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Abstract. The intrusive symptoms of PTSD impact thousands of state and local police officers, armed service men and women and civilians of every description. Current treatments rooted in extinction protocols require extensive commitments of time and money and often have limited effectiveness. This study reviews the research regarding the Visual-Kinesthetic Dissociation Protocol, also known as the Rewind Technique, and suggests an explanatory mechanism for its reported efficacy. The technique is notable for its lack of discomfort to the patient, the possibility of being executed as a content-free intervention, its speed of operation and its long term, if largely anecdotal, efficacy. It examines two important mechanisms that explain when treatment does and doesn't work: extinction and reconsolidation. It then reviews specific diagnostics for extinction and reconsolidative mechanisms. Suggestions for future research are provided.

Keywords: PTSD, PTSD treatment, PTSD models, Visual-Kinesthetic Dissociation, Rewind technique, extinction, reconsolidation

The Visual/kinesthetic dissociation (V/KD) protocol (as discussed below) is an intervention originally designed in the early 1980s for use with phobias. The protocol is one of many anecdotally supported interventions that emerges from the field of Neuro-Linguistic Programming (NLP). NLP is an approach to modeling, replicating and transforming behavior that includes a number of specific therapeutic techniques; among these is the V/K D protocol.

NLP finds its roots in models of the therapeutic techniques of Milton Erickson, Virginia Satir and Fritz Perls. It has generated a great deal of anecdotal evidence of effectiveness but has undergone little empirical testing. There have been recent calls from within the NLP Community for more research into its efficacy claims (Bandler & Grinder, 1975, 1979; Bolstad, 2002; Bostic St Clair & Grinder, 2002; Dilts, Grinder, Bandler & DeLozier, 1980; Wake, 2008).

The V/K D procedure first appeared in Bandler's *Use Your Brain for a Change* (1985). An expanded version of the procedure, and its first application to post traumatic stress disorder (PTSD), appeared in the Andreas' *Heart of the Mind* (Andreas & Andreas, 1989). Dilts and DeLozier (2000) provide a slightly different version of the protocol in their *Encyclopedia of Systematic NLP and New Coding*. The technique has also been popularized in the UK as the *rewind* technique (Guy & Guy, 2003; Muss, 1991, 2002).

Post traumatic stress disorder (PTSD)

PTSD is defined by the DSM-IV in terms of five criteria. The first criterion is the traumatizing event. In order to qualify as a traumatizing event both of the following must appear:

1. the person experienced, witnessed, or was otherwise confronted with one or more events that actually involved or threatened death, serious injury or some other threat to the physical integrity of that individual or others.
2. The individual's response involved intense feelings of horror, fear

or helplessness.

The next three criteria consist of three symptom clusters, the re-experiencing cluster, the avoidance / numbing cluster and the arousal cluster. According to Foa & Meadows (1997) the intrusion or re-experiencing symptoms include the hallmark signs of PTSD including nightmares, intrusive thoughts and flashbacks. The avoidance group includes efforts to avoid memories of the traumatic experience and symptoms of emotional numbing. The third symptom cluster includes symptoms of hyper-arousal including sleeplessness, irritability and hyper-vigilance. The fifth criterion includes the impact and duration of the symptoms (American Psychiatric Association (APA), 1994).

Diagnosis is made when symptoms (at least one from the re-experiencing cluster, three from the avoidance cluster and two from the hyperarousal cluster) cause clinically significant distress or discomfort and have persisted for a minimum of one month (APA, 1994).

Previous Investigations

Reports of the efficacy of the Visual Kinesthetic Dissociation technique (V/KD), cover nearly a quarter century. Among the anecdotal reports are those provided by Richard Bandler, Steve and Connie Andreas, Robert Dilts, and William McDowell who relate that each of them has treated thousands of persons suffering from PTSD and phobic conditions with immediate, lasting results from this short term intervention. In many cases they report complete symptom alleviation after long term follow-up (Andreas & Andreas, 1989; Bandler, 1985; Dilts & Delozier, 2000; McDowell & McDowell, nd).

Psychological investigations of the technique are limited to three scientific studies, two reviews and several mentions in the literature. Each of the referenced studies recommends the

technique as a valuable tool for treating PTSD and makes suggestions for further research (Carbonell & Figley, 1999; Dietrich, Baranowsky, Devich-Navarro, Gentry, Harris, & Figley, 2000; Figley, 2002; Hossack & Bentall, 1996; Koziey & McLeod, 1987; Muss, 1991, 2002). There is also one non-peer reviewed study that is reported on-line (Guy & Guy, 2003).

Koziey and McCleod, writing in 1987, reported their experiences in treating two rape victims with a mixed technique employing Bandler's three-place dissociation in combination with hypnotic trance. An initial pretreatment session was used to review the technique and to complete an assessment package. In a second session, the authors used hypnotic trance to provide a resource state to ensure that the traumatic memories would not become overwhelming. One week later, in a second treatment session, the patients completed another set of evaluations, were hypnotized and then the hypnotized subjects were led through the three part dissociation. Consistent with the standard procedure, they were led through an imagined, dissociated review of the trauma in which they watched themselves, watching themselves, watching a movie of the trauma. The movie began with a still image of the client in a safe time before the traumatic event, projected on an imaginary screen. The experience ended with a safe place after the trauma with each of the clients merging with their own dissociated identities and sharing the learnings from their experience. Unspecified measures of 28 dependent variables showed significant changes in pre-post comparisons with near total abatement of symptoms in one of the subjects.

Muss (Muss, 1991, 2002) reports having used the technique first with 19 police officers who met DSMIII diagnostic criteria for PTSD, and later with all manner of traumatized persons (Muss, 2002). In nearly all of the 19 police cases, he reports remission of symptoms. He provides no control conditions and few details of the study, however, in long term follow ups (3 months to three years) in 15 of the 19 cases, he reports a complete absence of intrusive imagery.

Crucially, as noted by Andreas, Muss indicates that the technique is appropriate to clients whose primary symptoms are experienced as intense, suddenly arising experiences of the trauma, usually experienced as flashbacks or panic reactions (Andreas, 2008, Personal communication).

A third study, by Hossack and Bental (Hossack & Bental, 1996) included five subjects who were treated with a combination of guided visualizations, Jacobsen's deep muscle relaxation and two sessions of the VK/D protocol. Although one of the five subjects was unable to complete the visualizations associated with the VK/D procedure, the four completers all reported significant reduction of intrusive images and were able to return to normal life activities.

Guy and Guy report that the technique (renamed by Muss (1991, 2002) as the rewind technique) was applied to thirty people between 2000 and 2002. All were diagnosed with PTSD or partial PTSD. Participants were interviewed ten days post-treatment. Forty percent adjudged their improvement as extremely successful, fifty-three percent as successful and seven percent as acceptable. None rated the treatment either as poor or as a failure (Guy & Guy, 2003).

The V/K D Procedure

The following description of the basic protocol depends upon extensive personal communications with Steve Andreas, Robert Dilts and Tim Hallbom and continued reference to their descriptions of the protocol in several written sources (Andreas & Andreas, 1989; Bandler, 1985; Dilts & Delozier, 2000).

The procedure is relatively simple:

1) Insure that the client has a phobic type response to the stimulus or the trauma. That is, in the presence of reminders of the trauma, he must experience the quick onset of fear, panic, flashbacks; his life may be characterized by hypervigilance, he may be nervous around others, he may need to be in control and unable to feel safe; and he may have nightmares in which the

trauma reappears. The protocol is inappropriate for PTSD sufferers for whom these are not the main symptoms.

2) Evoke the trauma, with or without description (most NLP interventions can be completed content free.).

3) Interrupt the re-emergence of the trauma as soon as the client begins to show physiological signs of its onset. Changes in breathing, skin color, posture, pupil dilation and eye fixation are typical signs of memory access. As they appear, the state is to be broken by reorienting the client to the present, by changing the subject, redirecting their attention into a different sensory system, or firing off a preexisting anchor. However it is accomplished, it is important to stop the development of the symptoms before they take control of the client's consciousness.

4) After a few minutes away from the trauma, ask the client to think of a time before the trauma when they were doing something pleasant in a safe, neutral context.

5) Instruct the client to imagine that they are sitting in a movie theatre and that they are watching that scene on the screen.

6) Have the client imagine that they can float out of that body (in the theatre) and into the projection booth, perhaps behind a thick window, where they can watch themselves, seated in the theatre, watching the safe, neutral picture.

7) Ask the client to imagine that the movie on the screen, watched by their dissociated body seated in the theatre, becomes a black and white movie of the trauma that runs from the safe place before the trauma to a safe place after the trauma.

8) From the perspective of the safe projection booth, have the client focus on the responses of the dissociated watcher in the theatre as THEY watch the movie.

9) Repeat the black and white movie process until the client can do it with no discomfort.

10) After completing the dissociated movies, have the client imagine floating down from the projection booth and stepping into their own body that is seated in the theatre. Having re-associated into that body, let them imagine getting out of the seat, walking to the movie screen and stepping into the black and white image of the safe, neutral activity with which they ended the black and white rehearsal.

11) As the client steps into the movie screen, have them turn on the sound, color, motion, smells and tastes of the safe neutral representation on the screen. Then, instruct them to experience a movie of the trauma in full sensory detail, BACKWARDS and very quickly (two to three seconds). Let them end the movie with a still color picture of themselves in the safe, neutral place from before the problem ever started.

12) Repeat the reversed representation enough times so that it can be done easily and quickly, and the client has a sense of being comfortable. When the client can repeat the process easily with no experience of discomfort the process is finished.

13) Attempt to reactivate the trauma. Ask the client to go back to it, to think of things that normally brought the problem to life. Test for the trauma in as many ways as can be found.

14) If the client still has an experience of distress repeat the reversed movie several more times.

15) When the trauma cannot be evoked, the procedure is over.

Unlike other treatments for phobias or PTSD, the V/K D either eliminates the memory completely, or leaves the memory intact but without traumatic affect so that the client can now talk about it without distress. In other treatments, especially exposure treatments, this does not happen and the results tend to be impermanent. Why? Gray and Liotta (In Press) have suggested

that the mechanism of memory reconsolidation can explain these results.

Reconsolidation

Current studies in the neurophysiology of learning and memory discuss the phenomenon of reconsolidation. Reconsolidation is an emerging concept that has strong support from major thinkers in the field of learning and memory but is still subject to debate within the community (Akirav & Maroun, 2006; Alberini, 2005; Cao et al., 2008; Debiec, Doyre, Nader, & LeDoux, 2006; Duvarci & Nader, 2004; Forcato, Pedreira & Maldonado, 2009; Gharakhani, Matthew & Charney, 2006; Lee, Milton, & Everitt, 2006; Milekic & Alberini, 2002; Nader, Schafe, & LeDoux, 2000; Riccio, Millin & Bogart, 2006; Tronel, Milekic, & Alberini, 2005).

Briefly, when a memory is created, it passes through several stages, at first it is maintained as a short term phenomenon that is largely electro-chemical in nature. Over time memories become subject to a long term process of neural change (long term potentiation or LTP). This stage depends upon the repeated production of proteins that foster the growth of dendritic spines—the parts of the nerve that control the width of the synapse. After varying time frames, including as little as 24 hours for emotional memories (in higher organisms), the ‘memory trace’ becomes solidified as an assemblage of synaptic connections throughout the brain. This is basic memory consolidation (Amaral, Osan, Roesler, & Tort, 2008; Kandel, 2001; Schiller, Monfils, Raio, Johnson, LeDoux & Phelps, 2010).

Each time the memory is activated after its consolidation as a long term memory trace, the chemical processes that created the neural trace are reactivated. If the circumstances are similar to the original event, the synaptic connections are maintained or strengthened. If, however, the situation has significantly changed, the connections themselves can change. In the first case the memory is strengthened, in the second it may be modified or erased. The repeated strengthening or weakening of the memory connections through the reactivation of protein synthesis is called reconsolidation because it repeats the original process by which the trace was consolidated (Alberini, 2005; Hupbach, Hardt, Gomez, & Nadel, 2008; Labar, 2007; Lee, 2009; Loftus & Yuille, 1984; Tronel et al., 2005).

In order to change a memory using this process, it is important to stop the expression of the response before it becomes fully conscious. For a traumatic memory, this means interrupting the memory before it becomes overwhelming. In the V/K D protocol this is done as soon as the client’s physiology *begins* to reflect changes consistent with trauma. If, in the process of activation, the accessed memory is allowed full expression, the structure of the memory will be strengthened in its current form and will resist efforts to change it. Further, *if the memory is allowed full expression, the therapist runs the risk of retraumatizing the patient* (Gray & Liotta, in press).

If the activation is sufficiently brief but still too long to support reconsolidation, extinction mechanisms are invoked. Extinction does not affect the original memory structure, but

creates a new memory that is associated with the same circumstance. Extinction memories have some ability to block the expression of the original memory but they do not change it. In extinction, the original memory is masked, not changed (Lee, 2009; Pedreira, Perez-Cuesta, & Maldonado, 2004).

Extinction, especially as it is applied to traumatic memories is problematic in that extinction memories are subject to decay so that spontaneous recovery, the return of the original memory is almost assured. Extinction also depends heavily upon context. The new memory that masks the original experience is often limited to the specific kinds of circumstances in which the new learning occurred; extinction memories do not generalize easily to other contexts. These problems have plagued PTSD treatments based on exposure and the extinction mechanism (Gray & Liotta, in press; Schiller et al., 2010)

When the memory has been activated for a sufficiently short period and interrupted before its full expression, the reconsolidation phenomenon opens a temporal window during which new versions of the experience may be introduced, the emotional impact of the event can be changed or (theoretically) the memory may be erased completely (Kindt, Soeter & Vervliet 2009; Schiller et al., 2010).

While it should be noted that the evidence for the mechanism of reconsolidation comes largely from animal models, there exists an abundance of evidence that shows that mechanisms of learning and memory are conserved across species (Forcato et al., 2007; Kandel, 2001; Pedreira, et al., 2004).

Studies with human subjects using both pharmacological and behavioral agents to disrupt reconsolidation of the target memory have supported the pre-clinical data. The phenomenon has been demonstrated in declarative, episodic and procedural memory (Forcato et al., 2007; Forcato et al., 2009; Hupbach, Gomez, Hardt, & Nadel, 2007; Hupbach, Gomez, & Nadel, 2009; Hupbach, Hardt, Gomez, & Nadel, 2008; Walker & Brakefield, 2003).

Kindt, et al. (2009) has illustrated pharmacologically mediated (propranolol) blockade of reconsolidation in conditioned startle responses in humans. In a more recent replication of that research Soeter and Kindt (2010) illustrated that reconsolidative inhibition of the fear memory persisted at a thirty-day post treatment trial, in spite of the subjects' continuing ability to describe

the previously fearful situation. Schiller et al. (2010) has used behavioral interference to produce the same effect in a conditioned fear response.

In the V/K D protocol, a quick and partial evocation of the traumatic memory is terminated before it either retraumatizes the patient or becomes strong enough to reinforce the underlying problem. During this period of labilization, multiple strata of new meanings are added to the memory structure. The dissociated black and white movie provides a multi-leveled opportunity for reshaping the memory. First, it is triply dissociated (Dietrich, 2000; Hossack & Bentall, 1996; Koziy & McLeod, 1987; Muss, 2002). Second, insofar as it is a voluntary re-experience of the trauma the context is restructured as voluntary rather than involuntary. This is what various authors have described as *prescribing the symptom* (Bandler & Grinder, 1979; Erickson, 1980; Haley, 1973). It is also a direct remedy for the loss of control described by Foa as a significant contributor to PTSD symptomatology (Foa & Meadows, 1997).

As noted, reconsolidation protocols depend upon a brief reactivation of the traumatic memory followed, after stimulus cessation, by an intervening amnesic or confounding event. For experiences subject to amnesic reconsolidation, insofar as a sufficiently intense memory is introduced during the labile phase of reconsolidation, the memory may be disrupted, erased or modified. After the VK/D process, the original memory becomes either inaccessible, innocuous or is transformed into a similar but nonthreatening memory. Human studies of the reconsolidation phenomenon have found that although the affective dimensions of previously negative memories are gone, the events remain accessible on a declarative level so that they can be discussed without retraumatizing the client. Similarly, clients who have undergone treatment with the VK/D protocol retain declarative and episodic access to the stimulus event but without

the traumatic affect (Andreas & Andreas, 1989; Bandler, 1985; Dilts & DeLozier, 2000; Kindt et al., 2009; Lee, 2009; Lee, Milton, & Everitt, 2006; Riccio et al., 2006; Soeter & Kindt, 2010).

Discussion

PTSD is a problem that is currently affecting as many as 15 to 17% of returning Iraqi veterans and 11% of those returning from Afghanistan. Reports indicate that up to 40% of sufferers remain untreated. Aside from cultural issues that discourage mental health treatment, the long-term commitments required by standard treatment modalities and inconsistent results do little to change motivation to obtain treatment (Hoge et al., 2004; Schiller et al., 2010).

The VK/D model is supported by 25 years or more of anecdotal reports covering thousands of patients. The intervention does not re-traumatize the patient and can be completed in as little as 45 minutes. Although only subject to three peer-reviewed evaluations in the last twenty-five years, each of the evaluations deemed it worthy of further investigation. One author, Muss, has continued using the technique and through his efforts it is now a recognized treatment for PTSD in the UK (Carbonell & Figley, 1999; Dietrich, 2000; Koziey & McLeod, 1987; McDowell & McDowell, nd; Muss, 1991, 2002).

Until recently, the possible mechanism of action for this highly innovative treatment was difficult to specify. Here, an argument for a mechanism based upon the emerging evidence for memory reconsolidation has been presented that is congruent with the structural elements of the intervention and predicts similar results (Dietrich, 2000; Hossack & Bentall, 1996; Koziey & McLeod, 1987; McDowell & McDowell, nd).

The material on reconsolidation not only explains why the VK/D protocol is

reported to work so well, but it also suggests a testable, theoretical mechanism that can explain the kinds of permanent change often seen in NLP interventions. Reconsolidation may be described in terms of syntactical constraints that define a more general paradigm that invokes reconsolidative memory change. The elements are: learning, temporal delay, reminder, interruption, new learning. These may be used to provide a theoretical base that will encourage the refinement and testing of other NLP-based interventions. For comparison, the language of NLP, as applied to the problem memory, may be stated in parallel with the paradigm described above as follows:

Formulation	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
NLP	Briefly Elicit problem state	Pattern interrupt	Pause	Elicit desired or alternate behavior	Test
Behavioral/Neurological	Reminder of previous learning	Termination of Response	Pause	Amnestic stimulus	Test

Given the understanding that memories can be permanently changed by observing these constraints, the reconsolidation paradigm provides a means for designing interventions with a firm neurological base; a new possibility in the field of NLP.

Suggestions for further research

As noted, reconsolidation protocols depend upon a brief reactivation of the traumatic memory followed, after stimulus cessation, by an intervening amnestic or confounding event. In the V/KD protocol, the memory is briefly activated and several layers of dissociative experience and confounding imaginal memories are introduced during the (presumed) labile period. After the V/KD process, the original memory becomes either inaccessible, innocuous or is transformed into a similar but nonthreatening memory. Human studies of the reconsolidation phenomenon have found that although

the affective dimensions of previously negative memories are gone, the events remain accessible on a declarative level so that they can be discussed without retraumatizing the client. Similarly, clients who have undergone treatment with the V/KD protocol retain declarative and episodic access to the stimulus event but without the traumatic affect (Andreas & Andreas, 1989; Bandler, 1985; Dilts & Delozier, 2000; Kindt et al., 2009; Lee, 2009; Lee, Milton, & Everitt, 2006; Riccio et al., 2006).

This analysis leads to several falsifiable predictions and diagnostic indicators of the underlying mechanism in PTSD treatments. Because the mechanism outlined here depends upon the known process of reconsolidation, interventions for PTSD may be behaviorally evaluated in terms of their results to determine whether extinction or reconsolidation is operative. Where extinction mechanisms have been invoked, spontaneous recovery, contextual renewal, reinstatement and rapid reacquisition will characterize the post treatment period and further treatment will be necessary in order to deal with the intrusive elements of the disorder (Bouton, 2004; Bouton & Moody, 2004; Dillon & Pizzagalli, 2007 ; Massad & Hulsey, 2006; Rescorla, 1988; Vervliet, 2008). Where reconsolidative mechanisms have been appropriately marshaled, the memories will be transformed, rendered inaccessible and, even if accessible to declarative and episodic recall, they will have been rendered non-traumatizing. The resulting change in experience will not be subject to spontaneous recovery, contextual renewal, reinstatement and rapid reacquisition (Cao et al., 2008; Duvarci & Nader, 2004; Forcato , Burgos, Argibay, Molina, Pedreira, & Maldonado, 2007; Kindt et al., 2009; Lee et al., 2006).

Although a test of these observations could be constructed by pursuing either pharmacological interventions or behavioral amnestics, because this is an NLP-oriented

approach a behavioral amnestic would be more appropriate. Moreover, in line with recommendations by Schiller et al. (2010), behavioral approaches are relatively less invasive and can verify the behavioral predictions that arise from the model.

These predictions can be tested behaviorally in terms of treatment outcomes in an experimental setting in which PTSD patients are randomly assigned to a VK/D treatment group, a standard extinction protocol group and a wait-group control. They should be evaluated for the presence of PTSD using any of a number of highly reliable and well validated instruments for the presence of PTSD as defined by the DSM criteria. Post treatment testing, employing the same instrument(s) used at intake, should occur at termination and at one and three months post treatment.

In line with the exclusion criteria emphasized by both Muss (1991) and Andreas (2008, personal communication), subjects who have developed significant symptoms beyond the root symptoms of PTSD, such as substance use disorders and severe interpersonal deficits should be eliminated from the study. In light of the need to eliminate pre-existing conditions that could confound the results, all subjects should be subjected to psychiatric evaluations. Persons with pre-existing Axis One disorders and significant personality disorders should be excluded from the study.

It would be expected that the VK/D group would show significant symptom remission at one and three month follow-ups with continuing improvement over time. The extinction treatment group would be expected to show initial symptom improvement with some decline in adjustment over time as the concomitants of extinction: spontaneous recovery, contextual renewal, reinstatement and rapid reacquisition manifest themselves.

After follow-up, in which they would be expected to perform least well, the wait-group

controls would be offered treatment using the modality of their choice.

Future research into this technique should look towards large scale trials of the protocol in the treatment of PTSD. The international troops returning from service in various theaters of war could provide a significant test population for this already established and relatively unknown treatment. There remain hundreds of thousands of war victims, refugees from earthquakes and tsunamis who would provide a significant pool of possible subjects.

Follow-up studies and surveys to take advantage of the now anecdotal evidence compiled by NLP practitioners would also be instructive. Such follow-up studies could provide crucial long-term reports of the incidence of post treatment relapse that would be capable of falsifying the proposal that the technique is rooted in reconsolidation rather than extinction.

Further research might also investigate the construction of other interventions that depend upon reconsolidation. For instance, just as the current technique relies in part on a conditioned resource to amplify dissociation, it may be possible to use NLP procedures such as collapsing anchors to create an even more efficient restructuring using a powerful, positive resource state as a conditioned response whose introduction during the labile period would create a memory transformation or erasure. The current explanation invites further exploration of the mechanism of reconsolidation for other interventions that have been to now, poorly understood.

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