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Lisa Wake Margaret Leighton

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Pilot study using Neurolinguistic Programming (NLP) in post-combat PTSD

Lisa Wake and Margaret Leighton

Lisa Wake is a Psychotherapist, based at Awaken Consulting & Training Services Ltd, Northallerton, UK.
Dr Margaret Leighton is a Science Writer, based at, Cambridge, UK.

Abstract

Purpose – *The purpose of this paper is to determine if neurolinguistic programming (NLP) tools and techniques were effective in alleviating the symptoms of posttraumatic stress disorder (PTSD) in clients from the Military and Emergency Services.*

Design/methodology/approach – *This project ran at the “Healing the Wounds” charity in Bridgend. All clients were opportunistic, having self-referred to a charity specifically set up to support Veterans from the Armed Forces. In total, 29 clients from an initial cohort of 106 clients provided pre and post data using Depression Anxiety Stress Scale (DASS) and the NLP Wheel of Life scale. Interventions included a range of NLP techniques, addressing self-reported symptoms.*

Findings – *Differences between DASS scores before and after treatment are very highly significant. t-test analysis infers that these results are indicative of the overall response from the clients in this study.*

Research limitations/implications – *Limitations of the study include: client group; significant levels of incomplete data for the total study group; therapist effect and therapist training; treatment methodology.*

Originality/value – *Data suggest that NLP has potential as a therapeutic tool in the treatment of symptoms of anxiety and depression associated with a self-report of PTSD. An observation is proposed that these candidates experience an improvement in their emotional state when NLP is used which is statistically significant ($p < 0.001$) both for overall DASS score averages and also for each of the three DASS categories (Depression, Anxiety and Stress). Stress was the highest scoring category prior to treatment for these clients; the reduction in their stress symptoms contributed most substantially to the overall reduction in average DASS score, indicating an improvement in their emotional state.*

Keywords PTSD, DASS, Neurolinguistic programming, NLP, Stress disorders – posttraumatic, Veterans

Paper type Research paper

Introduction

Our aims in publishing this analysis are to open the conversation between interested scientific researchers and clinicians on how best to investigate and develop neurolinguistic programming's (NLP's) contribution to the provision of effective therapeutic care for armed forces veterans and other posttraumatic stress disorder (PTSD) sufferers.

The current treatment of choice for PTSD recommended by National Institute for Health and Care Excellence is cognitive behavioural therapy (CBT) (Ehlers *et al.*, 2005; Figley, 2002; Foa *et al.*, 1991, 2005). Yet a review conducted by Kar (2011, p. 167) reports that “non response to CBT by PTSD can be as high as 50 per cent”. Other therapeutic approaches currently being used to treat PTSD in veterans are Eye Movement Desensitisation and Reprocessing and NLP.

A freedom of information request made to the Ministry of Defence (MOD) (Ministry of Defence (MOD), 2013) for data on the numbers of Ex and currently serving forces personnel with PTSD between January 2010 and September 2013 offered the following information:

- The MOD do not hold data on personnel diagnosed with PTSD.
- Data were offered of the numbers of personnel disabled and awarded a war pension for PTSD and numbers of personnel offered compensation for PTSD.

Kevin Richards (Healing the Wounds) gave access to the data and contributed to amending systems to enable capture and transfer of data for analysis. Carol Richards and Rachel Phillips contributed to providing the therapeutic intervention. Dr Susie Linder Pelz, Dr Rick Gray contributed to editing the draft paper. Authors of the paper undertook this work in a pro-bono capacity as volunteers of the NLP Research and Recognition Project (www.nlpandr.org).

- Current serving personnel data was available for those in receipt of mental health services.
- Incidence is thought to be 1.8 per 1,000 of serving personnel.
- “There was a significant increase in the rate of (serving) personnel assessed with PTSD in 2012 compared to 2011. Based on numbers previously published by Defence Statistics, there was an 18 per cent increase in the number of PTSD episodes of care between 2011 ($n = 267$) and 2012 ($n = 316$). The inclusion of DMICP as a data source in April 2012 resulted in an increase of 6 per cent ($n = 334$) in the number of PTSD. Taking both changes into account, there was an overall increase of 25 per cent in 2012 compared to the previous year” (MOD, 2013).
- “Between 1 January 2010 and 30 June 2013, 294 Armed Forces personnel who were admitted (to) an MOD in-patient facility had no diagnosis recorded at the time of their admission. Therefore, the numbers presented for UK armed forces personnel with PTSD should be regarded as a minimum” (MOD, 2013).

There are at least two UK veteran's charities (Veterans at Ease, Co. Durham and Healing the Wounds, S. Wales) known to the authors who are consistently using NLP with single diagnosis and co-morbid PTSD. Both charities report seeing clients who have previously tried CBT and gained no symptom alleviation. Each charity also reports therapeutic effect when using NLP. One of these has actively participated in collecting data from their client group, the other is working with a US project to develop a study using the reconsolidation of traumatic memories (RTM) protocol. The data reported in this paper is from the former charity based in S. Wales.

NLP

NLP is an applied psychology that facilitates the analysis and reproduction of excellence in a range of clinical and non-clinical settings as demonstrated in these peer-reviewed articles (Bigley *et al.*, 2010; Churches and West-Burnham, 2009; Gray, 2002, 2010; Gray and Liotta, 2012; Juhnke *et al.*, 2008; Muss, 1991; Simpson and Dryden, 2011; Stipancic *et al.*, 2010; Wake, 2008, 2011; Weaver, 2009; Witt, 2003, 2008). It is a way of modelling exceptional and resourceful behaviours, making these transferrable to others, and of changing un-useful or pathological behaviours. NLP methodology offers a systematic approach to the observation, analysis and replication of behaviour. It provides specific assumptions about the nature of behaviour and its organisation that allow for the construction of testable models of behaviour. Like behaviourism and cognitive psychology it provides no consistent theory of personality but rather focuses on the description of behaviour from the perspective of the client's subjective experience. Between the initial observation of the behaviour and the final outcome (be that a model, procedure or technique), it produces a series of successive approximations of the behaviour under study which upon refinement yield a testable model or technique for replicating or altering that behaviour (Wake *et al.*, 2013).

NLP has been the subject of considerable criticism in academic and clinical psychology departments for the lack of robust clinical evidence. A recent systematic review by Sturt *et al.* (2012) used a freedom of information act request to NHS organisations to identify spending on NLP training or services over a three-year period. Sturt's review identified ten experimental studies, five of which were randomised controlled trials (RCTs) and five were pre-post studies. Four RCT's reported no significance between groups and the fifth reported favourably for the NLP group. Three RCTs and five pre-post studies reported within group improvements. Of these papers only one study scored high for research quality, with the remainder having poor or medium quality. The study concluded that “There is little evidence that NLP interventions improve health related outcomes. This conclusion reflects the limited quantity and quality of NLP research, rather than robust evidence of no effect” (Sturt *et al.*, 2012, p. 757).

Wake *et al.* (2013) present a reasoned and evidenced argument for the clinical effectiveness of NLP, bringing together 14 clinicians, researchers, psychologists and psychiatrists as contributors to this publication. The publication presents B, C and some D level studies of NLP techniques in the treatment of phobias anxiety, PTSD, depression and addictions, alongside a supported commentary of other therapeutic applications.

Subsequent to the publication of this book, the first research grant funding has been allocated to a US pilot study investigating the effectiveness of the RTM protocol (Gray and Liotta, 2012) with US veterans experiencing PTSD (www.nlprandr.org).

Methods

The aims of the study were:

1. to assess the emotional state of a group of armed forces veterans suffering from symptoms of anxiety and depression that were concurrent with a self-report of PTSD as a result of experiences encountered during active service;
2. to monitor the effectiveness of NLP-based interventions in alleviating the symptoms associated with their condition; and
3. suggest improvement in the design of ongoing research on the effectiveness of NLP in therapeutic contexts.

This project ran at the "Healing the Wounds" charity in Bridgend, Wales during 2011 and 2013. All clients were opportunistic, having self-referred to a Charity specifically set up to support Veterans from the Armed Forces. The researchers were invited to evaluate the study data after the study had been commenced and were not involved in the study design, hence this being a historical cohort study. A total of 106 clients were included in the initial study population.

Pre and post data were collected during the client's visit to the Charity and was available for 36 (33.9 per cent) clients, of which 29 returned full data for all assessment questions, making them suitable for statistical analysis for treatment effect. All remaining clients had incomplete data. Some pre-data were not collected by the Charity because of lack of administration staff, and within the post data sets, some clients did not return their post-assessment forms despite telephone follow-up. Data returns for three months post-treatment was collected either by telephone interview or by interview in person upon clients' return to the Charity for follow-up.

The following initial assessment data were collected from each client ($n = 36$). Previous therapeutic treatment (61.1 per cent); prescribed medication (66.6 per cent); drug and/or alcohol intake (58.4 per cent); presenting symptoms (5.5 per cent asymptomatic); number of days treated (50 per cent treated for three days); pre-existing diagnosis of anxiety (47.2 per cent); combat zone (3.65 per cent non-military). Each of these relied on self-report by the client and client's family if present.

Clients were seen by two people trained to NLP Master Practitioner level. The total training attended by each of the NLP personnel was seven days at practitioner level and both had attended two separate 14 day Master Practitioner courses. All courses attended by the staff were non-clinical and the course leaders were also non-clinical. Neither staff member were veterans nor could it be ascertained if the course leaders were veterans. Both personnel also commenced counselling skills training during the study period.

Ethical considerations

All clients were self-referred into the service. Each client was asked to read and sign a statement of service from the Charity that clearly stated that data were being collected for use in a research study to evaluate the effectiveness of the service. As an historical cohort study, ethical considerations are limited to those implemented by the Charity who informed their clients of the service and the collection of anonymised data for research purposes. All clients accessing the service were offered the right to withdraw from the service and to withdraw from data collection without it impacting on their receipt of the Charity's services. The researchers have adhered to the ethical principles of anonymity and confidentiality of data.

Interventions

The NLP trained personnel adopted an eclectic approach working with the presenting issue rather than follow a prescribed protocol. Most clients were offered more than one intervention,

with no report given of how many times each intervention was used with an individual client. Interventions consisted of the following tools and techniques:

1. Time Line Therapy™ (James and Woodsmall, 1988; Hall and Bolstad in Linder-Pelz, 2010) – A technique based on the principles of NLP for releasing negative emotions and revisiting limiting decisions, that directs the client, in a dissociated state, to return to significant past events with “new resources so that negative emotions can be released or limiting decisions revised” (Stedman’s Medical Dictionary) (50 per cent of clients, $n = 36$).
2. Drop Through – A process within Time Line Therapy™ that aids the release of emotions from gestalts or clusters of emotionally impactful memories (13.8 per cent).
3. Perceptual Positions – (Grinder and DeLozier, 1987) A method of viewing an experience through a number of different perspectives. The client is associated into First Position – experiencing an event through our own eyes; Second Position – experiencing something as if we were in the other persons shoes; and Third Position – studying back and perceiving the relationship between ourselves and others from an observers perspective (5.5 per cent).
4. Parts Integration – A reframing process that recognises that we may have less integrated or less conscious aspects of ourselves that are in conflict with our more conscious self. Parts work derived from the theories of family therapist Satir (1972) and the internalised parts found in Gestalt Therapy (3.6 per cent).
5. Anchoring – The use of stimulus responses to alter states, derived from the Operant Conditioning Theory of Skinner (1957) (8.3 per cent).
6. Relaxation – The use of Milton Model Language Patterns to induce a hypnotic state through visualisation (Bandler and Grinder, 1975, 1977) (8.3 per cent).

Assessment tools and methodology

Each client was assessed at entry to the service using a standardised assessment tool – Depression Anxiety Stress Scale (DASS). The DASS has high internal consistency (Lovibond and Lovibond, 1995) and has a set of three self-report scales of levels of Depression, Anxiety and Stress.

The Depression scale assesses dysphoria, hopelessness, devaluation of life, self-depreciation, lack of interest/involvement in life, inability to enjoy life, inertia.

The Anxiety scale assesses autonomic arousal, musculo-skeletal symptoms, situational anxiety and subjective experience of anxious affect.

The Stress scale assesses difficulty in relaxing, nervous arousal, feelings of being upset or agitated.

Additionally each client was asked to complete a self-report assessment using the Wheel of Life (WOL) (McDermott and Jago, 2002). The WOL is a self-assessment procedure from the NLP methodologies repertoire. This method invites the client to focus on their self-perceptions in eight aspects of their lives (business and career, personal development, family and close friends, possessions and adventure, spirituality/personal philosophy, intimate relationships, health and fitness and finances). To make the WOL self-assessment, clients are presented with a pictorial “wheel” whose spokes are labelled with these different life areas. This overlies a Likert scale of concentric circles. Clients are asked to assess how satisfied they are with their values in the contexts of the areas covered in the WOL, e.g. health, relationships, career, family. They are then invited to plot their current location graphically using the Likert scale on this assessment sheet, and “join the dots”.

WOL assessment provides some important differences from the DASS approach:

1. The client’s awareness is focused into what they are currently able to do, and highlights areas of positive achievement.
2. The approach is visual, and aside from the category labels themselves, is non-verbal. This absence of direct questions means that the frame of assessment does not intrude into their

mental process, allowing their responses to be potentially more non-verbal and therefore better integrated with their feelings.

3. The graphic form of the wheel presents them with an overview which implies that they can work towards achieving a better balance between the areas of their life. This visual frame operates as an invitation as to the area most relevant to the setting of outcomes and goals.
4. When the client joins up their points on each category scale, this produces a graphic plot; a "shape" which represent client's sense of emotional wellbeing. When their scores improve, they plot out and then see this representation of their state of wellness expand. This is an important reinforcement of the progress that they have made in their recovery journey.

Data prior to and after treatment were analysed using a statistical comparison of means. The DASS methodology recommends statistical analysis using Z-scores. The Z-test is a powerful analytical tool for comparing sample means, based on Central Limit Theorem and as such is robust, providing that these contain relatively large numbers of sample observations, usually nominated as 30 or more samples. For smaller data sets, the *t*-test is applied to compare means. The equation for *t* is derived from the Z-test, and includes a correction factor which diminishes as the number of samples increases.

Statistical analyses in this study follow the convention of, for data sets of 30 or more observations, using a Z-test, and where <30 observations are available, a *t*-test is applied – but with one exception. This is the initial comparison of pre-post treatments. These data set (*n* = 29) are of borderline size for the Z-test, so both Z-test and *t*-test calculations were made for these data. The results for Z and *t*, and consequently their *p*-values, were found to be identical. Since the DASS protocol specifies the Z-test, and the two test results are congruent, the analytical method referred to in the results is the Z-test. Z-tests alone were applied to the WOL data (*n* = 32). For the comparison of DASS scores for immediately post-treatment and after three months (section iii of the results) and the comparison of DASS and WOL as an assessment tool (section iv), *t*-tests are applied.

Since these observations are derived from the same candidates before and after treatment, all values of Z and *t* quoted here refer to calculations for paired data. Values for *p* are quoted as applicable for a two-tailed test. The two-tailed nature of the Z-test assumes that the difference between means can be in either direction, i.e. either one higher or lower relative to the other.

Results

(i) Comparing the overall emotional state of clients prior to treatment with their state immediately post-treatment (mean DASS scores)

Initially, the effectiveness of NLP was examined for these clients by comparing DASS assessments pre- and post-treatment. Although the overall number of candidates receiving treatment in this study was much larger, due to the varied capture of assessment data, only 29 returns included complete answers to all 42 DASS questions before and after treatment. These returns were selected for further analysis (Table I).

All of the study candidates with complete pre- and post-treatment records showed a reduction in their DASS totals as a result of treatment (i.e. a positive therapeutic result). This means that the treatment programme resulted in a reduction in negative feelings for these candidates, and consequently an improvement in their emotional state.

Table I Z-scores (matched pairs) for DASS comparisons pre- and immediately post-treatment, overall and for separate DASS categories				
	<i>Total DASS</i>	<i>Depression</i>	<i>Anxiety</i>	<i>Stress</i>
Z	-8.498	-6.271	-6.633	-10.442
<i>p</i> -value	<0.001	<0.001	<0.001	<0.001

Figure 1 displays the mean DASS scores, which are 87.5 ± 11.6 prior to and 24.4 ± 9.6 one week after NLP intervention; the error bars highlight the 95 per cent confidence interval of two standard errors around the mean. The result for Z in this comparison, -8.498 , is significant ($p < 0.001$), suggesting that the shift in these clients' emotional state may have arisen from having received their NLP interventions. However, it does not consider other variables outside of the interventions offered that may have impacted on their emotional state.

(ii) Comparing the relative levels of depression, anxiety and stress in clients prior to and immediately post-treatment (DASS category data)

Z-scores comparing differences across the DASS categories (depression, anxiety and stress) before and after treatment were significant ($p < 0.001$). This difference was evident across all three DASS symptoms categories, but was most substantially contributed to by the reduction in stress; the initially highest scoring category in pre-treatment data. Figure 2 displays DASS

Figure 1 DASS total average scores pre- and immediately post-treatment

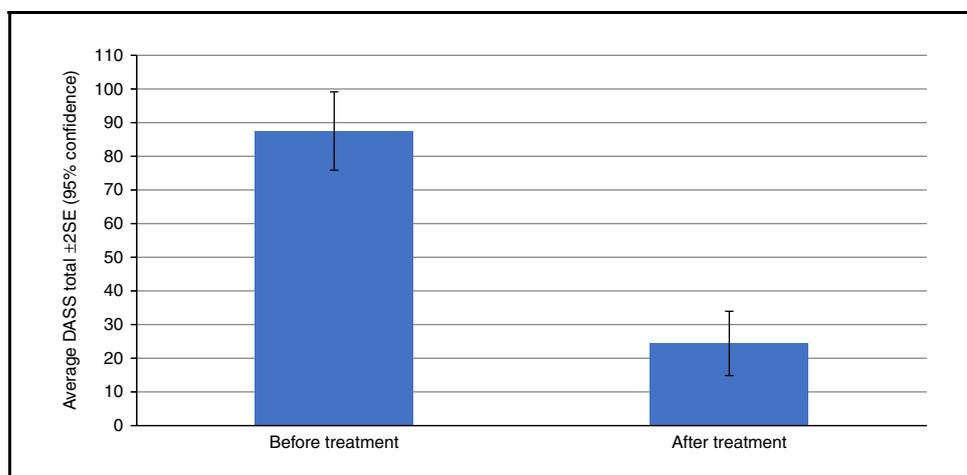
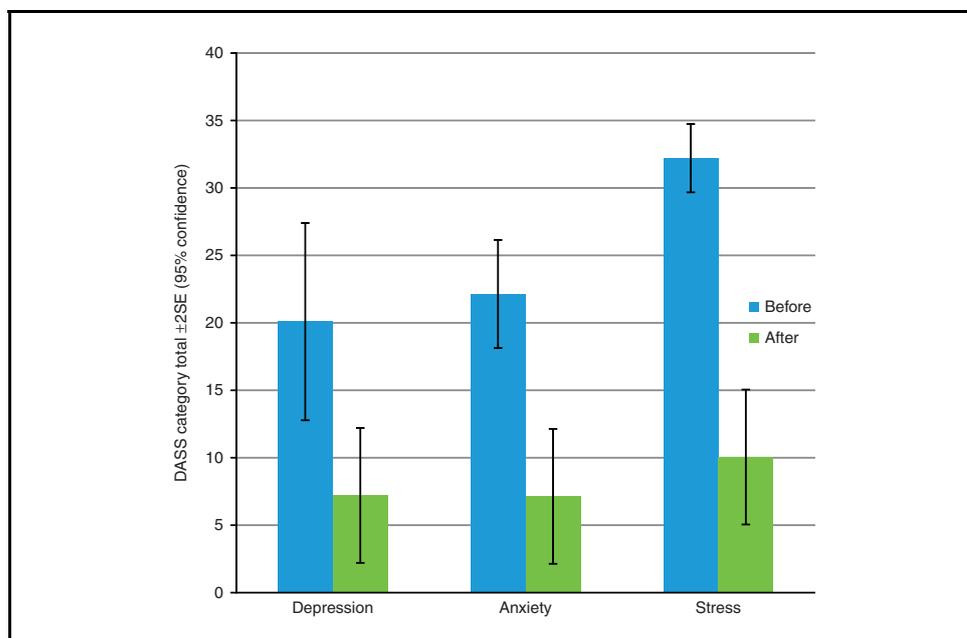


Figure 2 Differences in average DASS category scores before and after treatment



category mean scores before and one week after NLP intervention. Bars show the respective standard error of the mean (95 per cent confidence interval). Actual mean values with data scatter indicated by standard error are for depression, pre-treatment 20.1 ± 7.3 falling to 7.2 ± 3.4 ; for anxiety 22.1 ± 4.0 falling to 7.1 ± 2.9 and for stress the initial mean of 32.2 ± 2.5 fell to 10.1 ± 3.5 . The post-treatment reduction in symptoms ameliorated the between-category skewedness caused by the disproportionately high stress score, returning clients to a more consistent score distribution across the categories.

From the DASS category data (Figure 2), it appears that the overall DASS differences are predominantly due to stress reduction, although reduced anxiety and depression also contribute to the reduction in symptoms. Normal DASS scores (i.e. considered not clinically significant) are Depression 0-4, Anxiety 0-3, Stress 0-7.

These clients' symptoms fell within an initially "extremely severe" level at commencement of treatment, and moved to borderline "mild/moderate" on completion of therapy.

(iii) Assessing the effectiveness of treatment over a three month timescale

The overall data for the project included eight candidates' records that returned complete scores pre- and immediately post-treatment, along with assessments after three months. These data subset ($n = 8$) are too small to be appropriately analysed using the Z -test, so the t -test for matched pairs was applied to this data. This showed that for this data subset, the mean DASS totals, which were 102.9 ± 31.0 prior to and 13.5 ± 8.3 immediately after treatment, followed the trends seen in the larger data set. The result for $t(-6.50, p < 0.01)$ for this comparison was significant. Separating these data into their constituent categories, values of t for depression, anxiety and stress were respectively -3.60 , -6.25 and -10.45 (all significant at $p < 0.01$). These results mirror the Z analysis for the larger ($n = 29$) data set despite the smallness of the sample size. This implies that the data subset provides an appropriately representative sample to use for comparison of the reduction in symptoms immediately after treatment and after three months.

For this calculation, although the overall mean total DASS score increased slightly from that immediately pre-treatment for these clients, the result for $t(-3.52)$ still returned a significant difference ($p < 0.01$; one-tailed test.) Values for t across the categories pre-treatment vs three months post-treatment, were as follows: Depression $-2.48, p < 0.05$; Anxiety $-3.97, p < 0.01$; Stress $-3.72, p < 0.01$.

As for the results pre- and immediately post-treatment, a reduction in symptoms is seen across all three categories for pre- and three months post-treatment. There were no significant differences between the immediately post-treatment results and the later post-treatment results ($t = 1.67$).

The graph in Figure 3 displays the total average DASS scores for this small data subset. The standard error bars show our 95 per cent confidence interval for the standard error of the mean. These error bars are larger than for the $n = 29$ data set, reflecting the additional correction which is applied to standard error when the sample data set is small.

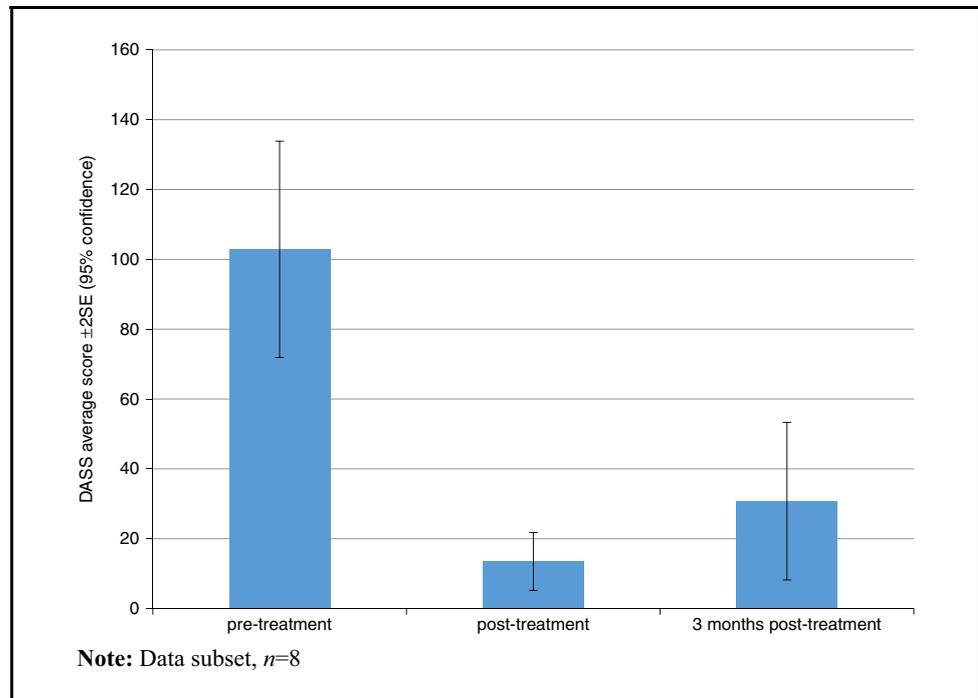
Despite the higher relative within-data variability that results from this small size of this data subset, these results suggest that improvements in the candidates' emotional state were evident immediately after treatment and were still persisting after three months. The error bars show that differences in means one week post-treatment and three months later are not significant. Hence these findings can be regarded as indicating a lasting and sustainable solution for this group of clients over the timescale of this study.

This implies that a subsequent study, providing a larger data set and following candidates' progress in the short to medium term would also show that the positive effects of treatment, as evidenced by the Z analysis in sections (i) and (ii), are lasting and sustainable.

(iv) Comparing pre- and immediate post-treatment DASS assessments with WOL pre-post results

The DASS test is a well-researched and well respected industry standard method for assessing emotional state. However, its assessment questions are framed as negatives. The way in which a question is asked sets a frame which directs the type of response which is required.

Figure 3 DASS total averages before, after and three months after treatment



NLP methodology frames its approach (and hence phrases its questions) in terms of positive outcomes and goals. Therefore, an NLP practitioner would choose for preference a method of monitoring and assessing the efficacy of treatment which reinforces their clients' healing process, reinforcing the progress they have made in improving their emotional state.

An additional consideration is that there may be some subtle linguistic differences in the question frames between categories for DASS. Questions of a more specific nature, concerning the numbers of incidents in which particular stress and anxiety behavioural symptoms arise may be easier for clients to perceive and subsequently quantify in terms of an improvement in their emotional state, as compared with more general questioning focusing their awareness into ongoing feelings of malaise and depression.

Analysis of WOL data

A total of 32 candidates had records returning WOL scores prior to and after treatment, of which 19 also returned full pre- and post-treatment DASS assessments, which were included in the earlier Z analysis. The post-WOL assessment was conducted blind to the client's original assessment.

(a) *t*-test comparisons for tandem DASS and WOL assessments (19 candidates)

The 19 candidates' data is suitable for *t*-tests comparisons of the pre- and post-treatment mean scores for both DASS and WOL assessment methods.

The *t*-test assesses the significance of the differences in mean score before and after treatment (as does the Z-test). Comparing WOL against the trusted and reliable "standard" of the DASS result for the same candidate set, provides an indication of the efficacy of WOL as an assessment method in this context (Table II).

Both DASS and WOL statistical analyses for the same client subset ($n=19$) returned a significant value for *t*. Prior to *t*-test analysis, an *F*-test was used to check that the sample variance was within the parameters required by the *t*-test (i.e. that the data are normally distributed) (data not shown). The slightly lower *t*-value for the WOL assessment reflects the lower variance in the WOL scores relative to DASS. Since both methods return a significant

Table II WOL and DASS results from *t*-test analysis of the same 19 candidates who completed returns for both assessment methods

	WOL	DASS
<i>t</i>	9.49	-7.83
<i>p</i> -value	<0.001	<0.001

difference between means, this difference in score is not relevant to the interpretation here. These *t*-test results suggest that within the context of this study, the DASS and WOL assessment methods appear comparable as a method for monitoring a client's emotional state.

Based on this result, a Z-test analysis was performed of the available WOL data.

(b) Z analysis of WOL mean scores pre- and post-treatment.

The 32 candidates with complete pre- and post-treatment records for WOL provide a suitably sized data set for Z-test analysis.

Analysing the total WOL mean scores for these 32 candidates pre- and post-treatment returned a value for Z of 12.473 (the paired test result is identical) This indicates a significant difference ($p < 0.001$) between clients' scores before and after treatment. All candidates recorded an improvement across the WOL areas, some returning the maximum possible improvements on this scale (a score of 10) for some categories.

The WOL assessments result in an increase in score when the client's self-perceptions improve. The post-treatment mean total (55.8) relative to the pre-treatment mean total (25.8) indicates that the NLP treatment programme had a positive effect on these clients' emotional state.

Discussion

The usable data from the Bridgend study (36 clients from a total of 106 participants) shows a substantial improvement in the emotional state of armed forces self-reporting PTSD as a result of the NLP-based interventions. Overall, after treatment the pooled DASS average score ($n = 29$) fell from 87.5 ± 11.6 (2SE) to 24.3 ± 9.5 . These differences between DASS scores before and after treatment are significant ($p < 0.001$) for both overall scores and for each of the category averages.

The *t*-test analysis of the smaller data set ($n = 9$) used to compare results after one week and three months post-treatment, shows that improvements persist, at least for the duration of the study period. This difference is significant ($p < 0.01$) even for this small sample, allowing us to infer that this result is likely indicative of the overall response from clients in this study. DASS data from this trial demonstrate that these clients' most severe symptoms were encountered in the "stress" category. The authors recognise that considerable variables may and do exist for the clients within this study, and that variables such as medication, other support mechanisms, lifestyle changes, employment status may all have influenced some of the changes seen here. This study does suggest that the NLP intervention may have resulted in substantial improvements in clients' emotional state across all categories, and particularly in the reduction of stress symptoms. There were no significant differences between these categories averages post-treatment. These findings demonstrate that the NLP approach may be effective at reducing and resolving these armed forces veterans' symptoms. These treatments may have enabled these capable and resourceful individuals to move closer to recovering their lives and capabilities.

Client outcomes such as these suggest that further studies in this area are warranted, and it is acknowledged that these results are the consequence of a therapeutic process and not a standardised procedure. As such these data are not comparable to a pharmaceutical study, and so we cannot evaluate these findings in the same way. The analysis does not consider therapist effect which is known to influence outcome. The individually tailored nature of the client interventions is appropriate to and a product of the NLP paradigm of patient care. This means

that in the present study, we have no standard set of methodologies which were applied to all clients. Nor would it be appropriate in NLP terms to do this.

Implications of the type of intervention and of the study design

This study cannot be compared to other studies with similar client groups, the majority of which use clinical protocols and randomisation. A discussion of the implications of a tailored NLP approach and the limitations of this study are considered here.

(i) Variability in the clients' entry behaviour

Overall, the study group showed a high variability in the symptoms they presented, a substantial variation in the length of time suffering these symptoms, and a varied experience of prior treatments and previous or ongoing prescribed medications. This means that each client presented a unique symptoms portfolio from the spectrum of disorders associated with self-reports of PTSD. Slightly under half of the participants had a pre-existing diagnosis of anxiety. Just under two-thirds of these had undergone some form of prior therapeutic treatment. Around half had received or were currently receiving prescribed medications for stress, across a spectrum of pharmaceutical categories. Against this backdrop of client variation, all participants had self-referred to the charity for help. This implies that their common factor is a sense of personal responsibility and determination to seek help in finding a solution to their situation.

(ii) Between-client variability in the prescription of interventions

The NLP methodology is client-focused, meaning that procedures were selected on a case-by-case basis, and these interventions were drawn from the five techniques described in this paper. A significant consideration for this study is the confounding variable of each practitioner. The choice of intervention was made by each client's NLP practitioner, and this decision was dependent upon the practitioners' assessment of the client's needs and their own expertise. The practitioners in this study drew upon their own judgement and experience, rather than applying any prescriptive protocol for assigning interventions. There is no decision-making matrix currently adopted within the NLP methodologies repertoire, and due to the diverse choice of interventions, the same end results can be attained by different routes.

(iii) Between-client variability in the scaling of assessment data

DASS is considered an appropriate method for assessing and monitoring the mental health of these clients and is supported by considerable research (see Lovibond and Lovibond, 1995), hence its adoption as an industry standard for assessing the emotional state of clients presenting with trauma symptoms. Research underpinning this method demonstrates that individual clients' self-ratings are a reliable and internally consistent procedure for assessing a clients' emotional state (Lovibond and Lovibond, 1995).

Whilst the research implies that for an individual client, their perceptions of the symptoms that DASS assesses are sufficiently consistent before and after treatment, the grading of that scale is personal, and is not incremental. Hence, there is between-client variation inherent to the data captured by the procedure.

The WOL tool from the NLP techniques repertoire has many desirable attributes relevant to clinical application, two of which are pertinent to this study. First, it fosters a more balanced perspective of the client's life situation (rather than being symptoms focused). Second, the WOL tool works visually and removes language-based leading of the client. This enables the act of self-assessment regarding their current state as a work in progress over which they have choice, and the potential of an improvement in their future possibilities.

Like the DASS assessment, the WOL procedure is prone to the same between-client scaling differences, and so is a subjective measure. Comparing data from the subset of clients ($n = 19$) for which DASS and WOL scores were both available, a t -test analysis returned a significant difference ($p < 0.001$) for both assessment methods. As with the DASS data, evaluation of the WOL pre- and post-treatment scores using the Z -test ($n = 32$) showed significant differences in their respective mean scores prior to and after treatment ($p < 0.01$). These results suggest

that in the context of this study, DASS and WOL report similar changes over the timescale of the study for these clients. This highlights the possible applications of WOL as a complimentary and therapeutically useful assessment tool for this cohort group.

Limitations of the study

1. Client group – clients were self-referred in most cases and in many cases had received a clinical diagnosis of either PTSD, or anxiety or depression or a combined diagnosis by clinicians unconnected with the Charity or were self-diagnosed. The Charity did not use any standardised assessment tool, DSM iv or ICD 10 criteria to measure evidence of or level of PTSD. The Charity do not consider themselves a clinical service, neither do they have the skills to conduct a clinical assessment. Clients approaching the charity were made aware that they were not receiving clinical support. Pre-existing psychological conditions were recorded if the client self-reported. All emotional states relied on subjective reports by the client and family where present.
2. Data – although data from 106 clients was available, complete data to conduct pre and post studies was only available for 29 clients. It could be suggested that only those clients who experienced significant reduction in symptoms returned their data; equally it could be suggested that clients who did not return data were no longer experiencing problems. The potential for responder bias would need to be considered in any future research in this area.
3. Staff – training attended by the two staff members involved in the study was limited and the content of this training was not shared with the researchers. The researchers had no connection with the Charity other than to provide research support and advice. Competency of personnel was not assessed, neither was their level of clinical supervision or clinical awareness. Both staff members also commenced training in counselling skills during the final weeks of the period of the study, so this may have had a small effect on the latter group of clients. No data are available on the trainers who trained the staff in using NLP methodologies other than the courses being generalist NLP programmes with trainers not listed as psychotherapists or counsellors on any UK public directory. Therapist effect is likely to have had an influence on outcome and is a consideration in this cohort study.
4. Methodology – the methodology used was varied across clients and was specifically tailored to each client's self-reported symptoms, with most clients being supported with more than one NLP process. No one client had the same treatment process applied in the same way, with the most frequently used tool, Time Line Therapy™, being offered to 50 per cent of all clients.

Conclusions

Our intention in this paper is to present an evaluation of what the Bridgend study data can tell us, rather than proposing that this study can be generalised at this stage. Our analysis highlights the effectiveness of NLP interventions for these clients' outcomes and suggests that NLP has potential as a therapeutic tool in the treatment of PTSD. We can thus accept the suggestion that these candidates experience a clinically relevant improvement in their emotional state when NLP is used as an intervention.

This improvement in symptoms in those clients for whom there is pre and post data, particularly with regard to stress response provides sufficient indication that further studies are warranted. Taking this investigation forward requires that the methodological and design considerations which we have raised here are addressed in a way which enables future studies of the clinical effectiveness of NLP to be reliable and verifiable.

In reviewing these verification criteria, an obvious means of promoting consistency between practitioners within a trial would be to implement some form of decision matrix as to what type of intervention to use. An NLP methodology is currently being trialled in the US and can be delivered via the RTM protocol (Gray and Liotta, 2012). It is proposed that an RCT is conducted comparing the use of the RTM protocol from NLP with the PTSD protocol from CBT.

The limitations of this study will inform the development of a future study. It is recommended that this study be repeated and addressing the considerable limitations highlighted here. A systematically designed study would provide evidence of the validity or invalidity of the results observed with this cohort.

We wish in future work to develop a programme of clinically relevant research into the applications of NLP. This requires a methodology and assessment procedure which can accommodate a client-focused and personally tailored therapeutic approach. This requires future investigations to pioneer a more robust procedural process that allows for a reliable consistency and comparability between clients and across studies.

Glossary

CBT	Cognitive Behavioural Therapy
DASS	Depression Anxiety and Stress Scale
DMICP	Defence Medical Information Capability Programme
EMDR	Eye Movement Desensitisation and Reprocessing
MOD	Ministry of Defence
NLP	Neuro-Linguistic Programming
PTSD	Post-Traumatic Stress Disorder
RCT	Randomised Control Trial
RTM	Reconsolidation of traumatic memories
WOL	Wheel of Life (NLP state self-assessment tool)

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About the authors

Lisa Wake is the Director of the Awaken Consulting and Training Services Ltd, and the Awaken School of Outcome Oriented Psychotherapies Ltd, both of which provide NLP-based training.

Lisa is also the European Director for the NLP Research and Recognition Project in a pro-bono capacity, and is an Advisor and Accreditation Panel Member for ANLP (Association of NLP). She is a lead Editor of *The Clinical Effectiveness of Neurolinguistic Programming* and has published four books, provided contributions to a further two books, and four academic papers in peer reviewed journals on the applications of NLP. Lisa is also a regular writer for non-academic journals. She has completed an MSc in Advanced Clinical Practice focusing on NLP and is currently a Doctoral Student at the University of Surrey researching the applications of NLP with adolescents at risk of offending behaviour. Lisa is an Honorary Fellow of the UKCP. Lisa Wake is the corresponding author and can be contacted at: lisa@awakenconsulting.co.uk

Dr Margaret Leighton has 12 years experience in life sciences research, has taught statistics and biology to undergraduates and postgraduates, and is a trained NLP Master Practitioner. She is currently pioneering a web-based science communications outreach project at the Department of Earth Sciences, University of Cambridge.

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