A reduced confidence in one's ability to perform is believed to produce self-defeating thoughts, diminished behaviour mastery and heightened arousal [24].

Self-report comments LEP

Her performances post-intervention are diverse (chamber work, piano accompanist, concerto competition, solo recital). However she still has feelings of nervousness at the beginning of performances (in three instances) but reports no physiological symptoms. The main comment was that although nervous she felt in control. During a solo recital when two somatic symptoms of anxiety were experienced, she reports that this was possibly due to tiredness rather than nerves and that mentally she felt more positive: *"nervous for the first 20 minutes or so, then it got much*

better". There is no sign post-therapy in her varied performances of catastrophising which she self-reports in performance 1 of the research study. Overall her post-performance comments are encouraging. Positive, descriptive words are used: *'elated', 'exhilaration', 'having fun'*. However, she is still not totally confident in her abilities as a performer: *"who on earth would pay to come and watch me play?"* This participant recognises that she strives for the 'perfect' performance. Perfectionism can be a factor in instigating anxiety in performance and can have both a positive and negative effect [25]. However, she appears to be thinking more positively, recognising that a controllable amount can improve and heighten the quality of her performance. This corroborates Gellrich [26] who found that a small amount of anxiety can give the optimum performance level. A significant decrease in trait anxiety which continued to decrease in the absence of therapy (-16 below baseline at one year post-intervention) appears to be exerting a more positive effect on her mental attitude and performance outcome. Instead of negative rumination on certain aspects of her performance she is now analysing why these may have occurred. Hypothesis 3 is therefore supported.

Discussion

This study reviewed the importance of trait anxiety, its influence on personality and its effect on music performance. Through quantitative and qualitative investigations both trait and state anxiety were considered in relation to MPA. On the question of trait anxiety, contrary to expectations, it was found that both therapy groups, after only two therapy sessions, demonstrated a significant decrease below baseline trait levels at both longitudinal measurement points. It had not been hypothesised that CH would be effective in achieving this result as in the main study EMDR but not CH was significant in this respect. However, the reason for this may be that in comparison with the main study, a greater number of participants in the CH group responded at the longitudinal measurement points and may have been suffering from a form of focal anxiety. Focal anxiety is a category of anxiety that is a condition that resides in an otherwise healthy functioning individual and is confined to specific situations [27]. Where there are no deep-seated psychological issues CH can be very effective in treating this form of anxiety. Another unexpected finding was that, in the absence of further therapy, trait anxiety levels continued to reduce (MS2) appearing to have an accumulative effect over time. It is suggested that a correlation exists between duration and outcome in therapy and that some variables are more positively affected over time so that positive perceptions are ongoing and grow stronger [28]. Previous research using functional magnetic resonance imaging (fMRI) pre- and post-intervention indicated that short-term psychodynamic treatment leads to changes in fronto-limbic circuitry changing brain functioning in anxious patients so that anxiety levels are normalised post-treatment [29,30].

On the question of the LEPs, self-report information gave an idiographic holistic picture of music performance as well as the sustainability of CH and EMDR over time. The qualitative information from the LEPs taken at four months and one year post-intervention, in comparison with the SRQs, suggests that CH and EMDR had a positive effect on cognitive perceptions, physiological

and somatic symptoms and performance outcome. The comments highlighted that although a nervous apprehension could still be experienced, participants generally felt more confident, focused, and were calmer and more in control of the situation; some were excited at the thought of performing and little catastrophising was experienced.

However MPA is complex. The case studies reported above support previous research and highlight this complexity:

- A. Cognitive distortions, catastrophising, reduced confidence (MS21, MS2)
- B. Heightened heart rate, loss of muscle control in hands and feet (MS21)
- C. Hands shaking, arms and legs shaking (MS2, MS64).

The findings suggest that a significant decrease in trait anxiety below baseline levels at the longitudinal monitoring points had a positive effect on subjective levels of anxiety in performance as documented on the LEP thus supporting Hypothesis 3 posed earlier in the study.

Limitations

A lack of control group weakens this study: inclusion of such would ascertain if changes occur in the dependent variables over time with non-exposure to interventions. A further limitation was the varied response rate on the LEP at the measurement points. A larger response would have provided greater statistical power allowing stronger comparisons with the quantitative/qualitative data.

Conclusion

This investigation has shown that trait anxiety is not fixed but mutable and plays an important role in the field of MPA. It has important clinical applications demonstrating that CH and EMDR can decrease anxiety rapidly (two sessions) and that this effect is long-lasting. It is an original contribution to research and to our understanding of trait anxiety and its relationship to MPA; it has called into question the current literature in the field. Further investigations and validation are now required with a larger sample and a control. Longitudinal studies should now be conducted comparing CH and EMDR with standard practice (currently cognitive behavioural therapy), looking at cost-effectiveness and the number of sessions required to effect positive change. Further to this, investigations with the additional use of brain scans using the fMRI approach should be carried out to determine what changes occur in the brain after only two treatments with these therapies.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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