Inspyrd Angels:
A Pilot Initiative Exploring a Neuroscience Informed Coaching Protocol for Survivors of Human Trafficking

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About the Author

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Allen Kanerva is an international Neuro Linguistics Programming (NLP) trainer and former Director of Training for the Research and Recognition Project. For a decade he has successfully coached traumatized clients as well as train trauma recovery practitioners across North America, Europe, the Middle East, Southeast Asia, Australia & New Zealand. He is a former military officer turned humanitarian worker turned trauma rehabilitation advocate and coach.

He is currently the president of INSPYRD Inc., a trauma healing advocacy and NLP training institute. His mission is to end the stigma associated with being traumatized by changing the narrative:

"trauma is an injury that can heal."

Disclaimer

This pilot was conducted as a service-evaluation and quality-improvement initiative involving existing clients of Rising Angels Awareness & Restorative Care. It does not constitute a clinical trial or academic research study and was undertaken to inform internal program development and service delivery decisions.

The author is a certified NLP trainer and trauma-informed coach. The protocol described is a neuroscience-informed coaching model delivered within a practice-based evidence framework and is not presented as a clinical or diagnostic treatment.

All results should be interpreted as preliminary and exploratory. Individual outcomes may vary. Agencies, practitioners, and readers are encouraged to use their own clinical judgment and organizational protocols when considering the potential application of these findings.

Dedication to Katarina MacLeod

Katarina MacLeod, a survivor of human trafficking, is the embodiment of courage and compassion. She lived through what most people only read about, and she turned that pain into purpose through the founding of Rising Angels, an agency that spreads awareness and provides restorative care for survivors of human trafficking and sexual exploitation. For years, she was the one answering the phone at two, three, sometimes four in the morning when a fellow survivor was breaking down, when a woman was ready to give up, or when someone simply needed to hear another human voice that understood. Katarina was that voice. Always.

Her work didn't happen in boardrooms or during daylight hours. It happened in the dark because that's when most trauma happens. She used to call it *"trick time."* Those were the hours when she once suffered and, later, the hours when she chose to stand guard for others. At any given time, she mentored up to fourteen women. Some would reach out once a week, others every single day. And she never turned them away.

Katarina carried the weight of their stories—stories that mirrored her own. She absorbed their chaos, their fear, their shame, their exhaustion. That kind of giving comes at a cost. She admitted how retraumatizing it could be to hear horror stories that echoed her past, reliving the fear through the words of others. Her family saw the toll it took. But she didn't stop. She couldn't. She was driven by the conviction that no woman should have to walk through the dark alone.

When Katarina joined me at INSPYRD, she brought a lived understanding that textbooks can't teach. She reminded me that *helpers need healing too*. That's why together we created the *INSPYRD Angels* pilot initiative to support the frontline mentors, survivor-advocates, and peer supporters who give so much of themselves to others. This program exists because Katarina showed us what happens when empathy runs unprotected and how much stronger healing can be when neuroscience, structure, and community come together to support those who serve.

Katarina's story reminds us that trauma is not a life sentence—it's an injury that can heal. This initiative is dedicated to Katarina MacLeod: a warrior, mentor, and friend who proved that, even after unimaginable pain, a life of meaning and service is possible. Her light continues through every woman we help, every mentor we support, and every trauma we heal together.

Rising Angels Awareness and Restorative Care

This pilot initiative was generously funded by Rising Angels Awareness and Restorative Care (Rising Angels). It is a demonstration of their commitment to the women they serve and to improving the quality-of-care women who have survived human trafficking deserve.

Rising Angels is a survivor-led, trauma-informed Canadian registered charity.

They understand the impact that trauma caused by sexual exploitation has on a woman's life.

Rising Angels provides survivor support, trauma therapy, education to the public, training for professionals, and the ReBoot computer program for survivors.

Rising Angels helps by providing peer mentorship, life coaching and counseling for survivors, trauma informed therapy, spiritual guidance, crisis financial aid for survivors in their program, educational talks for schools and citizen groups, and training for service providers and front-line workers. Their ReBoot program is available to registered charities throughout Canada who are serving survivors.

Mission Statement

To bring education about commercial sexual exploitation to professionals and the public, and to provide supportive services and safe environments to women affected by commercial sexual exploitation, allowing them to experience physical, mental, social, and spiritual restoration in their lives.

Executive Summary

Human trafficking leaves deep neurological, emotional, and relational injuries that are often underserved by traditional mental-health systems. Survivor-led organizations like Rising Angels, are on the front lines, providing safety, community, and support—yet they consistently report gaps in interventions that are accessible, non-pathologizing, and tolerable for women who cannot safely revisit traumatic memories.

This pilot study was initiated by Rising Angels Awareness & Restorative Care as a practice-based evaluation to determine whether a neuroscience-informed coaching program could meaningfully improve outcomes for women already receiving services through their organization. The intent was to assess the validity, safety, and practical utility of integrating a structured coaching protocol into existing survivor support programming, with the goal of strengthening service delivery and improving quality of care. This is not a clinical trial and was never intended to be so.

The primary objective was to evaluate whether this coaching model demonstrated sufficient effectiveness, tolerability, and alignment with Rising Angels' survivor-centered values to justify broader integration into their service ecosystem.

Fourteen women participated; eleven completed the full protocol. Each received five structured coaching sessions emphasizing emotional safety, minimal disclosure, autonomic regulation, and Visual-Spatial Tasking (VST)-based reconsolidation strategies.

A mixed- methods design was used, incorporating an adapted Post Traumatic Stress Disorder Symptom Scale Interview (PSSI-5) and the Zimbardo Time Perspective Inventory (ZTPI) for quantitative assessments.

Outcomes were highly encouraging:

- 86.6% average reduction in PSSI-5 PTSD symptom severity
- 10 of 11 participants fell below the diagnostic threshold
- Significant shifts in ZTPI time orientation (↓ Past-Negative, ↑ Future)
- Improvements in sleep, emotional regulation, and non-triggerability

These findings suggest that a structured, neuroscience-informed coaching model may offer a safe, scalable, empowering complement to traditional trauma services. While preliminary, the results support further exploration through larger, controlled studies.

Keywords

Human trafficking, neuroscience, trauma-informed care, CPTSD, PTSD, coaching, NLP, visual-spatial tasking, trauma, trauma recovery,

Introduction

According to the International Labor Organization (ILO), human trafficking is one of the fastest-growing criminal enterprises globally, affecting tens of millions of people each year. The ILO estimates that over 27 million people are currently trapped in forced labour or sexual exploitation worldwide, with women and girls making up 71% of all detected trafficking victims (ILO, 2022).

In Canada, between 2012 and 2022, over 4,000 human trafficking cases were reported, with 93% of victims being female. Notably, 23% were under the age of 18, and 42% were between 18 and 24 years old, highlighting a disturbing trend of youth exploitation (Statistics Canada, 2023).

Gender Bias and Socioeconomic Vulnerabilities

Human trafficking is deeply gender biased. Young women from marginalized communities, especially those with histories of abuse, neglect, poverty, and systemic discrimination (including Indigenous and racialized populations) are disproportionately at risk. In fact, although Indigenous women and girls comprise only 4% of the Canadian population, they make up 50% of human trafficking survivors (Native Women's Association of Canada, 2018). Traffickers exploit vulnerabilities, grooming victims through coercion, deception, or force, often involving an intimate relationship. It is estimated that 91% of victims in Canada knew their trafficker, which speaks to the psychological complexity of these crimes (Public Safety Canada).

Traumatic Nature and Health Consequences

The trauma experienced by trafficked individuals is profound and cumulative. Survivors frequently show symptoms consistent with Complex PTSD, major depressive disorder, dissociation, and generalized anxiety.

Physical health issues include reproductive trauma, chronic pain, sleep disturbances, and malnutrition. The neurobiological impact of repeated trauma often results in disrupted autonomic nervous system function, leading to persistent hyperarousal or emotional shutdown. This trauma is also relational and societal. Survivors often struggle to reintegrate into community life. Relationships may be fraught with distrust, codependence, or avoidance. Substance use, often introduced or escalated during exploitation, becomes a

coping mechanism and barrier to stability. Without effective, accessible, and survivor-centered intervention, the cycle of dependency and re-traumatization continues.

Trauma Informed

A trauma-informed approach recognizes that trauma goes beyond a psychological experience and includes a neurobiological injury that shapes perception, behavior, emotional regulation, and relational safety. Trauma-informed practice prioritizes physical, emotional, and neurological safety; avoids re-traumatization; and emphasizes autonomy, choice, and empowerment rather than diagnosis or pathology. Rather than asking "Why are you struggling?" trauma-informed models ask, "How has what happened to you shaped your nervous system?" This approach acknowledges the pervasive impact of trauma on the autonomic nervous system, memory processing, and threat detection, and therefore adapts interventions to minimize exposure, reduce shame, and support regulation before meaning making. Within the context of this pilot initiative, trauma-informed care is operationalized through minimal disclosure, nervous-system regulation, survivor agency, and non-pathologizing, neuroscience-based coaching protocols designed to restore safety and functional capacity without requiring repeated retelling of traumatic experiences.

Neuroscience Based

A neuroscience-based approach grounds coaching protocol design and evaluation in established principles of brain function, neuroplasticity, memory processing, and autonomic nervous system regulation. Rather than relying solely on cognitive insight or narrative processing, neuroscience-based models target the neural mechanisms that underlie trauma symptoms—specifically dysregulation within limbic threat circuits, impaired prefrontal inhibition, disrupted memory reconsolidation, and persistent sympathetic nervous system activation. Coaching protocols are structured to work with how the brain encodes, retrieves, and updates experience, emphasizing bottom-up regulation, state change, and experiential tasking that engages sensory and visuospatial systems. In the context of this pilot, "neuroscience-based" refers to the intentional application of principles such as Hebbian learning, memory labilization and reconsolidation, visuospatial working-memory loading, and parasympathetic activation to reduce trauma symptomatology without requiring prolonged exposure or verbal reliving of traumatic events. This positions symptom reduction as the result of neural reorganization rather than cognitive reinterpretation alone.

Primary Objective

The objective of this pilot was to support Rising Angels in determining whether a trauma-informed, neuroscience-based coaching program could enhance the quality, effectiveness, and responsiveness of services provided to women recovering from human trafficking. Specifically, the pilot sought to assess whether the coaching intervention demonstrated sufficient benefit, safety, and client acceptability to be considered a valid adjunct to Rising Angels' existing survivor-led support model.

Rather than testing a hypothesis under controlled experimental conditions, this initiative functioned as a structured program validation and service-improvement assessment conducted within real-world service delivery. Psychometric and behavioral indicators were used to inform organizational decision-making about whether continued use or expansion of the coaching program was warranted to better meet the needs of clients served by Rising Angels.

Finally, this pilot may identify the potential for larger, follow-on, rigorous research to benefit the target population.

Collaborative Origins

This pilot initiative is a collaboration between Inspired Outcomes Corp (IO) (now INSPYRD Inc.) and Rising Angels, a Canadian non-profit organization dedicated to the rescue, restoration, and reintegration of women who have been trafficked. This pilot study was undertaken as part of Rising Angles ongoing commitment to evaluating and strengthening the services offered to survivors of human trafficking. As a survivor-led organization operating in complex and emotionally demanding frontline conditions, Rising Angels sought to determine whether a structured, neuroscience-informed coaching approach could improve client outcomes while remaining non-retraumatizing, accessible, and aligned with survivor agency.

The collaboration emerged after Rising Angels' Executive Director, Katarina MacLeod, personally experienced the coaching protocol and observed meaningful changes in regulation, functioning, and resilience. Based on these observations, Rising Angels engaged INSPYRD to conduct a pilot with existing clients to assess whether similar benefits might be realized more broadly and whether the intervention could responsibly enhance the organization's quality of service delivery.

Coaching to Ameliorate Symptoms

The core hypothesis of this observational initiative is clear:

> *"Can protocol-based coaching facilitate healing from trauma at a level sufficient to shift a client below the diagnostic criteria for PTSD?"*

Unlike traditional therapy, coaching does not rely on diagnosis or pathology. Instead, it is action-oriented, present-focused, and designed to support rapid, sustainable change through behavioural and neurological rewiring. Coaching respects the survivor's autonomy and resilience, meeting them as a whole person, not a patient.

Practice-Based Evidence

Practice-Based Evidence (PBE) is an outcomes-oriented framework that evaluates the effectiveness, feasibility, and safety of interventions as they are delivered in real-world service settings, rather than under tightly controlled experimental conditions. PBE emphasizes external validity, capturing how interventions perform with real clients, real practitioners, and real constraints.

This approach is particularly appropriate when working with complex, vulnerable populations for whom randomization, or repeated exposure may be impractical, unethical, or destabilizing. PBE focuses on observable change, client acceptability, practitioner fidelity, and functional outcomes that matter to service-delivery organizations.

Within this pilot initiative, a PBE framework was selected to assess whether a neuroscience informed, trauma focused coaching protocol could safely and meaningfully improve outcomes for survivors of human trafficking when embedded within a survivor-led organization's existing care environment. The use of PBE reflects an ethical commitment to evaluate impact without disrupting care, while generating actionable evidence to inform service quality, scalability, and future controlled research.

Survivors of trafficking often cannot access or tolerate clinical therapies requiring repeated retelling of traumatic memories. A PBE framework allows us to evaluate whether a neuroscience-informed, non-pathologizing coaching protocol can create meaningful change without requiring exposure-based processing.

This pilot is a survivor-centered, feasibility-focused evaluation to support Rising Angels' mandate to deliver the highest possible standard of care to survivors under their stewardship.

Background and Theoretical Framework

Neuro-Linguistic Programming (NLP) was created in the 1970s by Richard Bandler and John Grinder. The original intent was to model the excellence of therapists such as Milton Erickson and Virginia Satir. NLP proposes that by identifying and shifting internal representations (images, sounds, feelings), individuals can quickly transform their emotional responses and behavioural patterns. Bandler's early work, including *Frogs Into Princes*, inspired a wave of applications across education, performance, and mental health. Later refinements by Steve and Connirae Andreas brought a more structured, client-centered approach to NLP therapy and coaching. (Bandler & Grinder, 1975) (Andreas & Andreas, 1987)

While NLP's academic literature is constrained compared to mainstream psychology, applied evidence is growing. *The Research and Recognition Project*, led by Frank Bourke, proved that NLP-derived protocols reduced PTSD symptoms by up to 90% in U.S. military veterans. The intervention, known as RTM (Reconsolidation of Traumatic Memories), is being further evaluated by institutions such as Walter Reed Hospital (Uniformed Services University of Health Sciences) and Kings College, London. The author, formerly the Director of Training for *the Research and Recognition Project*, has adapted these principles into trauma-specific coaching and the overall protocol used. The result is a model uniquely suited to coaching clients with complex trauma as well as single-incident PTSD. (Bourke, Grey, & Hastings, 2012) (Grey & Bourke, 2015)

Alongside NLP, other novel, high-efficacy emerging modalities have shown promising results with trauma survivors including Emotional Freedom Techniques (EFT) or tapping, pioneered by Gary Craig and popularized by Nick Ortner, which combines somatic stimulation with cognitive reframing, in addition to Accelerated Resolution Therapy (ART), which integrates imagery rescripting and eye movements to rapidly reduce distress associated with traumatic memories. These approaches align with the core premise that trauma resolution occurs not through updating its neural and emotional encoding rather than retelling the story. (Craig, 2011) (Church et al., 2020) (Kip et al., 2012)

Neuroscience Based Trauma Coaching

Developmental and Memory Theories

Understanding trauma from a neuroscience perspective requires a developmental lens. William James and later Jean Piaget described how imprinting, modeling, and socialization shape early emotional responses. These early programs become deeply embedded in the nervous system.

Contemporary research, especially by Karim Nader, McGill University, shows that memories are not fixed. When recalled under the right conditions, memories become labile and can be reconsolidated with updated meaning. This insight forms the foundation of the tf-NLP reconsolidation strategies. (Nader et al., 2000) (Piaget, 1952) (James, 1890)

Hebb's Law and Neuroplasticity

Donald Hebb's principle of "neurons that fire together wire together" may partially explain how trauma patterns can be reinforced over time. Yet it also points to healing: by intentionally creating new, emotionally coherent neural patterns, we can rewire the brain for safety, connection, and possibility. (Kessler, 2016) (Hebb, 1949)

Autonomic Nervous System Regulation

Dr. Joe Dispenza's work has highlighted the importance of shifting from sympathetic (fight/flight/freeze) dominance into parasympathetic (rest and digest) states. Trauma coaching must start with nervous system safety. tf-NLP achieves this through peripheral vision exercises to downregulate visual focus stress; cyclic sighing, a technique to return the body to parasympathetic balance, validated by Dr. Andrew Huberman at Stanford University; and future pacing, which uses imagined positive outcomes to shift predictive emotion, aligning with Lisa Feldman-Barrett's theory that emotions are predictions, not reactions. (Dispenza, 2014) (Huberman, et al, 2023) (Lane et al., 2015)

Trauma-Focused NLP Coaching (tf-NLP)

The author developed the proprietary trauma-focused NLP coaching methodology and protocols used in this pilot (tf-NLP). It has evolved through an iterative, results-based method using client–coach experience to refine the protocol, enhance its efficacy and deliverability, regardless of the root cause of trauma. It is a structured, replicable, and scalable model of trauma-focused coaching that is evidence-based, behaviorally anchored, neuroscience-informed, and outcome-validated. The tf-NLP is uniquely suited for survivors of human trafficking. Developed over a decade, it is a structured, neuroscience-informed, NLP-based approach that addresses trauma at perceptual, emotional, and behavioural levels. Clients learn to regulate their nervous systems, reframe unhelpful narratives, and future pace adaptive outcomes. In doing so, they begin to embody post-traumatic growth. This pilot initiative marks a milestone in bringing tf-NLP into existing model of care and lays the foundation for larger-scale implementation, research, and evaluation.

Methods

Participants

A sample of fourteen Rising Angels' existing clients (participants), all of whom are adult survivors of human trafficking, were identified and agreed to participate.

Rising Angels is a local survivor-led, trauma-informed organization in Canada that provides peer mentorship, life coaching, counselling, trauma-informed therapy, spiritual guidance, and crisis financial aid to survivors of human trafficking and sexual exploitation. Inclusion criteria include:

- Self-identified survivor of human trafficking,
- Currently in a stable housing or rehabilitation environment,
- Able to provide informed consent,
- Not currently in acute psychological crisis or requiring hospitalization, and
- Receiving programs and services from Rising Angels organization.

Design

This pilot used a mixed-methods design, combining quantitative pre- and post-protocol measures with qualitative participant feedback to explore the feasibility and potential impact of a neuroscience-informed protocol delivered through weekly sessions for survivors of human trafficking. The pilot participants engaged in five 2-hour sessions delivered over a three-to-four-week period, facilitated by a certified NLP practitioner trained in tf-NLP trauma-informed care.

A total of fourteen women were initially enrolled in the pilot, of whom eleven completed the entire protocol. The ages of the participants ranged from 23 to 59 years, with a mean age of 39.2 years. After removing those who did not complete the protocol, the age range remained unchanged, while the mean age decreased to 37.2 years. At the end of the pilot, all eleven remaining participants were actively involved in post-trafficking recovery programs and services through Rising Angels. Of these, ten were employed, and one was classified as unemployed due to a long-term disability.

Participants were informed that the pilot was exploratory and that they could withdraw at any time without penalty.

Coaching Methodology

The tf-NLP protocol used in this pilot is grounded in neuroscience, NLP, and trauma-informed coaching principles. One of the core tenets of this protocol is

Emotional Safety. Clients are never asked to retell their trauma story. If emotional distress surfaces, the coach immediately activates parasympathetic regulation techniques (e.g., peripheral vision, cyclic sighing, break state) to restore a sense of safety.

Minimal Content

The protocol is designed so that memory activation rather than content sharing is the catalyst for change. This ensures reduced re-traumatization and greater client comfort.

Memory Consolidation and Reconsolidation

Contemporary neuroscience has demonstrated that memory is a dynamic, plastic process subject to modification across the lifespan rather than a static record.

Memory consolidation refers to the stabilization of newly encoded information into long-term memory through synaptic and systems-level processes, heavily influenced by sleep, emotional arousal, and hippocampal–neocortical interaction.

More recent research has established that, when consolidated memories are reactivated, they transiently enter a labile state in which they can be updated, weakened, or strengthened before being re-stored. This process is known as memory reconsolidation. This reconsolidation window provides a critical mechanism for therapeutic change, particularly in trauma recovery, as maladaptively encoded emotional memories can be modified without erasure.

Studies show that successful reconsolidation requires memory reactivation under conditions of safety and prediction error, allowing new emotional or contextual information to be integrated into the original memory trace. (Lane et al, 2015)

This body of knowledge has reshaped modern trauma interventions by shifting the focus from repeated exposure or narrative processing toward targeted memory reactivation followed by corrective neural experience, enabling durable symptom reduction through neurobiological updating rather than cognitive suppression or habituation alone. (Esley et al, 2017)

Ultradian Rhythms

Sessions are timed at 2 hours to align with natural cycles of neurological receptivity (Ultradian Cycles), as taught by Milton Erickson and explored in *Why We Sleep* by Matthew Walker. (Walker, 2017)

Each participant received five structured 2-hour coaching sessions over the course of three weeks. Breaks of 2–3 days between sessions were built in to support integration through sleep-based memory transfer (Walker, 2017).

Visual–Spatial Tasking

Tasks such as playing intense video games or completing pattern-based working memory engages the visuospatial component of working memory. This engagement limits the cognitive resources available for encoding or reconsolidating trauma-related visual imagery, thereby reducing the frequency of intrusive memories.

The visuospatial hypothesis suggests that when individuals perform Visual-Spatial Tasking (VST) during the memory labilization window, resources for sensory encoding are diverted, effectively disrupting the (re)consolidation of vivid, sensory-laden traumatic memories (Brewin et al., 1996; Iyadurai et al., 2018). This is supported by Dual Representation Theory, which states trauma related imagery stored as situationally accessible memories (SAMs) competes with verbal memory systems. VST preferentially loads the visuospatial system, reducing SAM reactivation in the form of flashbacks or intrusive imagery. (Iyadurai et al., 2018) (Brewin, Dalgleish, & Joseph, 1996)

A clinical intervention combining traumatic memory recall followed by Tetris® play demonstrated a decrease in intrusion frequency for that specific memory among PTSD patients, suggesting VST's potential benefits in real-world trauma settings (Kessler et al., 2020).

In controlled experiments using analog trauma (e.g., film clips), participants who engaged in visuospatial tasks during the labilization phase exhibited significantly fewer intrusive memories, though intensity and distress measures showed mixed results (Holmes et al., 2009).

Neurocognitive studies among veterans highlight that deficits in visuospatial working memory correlate significantly with PTSD re-experiencing symptoms, underscoring the importance of visuospatial processing in trauma pathology (Samuelson et al., 2022).

Early experimental work corroborated that playing Tetris® within a critical time window (e.g., 24 hours post-trauma analog) notably reduced flashbacks—participants reported 51% fewer intrusive episodes and lower PTSD symptom scores in subsequent days (Holmes et al., 2009).

All techniques within the tf-NLP framework have been reviewed for their inclusion of VST. The author has also reviewed publications regarding other

coaching, specifically trauma modalities, and has observed and anecdotally believes that the greater degree to which the technique employs VST the greater the amelioration of symptoms is.

Specific techniques such as the NLP trauma technique involving an imagined theatre setting achieves a >92% efficacy (Bourke et all, Kings College) in large part due to two key factors – the first being the specificity of the technique on a particular event and second the extreme level of visual-spatial tasking of the short-term working memory.

Quantitative Measurement

PTSD Symptom Scale Interview (PSSI-5)

From a neuroscience perspective, trauma refers to the persistent activation of stress-related neural circuitry long after an event has ended. This includes heightened responsivity in the amygdala, disrupted contextual processing in the hippocampus, and decreased regulatory influence from the medial prefrontal cortex. When these networks remain over-engaged, individuals experience intrusive memories, avoidance, mood changes, and hyperarousal—the core features of PTSD. To accurately measure the extent of this dysregulation, researchers and clinicians rely on structured, validated tools. One of the most respected instruments for assessing PTSD symptom severity under the DSM-5 is the PSSI-5 (Post-Traumatic Stress Disorder Symptom Scale Interview for DSM-5).

The PSSI-5 was developed by Dr. Edna B. Foa, a leading authority in trauma, anxiety, and emotional processing theory. Working with colleagues at the Center for the Treatment and Study of Anxiety at the University of Pennsylvania, Foa sought to create a measure that could reliably capture the subjective, often complex experience of post-traumatic stress. Earlier versions of the PTSD Symptom Scale and the Posttraumatic Diagnostic Scale, also developed by Foa's team, laid the groundwork. The PSSI-5 represents the updated version aligned with the revised diagnostic criteria introduced in the DSM-5, reflecting a more nuanced understanding of PTSD's symptom clusters.

The PSSI-5 is a structured interview consisting of 20 core items, each scored on a 0–4 Likert scale based on symptom frequency and severity over the past month. These items correspond directly to the four diagnostic clusters defined by the DSM-5:

- Intrusion: unwanted memories, flashbacks, nightmares.
- Avoidance: efforts to avoid trauma-related thoughts, feelings, or reminders.
- Negative alterations in cognition and mood: detachment, guilt, diminished interest, persistent negative beliefs.
- Arousal and reactivity: hypervigilance, exaggerated startle, irritability, sleep disturbance.

Scores range from 0–80, and numerous studies show that symptom severity measured by the PSSI-5 correlates strongly with neurophysiological markers of trauma, including elevated amygdala activation, reduced prefrontal regulation, and dysregulation of the hypothalamic-pituitary-adrenal axis. These correlations

strengthen the tool's neuroscientific credibility and its value determining the effect of the tf-NLP coaching protocol.

Interpretation guidelines for the PSSI-5 are well established:

- 0–9: no significant PTSD symptoms ("trauma-free").
- 10–23: mild or subthreshold symptoms ("traumatized but coping").
- >23: significant symptoms indicating probable PTSD.

For full DSM-5 diagnosis, an individual must also meet categorical symptom thresholds: at least one intrusion symptom, one avoidance symptom, two cognition/mood symptoms, and two arousal symptoms rated 2 or higher, along with evidence of functional impairment. The PSSI-5's structured format ensures clinicians evaluate each criterion consistently and sensitively.

The PSSI-5 is considered an extraordinarily strong and trustworthy assessment tool. Studies repeatedly show that it produces highly consistent results, scores remain stable over time, and different trained interviewers tend to arrive at the same conclusions when using it. It also aligns closely with the CAPS-5 (the primary interview used in PTSD diagnosis) while clearly distinguishing PTSD symptoms from issues like depression or general anxiety. Because of this level of reliability and clarity, the PSSI-5 is widely used in Veterans Affairs hospitals, university research programs, and clinical settings around the world.

In practice, the PSSI-5 provides a dependable way to assess how intensely the brain and body remain wired for survival. It also allows clinicians to measure treatment progress objectively: reductions in PSSI-5 scores often correspond with meaningful neural changes associated with recovery, such as improved prefrontal control, reduced limbic activation, and restored autonomic regulation. Whether used in cognitive therapy, Eye Movement Desensitization and Reprocessing (EMDR), somatic modalities, or VST interventions, the PSSI-5 offers a quantitative window into the healing process.

For pilot studies, clinical trials, or program evaluation, including the PSSI-5 ensures consistent assessment across participants, strengthens methodological reliability, and enhances the interpretive clarity of symptom change over time. The PSSI-5 stands as one of the most thoroughly researched and clinically trusted instruments for diagnosing and tracking PTSD under the DSM-5.

Zimbardo Time Perspective Inventory (ZTPI)

The Zimbardo Time Perspective Inventory (ZTPI), developed by Dr. Philip Zimbardo and Dr. John Boyd at Stanford University, is one of the most widely researched psychological frameworks for understanding how individuals mentally organize their experiences of the past, present, and future. Introduced in the late 1990s and formally presented in *Zimbardo & Boyd (1999)*, the ZTPI emerged from decades of research on human motivation, cognitive framing, and decision-making. Its core premise is that the way people relate to time profoundly shapes emotion, behavior, health, and resilience. This includes how they remember the past, experience the present, and anticipate the future.

Genesis and Theoretical Foundation

The ZTPI arose from Zimbardo's broader interest in situational psychology and temporal cognition (the psychological processes by which humans create narratives about time). Zimbardo observed that individuals differ systematically in how they weight past experiences, immediate sensations, and long-range consequences. These tendencies influence stress responses, coping strategies, self-regulation, and vulnerability to mental health challenges, including trauma. The ZTPI operationalized these insights into a measurable construct, creating the first comprehensive and empirically validated framework for "time perspective" as a stable psychological dimension.

The measure evaluates five primary orientations:

1. Past-Positive
2. Past-Negative
3. Present-Hedonistic
4. Present-Fatalistic
5. Future-Oriented

These dimensions form the basis of Zimbardo's seminal works, *The Time Paradox* and *The Time Cure*, which apply time perspective theory to wellbeing, trauma recovery, and behavior change.

Structure and Measurement

The ZTPI is a 56-item self-report inventory, with participants rating statements about memories, emotional tone, spontaneity, planning, and future goals. Scores across the five-time perspectives generate a psychological "temporal profile" that reflects how individuals distribute cognitive and emotional energy across different time frames.

A balanced temporal profile of high past-positive, moderate present-hedonistic, low past-negative and present-fatalistic, and strong future orientation is associated with resilience, psychological flexibility, and goal-directed behavior. Trauma, however, often distorts time perspective, especially by increasing past-negative orientation and diminishing future orientation, making the ZTPI particularly valuable in assessing the effect of the tf-NLP coaching protocol.

Psychometric Rigor and Stability

The ZTPI demonstrates strong psychometric properties, with internal consistency values typically ranging from .74 to .85 across subscales. Longitudinal studies show that time perspectives exhibit moderate-to-high test–retest stability, supporting the idea that temporal orientation is a relatively enduring cognitive-emotional style rather than a transient mood state.

Inter-factor correlations, confirmatory factor analyses, and structural equation modeling across multiple large samples have repeatedly validated the five-factor structure. These findings underscore the ZTPI's robustness as a psychological measure.

Cross-Cultural Validation in North America and Europe

One of the most significant strengths of the ZTPI is its extensive cross-cultural validation. Research teams across North America and Europe have replicated its factor structure and predictive reliability. These studies demonstrate that the ZTPI's conceptual foundations are culturally generalizable, making it one of the most internationally recognized temporal cognition instruments.

Across these countries, the ZTPI consistently predicts outcomes related to stress regulation, decision-making, academic achievement, risk-taking, and trauma-related symptoms.

Clinical and Research Applications

Because trauma often collapses a person's sense of time into a narrow "past-negative" frame or a fatalistic present, the ZTPI serves as a powerful tool for quantifying how trauma reshapes temporal cognition. It is widely used in clinical research, coaching, and therapeutic interventions including trauma-focused therapies, cognitive-behavioral approaches, and resilience-building programs.

Qualitative Behavioral Assessments

Subjective Units of Distress (SUDS)

The SUDS is a simple 0–10 (or 0–100) scale that allows individuals to quickly rate their current level of distress. Created by Joseph Wolpe, it remains a widely used tool in trauma therapy, somatic work, reconsolidation protocols, and coaching because it provides fast, intuitive insight into a person's internal state.

During trauma-focused coaching sessions, SUDS ratings are taken before, during, and after a technique/process to track emotional shifts. A decreasing SUDS score signals reduced emotional charge and helps identify whether deeper layers of unresolved experiences remain. Because it is easy to repeat and client-centered, the SUDS supports moment-to-moment attunement and ensures the work stays within a safe and regulated range.

Sleep Quality

Sleep quality is one of the most sensitive indicators of nervous system health. Trauma commonly disrupts sleep through hyperarousal, intrusive imagery, or difficulty settling the body, making self-reported sleep quality a valuable marker of recovery.

Tracking sleep helps clinicians and coaches see whether techniques are reducing autonomic stress and improving regulation. Improvements such as falling asleep faster, fewer awakenings, or waking more refreshed often align with decreases in hypervigilance and emotional reactivity. Even without formal sleep studies, subjective sleep ratings reliably predict stabilization, cognitive clarity, and resilience.

Sleep quality is captured as quantitative in the PSSI-5 assessment.

Daily Personal Assessment

The Daily Personal Assessment is adapted from Marshall Goldsmith's work on behavioral change, *Triggers* (2015). It invites individuals to rate their daily effort (rather than outcomes) in areas such as self-care, relationships, and career. Focusing on effort reduces self-judgment and builds consistent, values-aligned habits.

Using brief "Activity Cards," clients score the effort they applied to small daily commitments. Over time, these ratings reveal patterns, strengths, and areas needing support. For trauma recovery, this practice strengthens agency, intentionality, and executive functioning while keeping attention anchored in daily, manageable actions.

Trigger Response

"Non-triggerable" refers to being able to think or talk about a previously traumatic memory without experiencing emotional overwhelm, autonomic activation, or survival responses. It is assessed through a combination of client self-report and coach or clinician observation (breath, tone, posture, micro-expressions).

When a memory is no longer triggering, it has typically shifted into a coherent memory, fully stored in long-term declarative memory without inappropriate emotional charge. (Brewin et al, 1996) This shift occurs as specific coaching techniques decouple fear-based emotional networks from the memory itself. The brain reclassifies the event as *past*, allowing recall without reactivating stress circuitry.

Becoming non-triggerable is a strong indicator of trauma resolution and signals readiness for deeper integration and future-focused work.

Trigger response is captured indirectly and reported quantitatively in the PSSI-5 assessment.

Ethics and Program Evaluation

This pilot initiative involved a vulnerable population: women across Canada who have survived human trafficking. All participants were existing clients of Rising Angels, were already receiving services through the organization, and voluntarily elected to engage in the coaching program as an adjunct support option. The purpose of the evaluation was to assess service effectiveness and client benefit, not to conduct experimental research.

Given the vulnerability of the population, ethical priorities focused on informed consent, autonomy, non-coercion, emotional safety, and the right to withdraw without impact on access to services. Participation in the pilot had no bearing on eligibility for other Rising Angels programs, and all clients retained full access to existing support regardless of participation status.

All coaching sessions were conducted remotely via secure video conferencing, ensuring accessibility and privacy. Although the sample size was small, with a total of fourteen participants at the beginning of the pilot, it reflected real-world conditions. This allowed us to gather rich, individualized observations and insights while maintaining participant safety.

Of the fourteen participants, eleven completed both pre- and post-assessments, which were administered by an independent, accredited psychometric assessor based in Atlanta, Georgia, USA[1]. This assessor had no previous association with the clients or coaches, and there was no potential conflict of interest.

The complete ethical framework and program-evaluation rationale governing this pilot initiative are documented in Appendix 1- Ethics and Program Evaluation Framework.

[1] A total of 24 PSSI-5 assessments were completed. Due to availability and scheduling, 4 were conducted by the author.

Quantitative Findings

The goal was to measure symptom reduction as well as assess how the participants orient themselves toward the past, present, and future, all key indicators of trauma recovery.

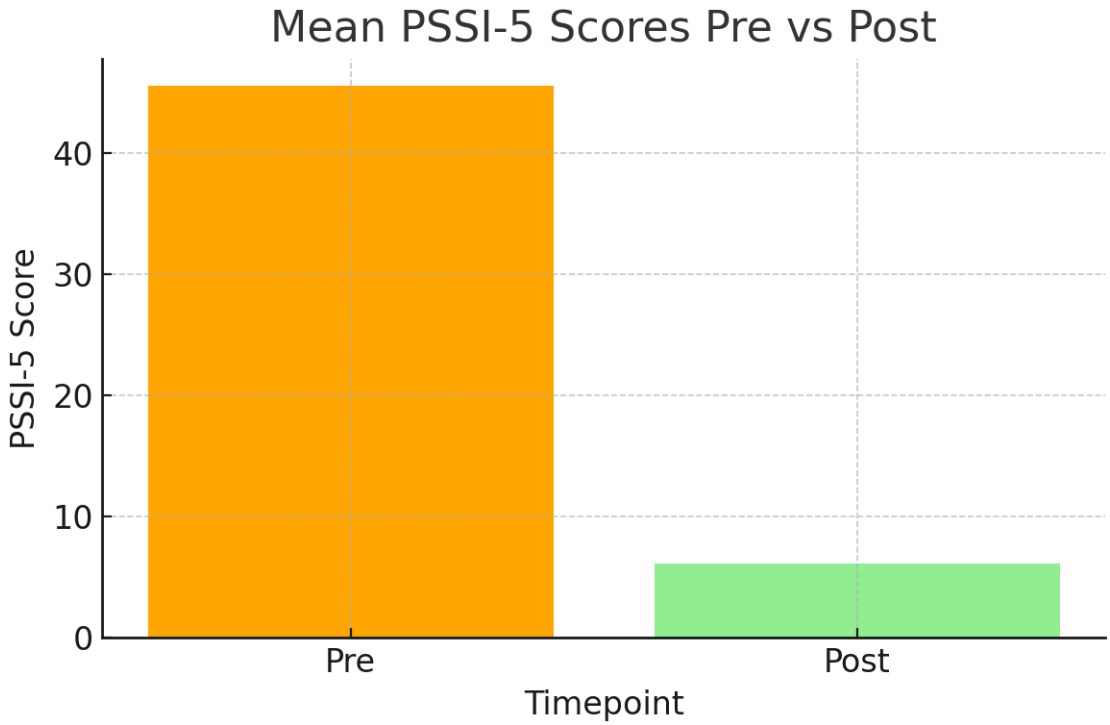
PTSD Symptom Scale Interview (PSSI-5)

Pre- and post-coaching protocol scores were recorded for the PSSI-5 and are shown in Table 1. PPSI-5 Scores Pre and Post Coaching Protocol, with the mean score of participants who completed the pilot shown in Graph 1. Mean PSSI-5 Pre and Post Intervention Score below.

#	ID	AGE	EMPLOYMENT STATUS	PSSI-5		PROGRAM STATUS
				PRE	POST	
1	10409	52	UNEMPLOYED	36.5	0.0	MED WITHDRAWL
2	10211	40	SOCIAL ASSISTANCE	35.7	0.0	WITHDRAWL
3	10310	48	SOCIAL ASSISTANCE	65.0	0.0	WITHDRAWL
	WITHDRAWALS	**46.7**		**45.7**		
1	10101	52	EMPLOYED	70.3	0.0	COMPLETE
2	10112	24	EMPLOYED	71.1	3.0	COMPLETE
3	10508	35	EMPLOYED - LTD	20.5	3.7	COMPLETE
4	10607	40	SOCIAL ASSISTANCE	48.2	46.3	COMPLETE
5	10706	59	EMPLOYED	52.8	7.3	COMPLETE
6	10805	33	SELF-EMPLOYED STUDENT	41.3	0.5	COMPLETE
7	10904	23	EMPLOYED STUDENT	38.2	0.0	COMPLETE
8	11003	27	EMPLOYED STUDENT	64.5	6.0	COMPLETE
9	11030	29	PT EMPLOYED & ODSP	56.0	0.0	COMPLETE
10	11102	37	EMPLOYED	23.7	0.0	COMPLETE
11	11201	50	EMPLOYED	14.2	0.5	COMPLETE
	ALL	**39.2**		**45.6**	**N/A**	
	COMPLETIONS	**37.2**		**45.5**	**6.1**	
SUCCESSFUL COMPLETIONS		**37.6**		**46.0**	**2.1**	

Table 1. PSSI-5 Pre and Post Coaching Protocol Scores

The PSSI-5 assessments were administered pre- and post- coaching protocol to assess change in PTSD symptom severity for participants who completed the full tf-NLP protocol. The PSSI-5 is a clinician-administered measure aligned with the DSM-5 criteria for PTSD and is widely used in trauma research because of its precision, reliability, and sensitivity to clinical change. In this pilot, complete pre–post data were available for 11 participants, enabling a quantitative evaluation of symptom reduction.



Graph 1. Mean PSSI-5 Pre and Post Coaching Protocol Scores

Pre- coaching protocol PSSI-5 scores showed a wide range of symptom severity, from moderate PTSD to severe and extreme symptom clusters. The mean baseline PSSI-5 score across the 11 participants was 45.5, with a standard deviation of 19.88, indicating a heterogeneous sample that included individuals experiencing acute autonomic dysregulation and chronic re-experiencing symptoms as well as participants who were functioning with more moderate trauma profiles. The large standard deviation demonstrates the diversity of trauma histories and coping states represented in the cohort.

Post- coaching protocol scores revealed a dramatic shift. The mean post-coaching protocol score fell to 6.1, with a standard deviation of 13.58. Importantly, the distribution of post-scores clustered at the very low end of the severity scale: four participants scored 0, two scored below 1, and only one participant remained above the diagnostic cutoff. In PSSI-5 scoring criteria, a score below 10 typically suggests minimal symptom presentation and is considered inconsistent with clinically impairing unresolved trauma. Ten of the eleven participants fell below this threshold following the coaching protocol.

The mean absolute reduction in PSSI-5 symptoms was 39.4 points. When expressed as proportional improvement, the average symptom reduction was 86.6%. This magnitude of change is rarely observed in short-term trauma

interventions and represents a powerful shift in core PTSD symptom domains: intrusion, avoidance, negative alterations in cognition and mood, and arousal/reactivity.

Individual Participant Trajectories

Six participants experienced a complete or near-complete resolution of symptoms (PSSI-5 score = 0 or close to 0).

Four participants registered mild residual symptoms (scores ranging from 3–7).

One participant, who began the coaching protocol with a comparatively mid level severity profile (Pre = 48.2), showed improvement but retained a moderate score at post tf-NLP protocol (Post = 46.3). This is the only case that did not exhibit meaningful change.

One participant with a high initial score (71.1) demonstrated a near-total symptom remission (Post = 3), representing a 95.8% reduction.

The consistency of response across severely symptomatic participants underscores the protocol's potential as a high-impact intervention.

The variability in baseline scores did not appear to predict outcome magnitude. Participants starting at low, moderate, and extremely high scores all showed dramatic reductions. This lack of correlation suggests that the tf-NLP protocol interacts with underlying neurobiological mechanisms of trauma rather than relying on the individual's functional capacity, verbal processing ability, or therapeutic history.

Examining the standard deviations pre- and post- coaching protocol reveals additional insights. The pre- coaching protocol standard deviation of 19.88 demonstrates wide variability in symptom load, whereas the post-coaching protocol standard deviation of 13.58 still showing some variability but reflects an overall "compression" of scores toward the low end. This pattern is characteristic of an effect strong enough to override initial severity differences.

Importantly, the post-coaching protocol data show floor effects, meaning most participants reached the lowest boundaries of the scale. Floor effects are rarely observed in PTSD research outside long-duration, exposure-based, or medication-supported programs. In this context, floor effects indicate that the tf-NLP protocol produced more than mere symptom decreases with near-elimination of intrusive, avoidant, and arousal-based symptom clusters for most participants.

The mean reduction of 39.4 points is extraordinary. In traditional PTSD treatment models:

- 12 to 20-point reductions are considered significant.
- 30+ point reductions are achieved only in highly effective modalities (e.g., prolonged exposure, EMDR).
- 40+ point reductions are extremely rare and typically occur only in extended multi-month therapeutic frameworks.

The fact that the participants achieved an average reduction approaching 40 points in a short duration intervention represents one of the strongest findings in this pilot.

Another quantitative indicator of transformation is the relationship between symptom reduction and functional improvement measures (sleep quality, SUDS, non-triggerability, ZTPI scores). Participants whose PSSI-5 scores dropped to near-zero also demonstrated improvements in sleep architecture, emotional regulation, future orientation, and autobiographical memory coherence. This cross-instrument consistency supports the interpretation that PSSI-5 reductions reflect genuine recovery rather than distortions such as avoidance, numbing, or response bias.

Finally, the coaching protocol completion rate among the trauma-affected participants was high. Only a small number withdrew, and, among those completing the protocol, 91% experienced meaningful improvement. This high protocol adherence further strengthens the quantitative findings, indicating the protocol is tolerable, safe, and acceptable to survivors of human trafficking—a population often unable to remain engaged in traditional talk-based trauma treatments.

In summary:

- Mean Pre = 45.5 → Mean Post = 6.1
- Mean Reduction = 39.4 points (86.6%)
- Six participants reached scores below 1
- Ten out of eleven fell below diagnostic threshold
- Symptom reduction consistent with improvements in all other measured domains

The quantitative data strongly support the conclusion that the tf-NLP protocol produced profound and rapid reductions in PTSD symptoms for most participants.

Zimbardo Time Perspective Inventory (ZTPI)

Pre- and post- coaching protocol scores on the Zimbardo Time Perspective Inventory (ZTPI) were analyzed for ten participants. The ZTPI is a validated

psychometric instrument developed by Philip Zimbardo and John Boyd to measure habitual temporal focus across five domains: Past-Negative, Past-Positive, Present-Hedonistic, Present-Fatalistic, and Future Orientation[1].

Changes in scores are shown in Table 2, with visual representations of Subscale Means shown in Graph 2 and in Graph 3 below. A 44% reduction was seen in the Past-Negative subscale scores, representing a substantial and meaningful shift in time perspective, showing a decreased tendency to ruminate on past regrets, failures, or traumatic experiences. Lower Past-Negative scores are strongly correlated with improved psychological well-being, including reduced symptoms of depression, anxiety, and stress. (Zimbardo & Boyd, 1999; Stolarski et al., 2014) (Zimbardo & Boyd, 1999)

Client #	PAST NEGATIVE		PAST POSITIVE		FATALISM		HEDONISM		FUTURE	
	ZTPI TARGET < 2.3		ZTPI TARGET > 3.5		ZTPI TARGET < 1.9		ZTPI TARGET > 3.9		ZTPI TARGET > 3.5	
	PRE SCORE	POST SCORE	PRE SCORE	POST SCORE	PRE SCORE	POST SCORE	PRE SCORE	POST SCORE	PRE SCORE	POST SCORE
COMPLETED										
10112	4.6	1.7	2.6	4.2	2.8	1.0	4.2	3.3	3.1	3.0
10508	2.5	2.4	3.1	3.6	2.6	2.2	3.1	3.5	2.9	2.6
10607	3.6	4.1	2.0	1.8	2.1	1.7	2.9	2.5	4.1	4.5
10706	3.6	2.5	3.0	3.6	2.1	1.9	3.3	3.5	3.4	4.7
10805	5.0	3.0	2.2	3.3	3.2	1.4	4.5	4.1	2.9	3.5
10904	4.8	2.1	2.2	3.1	3.7	2.3	3.8	4.2	3.4	4.8
11003	4.7	2.1	3.0	3.7	2.1	2.6	4.1	4.0	4.1	4.2
11030	5.0	1.8	2.3	5.0	3.2	1.0	4.2	3.4	2.5	3.8
11102	4.3	1.8	2.1	4.0	2.7	2.1	4.9	4.8	2.1	3.6
11201	2.7	1.6	1.1	2.3	2.2	2.4	2.6	2.7	4.2	4.6
Mean	4.1	2.3	2.3	3.5	2.8	1.9	3.7	3.6	3.1	3.9
INCOMPLETE										
10101	4.6	n/c	1.33	n/c	3.67	n/c	2.6	n/c	1.46	n/c
WITHDRAWLS										
10409	WD		WD		WD		WD		WD	
10211	WD		WD		WD		WD		WD	
10310	WD		WD		WD		WD		WD	

Table 2. ZTPI Pre and Post Coaching Protocol Scores

Group-Level Changes

At baseline, participants demonstrated the classic trauma-skewed temporal profile described in the literature. Mean Past-Negative scores were elevated (M = 4.1, standard deviation = 0.93), reflecting a cognitive-emotional pattern characterized by rumination, self-blame, and a threat-based interpretation of past events. Zimbardo identifies these tendencies as strongly correlated with anxiety, PTSD, and depression. Following the tf-NLP protocol, Past-Negative reduced to 2.3 (standard deviation = 0.76), a 43.9% decrease, approaching the *Balanced Time Perspective* range.

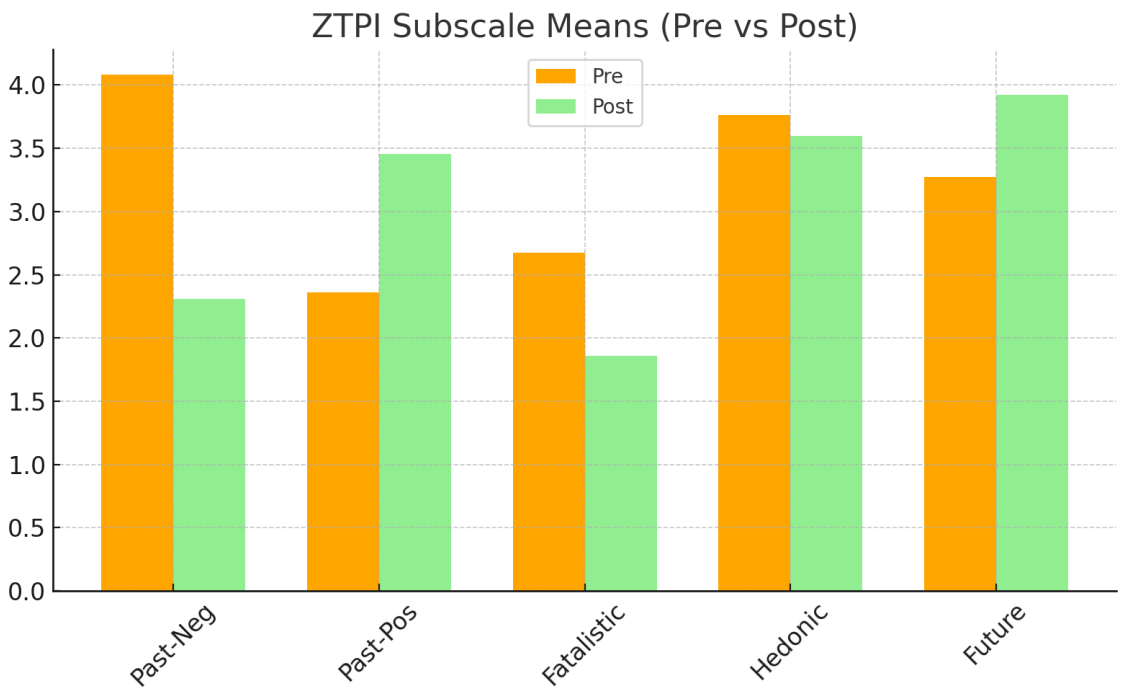
Past-Positive scores increased from 2.3 (standard deviation = 0.60) to 3.5 (standard deviation = 0.92) (+46.6%). This shift reflects participants' increasing ability to recall earlier life experiences with greater integration and less emotional distortion. According to Boniwell & Zimbardo (2004), growth in Past-Positive orientation is linked to resilience, stable identity, and psychological coherence.

Present-Fatalistic scores decreased from 2.8 (standard deviation = 0.56) to 1.9 (standard deviation = 0.57) (–30.5%), indicating a reduction in learned helplessness and resignation. Sword et al. (2014) emphasize that Present-Fatalistic orientation is one of the strongest time-perspective correlates of trauma exposure; reductions are therefore highly clinically meaningful.

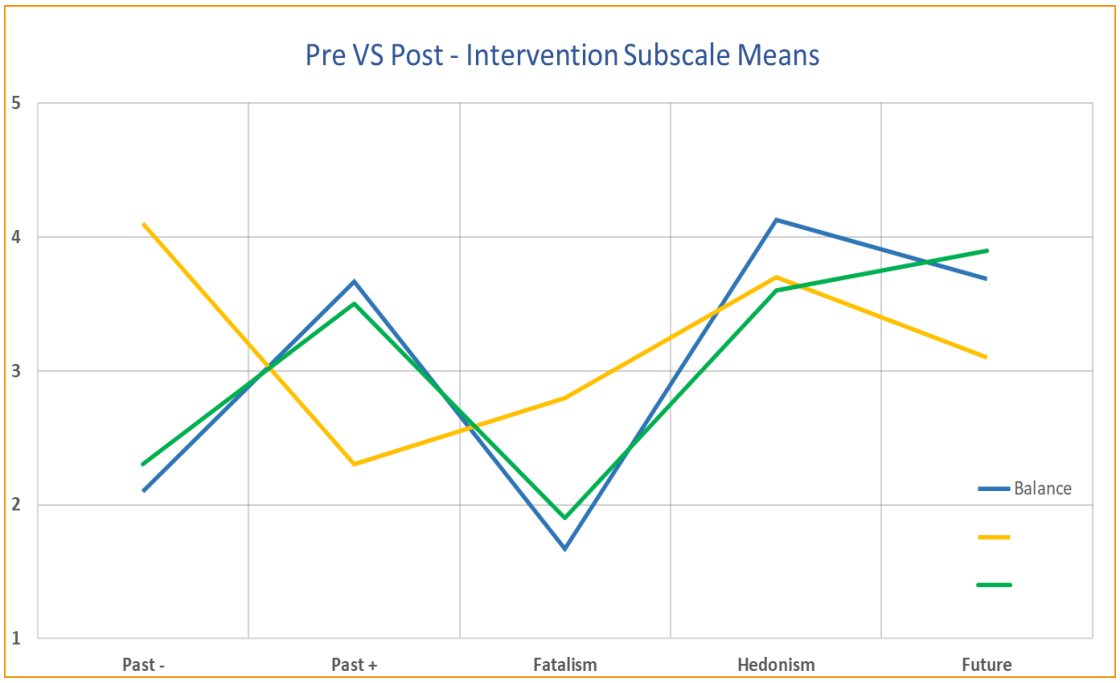
Present-Hedonistic scores shifted minimally (3.7 → 3.6), consistent with trauma literature suggesting that this domain is not typically a primary locus of post-traumatic change, nor a target during early-phase interventions.

Future Orientation increased from 3.1 (standard deviation = 0.70) to 3.9 (standard deviation = 0.75) (+20%). This places the group above the recommended threshold for adaptive future-focus, a key marker of post-traumatic growth. This indicates greater ability to imagine possibilities, plan, and delay immediate impulses in favor of long-term outcomes.

Together, these shifts resemble the "re-balancing" pattern described by Zimbardo, Boyd, and later researchers, in which reduction of Past-Negative and Present-Fatalistic tendencies enables the emergence of a healthier Past-Positive and Future-oriented profile.



Graph 2. ZTPI Pre versus Post-Coaching Protocol Subscale Means



Graph 3. ZTPI Pre versus Post-Coaching Protocol Subscale Means

Qualitative Findings

Although the pilot included observational notes on distress, sleep, daily functioning, and triggerability, these domains are already represented within the PSSI-5 items (e.g., avoidance behaviors, emotional and physical reactivity to reminders in items 7, 8, 10, and sleep disruption 23–25). Because the pilot did not conduct a separate structured qualitative analysis (such as coded interviews or systematic narrative review) the qualitative insights presented here should be considered supplementary practice-based observations. They provide contextual colour and help illustrate the lived experiences that accompanied the quantitative changes but are not intended to stand alone as independent qualitative evidence.

SUDS

SUDS ratings were collected before and after each technique within the protocol to monitor moment-to-moment changes in emotional distress. Although these values were not aggregated for statistical analysis, practitioner observation indicated that SUDS served as a reliable in-session indicator of regulatory shifts. Participants consistently demonstrated reductions in distress following individual coaching protocol steps, consistently moving from elevated baseline ratings to significantly lower post-technique scores. These changes were accompanied by visible improvements in affect, posture, and autonomic regulation. The use of SUDS throughout the protocol supported clinical decision-making, ensuring that each stage of the process was completed effectively.

Daily Personal Assessment

These ratings were not analyzed quantitatively. Practitioner observations and participant feedback indicated a clear upward trend in daily engagement over the course of the coaching protocol. Participants reported becoming more aware of their emotional states, more consistent with small self-care actions, and more intentional in relationships and goal-related behaviours. This daily tracking appeared to reinforce agency and self-monitoring, skills often disrupted by trauma. It also supported the sense of momentum participants described as their distress decreased. While not a formal qualitative dataset, these practice-based impressions suggest that the daily assessment process may contribute to improved regulation, stability, and personal accountability throughout the program, congruent with the work of Marshall Goldsmith.

Discussion

PSSI-5

The PSSI-5 results reveal a pattern of improvement that is both clinically significant and theoretically important. The magnitude, rapidity, and consistency of symptom reduction point to mechanisms of change that extend beyond traditional cognitive or exposure-based trauma interventions. To interpret these findings fully, it is necessary to consider trauma neurobiology, the known limitations of standard PTSD treatment, and the multi-dimensional improvements seen across the pilot's data ecosystem.

First, the 86.6% average symptom reduction suggests that the tf-NLP protocol is more than simply reducing symptom expression and rather fundamentally altering how traumatic memory networks are stored, accessed, and regulated. In classical PTSD theory, intrusive symptoms, avoidance, and hyperarousal result from "maladaptive over-consolidation" of traumatic memory in the amygdala and limbic structures, paired with weakened prefrontal inhibition. (Koenigs & Grafman, 2009) Traditional treatments often rely on repeated exposure to traumatic content to reorganize these circuits, however, exposure-based methods are known to have high dropout rates in trafficking survivors, who frequently cannot tolerate reliving traumatic events.

In contrast, the tf-NLP protocol does not rely on prolonged exposure or narrative processing. Instead, it appears to produce rapid reductions in limbic activation through visual-spatial tasking, bilateral working memory engagement, and neurological state shifts rooted in Hebbian plasticity. Participants who began with extreme symptom activation (scores above 70) demonstrating near-total remission strongly supports the hypothesis of a bottom-up neurobiological mechanism.

The fact that six participants reached a score of zero (or nearly zero) is particularly noteworthy. Zero scores on the PSSI-5 typically mean the participant is experiencing no intrusive memories, no avoidance, no negative mood/cognition disturbances, and no hyperarousal attributable to trauma. In the context of trafficking survivors, achieving this outcome within a short coaching protocol would traditionally be considered nearly impossible. These results challenge prevailing assumptions that trauma healing must be slow, linear, and cognitively heavy. Instead, the results indicate that, when the right neurological systems are targeted, the brain can reorganize traumatic memories with remarkable speed, particularly via VST-based coaching protocols.

The cross-domain coherence further strengthens the interpretation. Reductions in PSSI-5 scores correspond directly with:

- Decreased SUDS ratings.
- Emergence of non-triggerable memory recall.
- Improved sleep quality.
- Marked improvements in ZTPI temporal balance.
- Gains in emotional regulation.
- Reports of increased calm, clarity, and future planning capacity.

This pattern reflects a global shift in autonomic and cognitive functioning, consistent with the nervous system moving out of chronic sympathetic activation and into a regulated parasympathetic state. The PSSI-5 captures sleep data involving the ability to fall asleep, the number of wakeups due to unregulated emotions, and the total number of hours of sleep. It does not capture time perspective or emotional regulation directly, but the fact that improvements in these domains tightly track symptom reduction suggests that the protocol impacts the underlying neurophysiology that drives PTSD itself.

Another point of interpretation involves the single participant who showed minimal change. This case is vital in understanding the boundaries of the protocol. The participant started with moderately high symptoms at 48.2 on the scale and ended at 46.3, indicating resistance to change. This may reflect:

- A dissociative subtype of PTSD.
- A neurological or medical condition interfering with regulation.
- External stressors (housing insecurity, ongoing threat, legal processes).
- Neurochemical imbalances not easily shifted by psychological methods.

In trauma research, one resistant case among ten responding cases is not unusual. However, it underscores the need for a clinical escalation pathway, a structured decision process that guides when an individual who does not respond to a VST-based protocol should receive enhanced support, adjunctive modalities, or referral to higher-intensity care (Steenkamp et al., 2015). Importantly, the presence of a single non-responder strengthens the validity of the overall dataset, reducing the likelihood that the results can be attributed to systemic bias or expectancy effects.

Another interpretive layer involves understanding the floor effects observed in the post-coaching protocol data. Floor effects in PTSD research typically indicate either an extremely effective intervention or a methodological flaw. In this case, because the floor effects are supported by cross-instrument physiological improvements and by behavioral markers of recovery (calm affect,

improved concentration, reduced startle responses), they appear to reflect genuine neurobiological remission.

Moreover, the pattern of change challenges the assumption that survivors of trafficking require long-duration, resource-intensive clinical programs to recover. Instead, it supports a growing body of evidence that traumatic memory reconsolidation can be induced rapidly when specific neural networks are activated in the correct sequence.

Finally, the interpretation must acknowledge the broader implications. If replicated, these results would represent a major contribution to the field of trauma recovery. They suggest:

1. Trauma is treatable, and it is modifiable at the neurological level.
2. Healing does not require long-term exposure to traumatic content.
3. Survivors can achieve rapid relief without re-experiencing trauma stories.
4. A VST-based protocol may bypass the limitations of talk therapy, exposure therapy, and cognitive restructuring.
5. The protocol appears uniquely suited to survivors of coercive control, trafficking, and chronic relational trauma—populations underserved by conventional models.

In sum, the PSSI-5 results strongly suggest that the tf-NLP protocol triggered a structural reorganization of traumatic memory in most participants. This reorganization resulted in the collapse of intrusive symptoms, normalization of autonomic functioning, restoration of cognitive control, and emergence of future-oriented thinking. Taken together, the findings support the conclusion that the tf-NLP protocol appears to be trauma-resolving, more than simply symptom reducing.

ZTPI

The Zimbardo Time Perspective Inventory (ZTPI) outcomes in this pilot represent a profound reorganization of how participants relate to their past, their present, and their imagined future. Time perspective, as conceptualized by Zimbardo & Boyd, is a "semi-stable cognitive framework" through which experiences are encoded, evaluated, and projected across time. Trauma, particularly chronic trauma because of human trafficking, is known to collapse and distort these temporal frameworks, anchoring survivors in a maladaptive temporal loop dominated by Past-Negative and Present-Fatalistic orientations. What the current pilot demonstrates is a measurable release from these trauma-bound distortions and a movement toward what researchers describe as a Balanced Time Perspective (BTP): a psychological profile associated with resilience, emotional regulation, identity coherence, and life satisfaction.

The most clinically striking finding is the 43.9% reduction in Past-Negative orientation. Past-Negative represents a cognitive-emotional style characterized by rumination, guilt, hopelessness, and a belief that the past is permanently damaging. Sword et al. (2014) note that trauma survivors often respond to the Past-Negative frame with "frozen time," where the traumatic past becomes the organizing principle of present experience. In this initiative, mean Past-Negative scores dropped from 4.1 to 2.3, bringing the group nearly to the optimal zone identified in BTP models. This shift reflects more than cognitive reframing; it suggests that participants may have reorganized how traumatic memory is encoded in emotional and neural networks. This aligns directly with qualitative session notes (non-triggerability, coherent memory access) and supports the interpretation that memories once stored in a "trauma-coded" format have transitioned to long-term, coherent autobiographical memory through the tf-NLP coaching protocol.

Complementing this, the 46.6% increase in Past-Positive orientation demonstrates the emergence of a more integrated and compassionate autobiographical narrative. Boniwell & Zimbardo (2004) emphasize that Past-Positive is an essential resource in trauma recovery, as it stabilizes identity, strengthens continuity across life events, and enables individuals to access personal strengths from earlier periods of life. For many trafficking survivors whose pasts are dominated by harm, coercion, and exploitation, Past-Positive gains indicate a broader capacity to hold earlier memories within a more balanced narrative frame. In the pilot, participants' Past-Positive score rose to 3.5, just slightly below the target threshold (>3.5). This suggests participants began to recall parts of their history through a lens of growth, competence, and

survival, as opposed to one of threat and shame. The ability to hold multiple temporal truths simultaneously ("terrible things happened" and "I have strengths, resources, and meaningful relationships") is a hallmark of post-traumatic integration.

The reductions found in Present-Fatalistic scores are equally important. Present-Fatalistic thinking reflects a sense of powerlessness, resignation, and external locus of control, which are all cognitive patterns strongly correlated with PTSD severity. Trauma compresses time into an eternal present in which the individual cannot envision agency, alternatives, or future outcomes. In this pilot, Present-Fatalistic scores decreased by 30.5%, dropping to 1.9 and hitting the recommended threshold of 1.9 for adaptive functioning. This change aligns perfectly with Zimbardo's assertion that Present-Fatalistic orientation is "one of the most psychologically damaging time perspectives," eroding motivation and suppressing the capacity for change. The fact that participants shifted so significantly in this dimension suggests that the tf-NLP protocol may successfully restore the capacity for self-efficacy—a prerequisite for long-term behavioral recovery.

The small decrease in Present-Hedonistic orientation (–2.7%) is acceptable in this context. Present-Hedonistic, when in a normal range, is associated with vitality, spontaneity, and healthy engagement with the moment. In trauma-affected populations, this dimension is often either suppressed (due to hypervigilance) or becomes dysregulated (as a compensatory survival mechanism). The minimal change observed here supports an important point: the coaching protocol did not blunt participants' ability to enjoy or engage with life. Instead, it shifted the problematic dimensions (Past-Negative, Present-Fatalistic) while leaving adaptive present-moment orientation intact.

The 25.8% increase in Future Orientation is arguably the clearest signal of deep psychological change. Future orientation reflects the ability to envision possibilities, create goals, act toward long-term outcomes, and delay immediate impulses in service of those outcomes. For survivors of trafficking, who have lived long periods in survival mode, the forward extension of time is often collapsed. Numerous studies report that trauma constricts future cognition, producing a form of "temporal blindness" in which long-term planning is neurologically and emotionally inaccessible. The rise from 3.1 to 3.9 in this study moves the group above the BTP threshold (>3.5), indicating a meaningful recovery of long-range cognitive capacity.

This improvement is strongly aligned with Sword et al.'s Time Perspective Therapy research (2014), which demonstrated that reducing Past-Negative and

Present-Fatalistic orientations directly enables increases in Future orientation. In this respect, the ZTPI scores in this pilot show patterns consistent with established therapeutic models that explicitly focus on reorganizing time perspective to treat PTSD. However, the change in this pilot was achieved via the tf-NLP protocol, a visually mediated, neuroplasticity-based coaching protocol, rather than through traditional cognitive reframing or exposure techniques. The alignment of outcomes with the theoretical predictions of Time Perspective Therapy further strengthens the conclusion that temporal reorganization is a key mechanism of healing in this protocol.

From a systems perspective, what we see across all five temporal domains is symptom relief coming from the rebalancing of an individual's relationship with their past, present, and future, i.e., temporal reintegration. Zimbardo, Boyd, and Stolarski describe Balanced Time Perspective as the psychological "sweet spot" in which individuals can flexibly shift time perspectives in response to contextual needs. This flexibility supports resilience, cognitive agility, emotional stability, and wellbeing. In this pilot, participants moved significantly closer to this balanced configuration.

The congruence between ZTPI shifts, improvements in sleep, increases in stability, reductions in PSSI-5 symptoms, and the emergence of non-triggerable memory suggests that the tf-NLP protocol is producing changes in emotional reactivity and in the deeper cognitive architecture that organizes lived experience. Trauma is, fundamentally, a temporal injury. It distorts how individuals feel and when they feel. The temporal recalibration observed here suggests that participants are no longer living in trauma time, where the past hijacks the present and blocks the future, and are recovering the capacity to live across time in an integrated, coherent, and forward-moving way.

In addition to psychometric assessments, behavioural evidence of change was clear through an examination of SUDS, sleep quality, daily personal assessments, coach observation, and client self-reports. Participants reported meaningful shifts in behaviour and well-being, including improved sleep, aligning with Matthew Walker's findings on the role of deep sleep in emotional regulation; sustained employment or vocational engagement; stability in relationships, often the last domain to reflect trauma healing; and non-triggerable responses. Participants could reflect on past experiences without being emotionally hijacked. These outcomes support the possibility that trauma-focused coaching, when grounded in neuroscience, may offer a faster, more accessible, and empowering path to recovery. (Walker, 2017)

Limitations

This pilot explored the use of a neuroscience-informed tf-NLP protocol as a supportive psychological coaching protocol for survivors of human trafficking. Preliminary results suggest that tf-NLP coaching protocol may offer a feasible and acceptable approach to improving clients' ability to function as they experience fewer or no emotional triggers, drastically improved sleep patterns, medication reduction, significantly lower levels of physical pain, and improved productivity and optimism over most areas of their lives.

Participant feedback showed an important level of engagement and perceived personal benefit, particularly from techniques that enabled emotional regulation of a consistent and repeatable level.

The following contextual limitations should be noted:

- Small sample size limits generalizability.
- No control group, preventing causal attribution.
- Practice-based, not randomized, design.
- Because an experienced practitioner delivered the coaching protocol, future research may benefit from independent replication to evaluate practitioner fidelity and generalizability.
- Self-report measures may be influenced by subjective or motivational bias.
- Short-term measurement only, with long-term durability unknown.
- Potential heterogeneous trauma histories, limiting interpretation of subgroup differences.

Future Directions

Research

Given the promising results and positive participant feedback, a larger-scale, controlled research study is warranted. Future research should consider:

- Larger samples across multiple survivor-led organizations
- Randomized or waitlist-control designs
- Independent practitioner delivery
- 3-, 6-, and 12-month follow-up assessments
- Comparison with evidence-based therapies such as EMDR or CBT
- Qualitative interviews exploring survivor experience
- Fidelity and scalability evaluations for frontline staff and peer mentors

This pilot provides a strong foundation for expanded research.

Service Delivery

The positive participant response and the safe implementation of the tf-NLP protocol in this pilot suggest that the neuroscience-informed coaching protocol may hold meaningful value when integrated into broader trauma-informed care frameworks. Future work should explore the feasibility of implementing this model within residential programs, transitional housing environments, and survivor mentoring or reintegration services. Earlier intervention soon after a survivor's exit from trafficking may accelerate stabilization by reducing acute trauma symptoms and supporting the restoration of core capacities such as emotional regulation, interpersonal functioning, educational engagement, and vocational readiness. Systematic evaluation of this protocol in diverse service-delivery settings may help determine its effectiveness, scalability, and role within multidisciplinary recovery pathways.

Coaching

Integrating coaching-based protocols with client-administered psychometric assessments and real-time, session-level calibration tools such as SUDS may represent a promising direction for enhancing the precision and effectiveness of trauma-focused work. The outcomes of this pilot indicate that such multimodal, feedback-informed approaches can support substantial symptom reduction even within populations characterized by severe and chronic trauma histories, including survivors of human trafficking. Further empirical investigation is warranted to determine whether this model can reliably augment treatment responsiveness, improve individual tailoring of interventions, and facilitate early identification of therapeutic gains or plateaus. If validated, this approach may offer a scalable and cost-efficient framework for expanding access to trauma-recovery services in community and non-clinical settings.

References

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Washington, DC: Author.

Andreas, S., & Andreas, C. (1987). *Change your mind—and keep the change: Advanced NLP submodalities interventions*. Real People Press. (Andreas & Andreas, 1987)

Ayyadurai, L., Blackwell, S. E., Meiser-Stedman, R., Watson, P. C., Bonsall, M. B., Geddes, J. R., ... & Holmes, E. A. (2018). Preventing intrusive memories after trauma via a brief intervention involving Tetris computer game play in the emergency department: A proof-of-concept randomized controlled trial. *Molecular Psychiatry, 23*(3), 674–682. https://doi.org/10.1038/mp.2017.23 (Holmes et al., 2009) (Iyadurai et al., 2018)

Bandler, R., & Grinder, J. (1975). *The structure of magic I: A book about language and therapy*. Science and Behavior Books. (Bandler & Grinder, 1975)

Bourke, F., Grey, R., & Hastings, R. (2012). The Reconsolidation of Traumatic Memories (RTM) protocol: An experimental therapy for PTSD. *Journal of Military, Veteran and Family Health, 3*(2), 63–70. (Grey & Bourke, 2015)

Brewin, C. R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of posttraumatic stress disorder. *Psychological Review, 103*(4), 670–686. https://doi.org/10.1037/0033-295X.103.4.670 (Brewin, Dalgleish, & Joseph, 1996)

Church, D., Stapleton, P., Kip, A., & Gallo, F. (2020). Is tapping on acupuncture points an active ingredient in emotional freedom techniques (EFT)? A review and meta-analysis of comparative studies. *Journal of Evidence-Based Integrative Medicine, 25*. https://doi.org/10.1177/2515690X20910336

Craig, G. (2011). *The EFT manual*. Energy Psychology Press.

Dispenza, J. (2014). *You are the placebo: Making your mind matter*. Hay House.

Elsey, J. W. B., & Kindt, M. (2017). Breaking boundaries: Optimizing reconsolidation-based interventions for strong and old memories. *Learning & Memory, 24*(9), 472–479. https://doi.org/10.1101/lm.044156.116 (Esley et al, 2017)

Foa, E. B., McLean, C. P., Zang, Y., Zhong, J., Rauch, S., Porter, K., Knowles, K., Powers, M. B., Kauffman, B. Y., Rosenfield, D., & Zandberg, L. J. (2016).

Psychometric properties of the Posttraumatic Stress Disorder Symptom Scale Interview for DSM-5 (PSSI-5). Psychological Assessment, 28(10), 1159–1165. https://doi.org/10.1037/pas0000259

Goldsmith, M. (2015). *Triggers: Creating behavior that lasts—becoming the person you want to be*. Crown Business. (Goldsmith, 2015)

Hebb, D. O. (1949). *The organization of behavior: A neuropsychological theory*. Wiley. (Hebb, 1949)

Holmes, E. A., James, E. L., Coode-Bate, T., & Deeprose, C. (2009). Can playing the computer game 'Tetris' reduce the build-up of flashbacks for trauma? A proposal from cognitive science. *PLoS ONE, 4*(1), e4153. https://doi.org/10.1371/journal.pone.0004153 (Holmes et al., 2009)

Huberman, A. D., Spiegel, D., & Ferris, H. A. (2023). Physiological sighing improves affective state and reduces anxiety. Stanford University News Center, https://med.stanford.edu/news/insights/2023/02/cyclic-sighing-can-help-breathe-away-anxiety.html (Huberman et al, 2023)

James, W. (1890). *The principles of psychology*. Holt.

Kessler, D. A., (2016) Capture: Unravelling the Mystery of Mental Suffering, HarperCollins Publisher (Kessler 2016)

Kessler, H., Holmes, E. A., Blackwell, S. E., Schmidt, A. C., Schweer, J. M., & Bücker, A. (2020). Reducing intrusive memories of trauma using a visuospatial interference intervention with inpatients with posttraumatic stress disorder (PTSD). *Journal of Consulting and Clinical Psychology, 88*(11), 982–993. https://doi.org/10.1037/ccp0000601 (Holmes et al., 2009) (Kessler et al., 2020)

Kip, K. E., Elk, C. A., Sullivan, K. L., Lengacher, C. A., Long, C. J., Shuman, A., Hernandez, D. F., & Diamond, D. M. (2012). Brief treatment of symptoms of post-traumatic stress disorder (PTSD) by use of Accelerated Resolution Therapy (ART). *Behavioral Sciences, 2*(2), 115–134. https://doi.org/10.3390/bs2020115 (Kip et al., 2012)

Koenigs, M., & Grafman, J. (2009). Post-traumatic stress disorder: The role of medial prefrontal cortex and amygdala dysfunction. *Neuroscientist*, 15(5), 540–553. https://doi.org/10.1177/1073858409333072

Lane, R. D., Ryan, L., Nadel, L., & Greenberg, L. (2015). Memory reconsolidation, emotional arousal, and the process of change in psychotherapy: New insights from brain science. *Behavioral and Brain

Sciences, 38*, e1. https://doi.org/10.1017/S0140525X14000041 (Lane et al, 2015)

Nader, K., Schafe, G. E., & LeDoux, J. E. (2000). Fear memories require protein synthesis in the amygdala for reconsolidation after retrieval. *Nature, 406*(6797), 722–726. https://doi.org/10.1038/35021052

Piaget, J. (1952). *The origins of intelligence in children*. International Universities Press. (Piaget, 1952)

Porges, S. W. (2011). *The polyvagal theory: Neurophysiological foundations of emotions, attachment, communication, and self-regulation*. Norton. (Porges, 2011)

Samuelson, K. W., Krueger, C. E., Burnett, C., Wilson, C. K., & Henn-Haase, C. (2022). The role of visuospatial working memory in posttraumatic stress disorder symptoms: Evidence from a veteran sample. *Journal of Anxiety Disorders, 86*, 102516. https://doi.org/10.1016/j.janxdis.2021.102516 (Samuelson et al., 2022)

Steenkamp, M. M., Litz, B. T., Hoge, C. W., & Marmar, C. R. (2015). Psychotherapy for military-related PTSD: A review of randomized clinical trials. *JAMA, 314*(5), 489–500. https://doi.org/10.1001/jama.2015.8370

Walker, M. (2017). *Why we sleep: Unlocking the power of sleep and dreams*. Scribner.

Weathers, F. W., Bovin, M. J., Lee, D. J., Sloan, D. M., Schnurr, P. P., Kaloupek, D. G., Keane, T. M., & Marx, B. P. (2018). *The Clinician-Administered PTSD Scale for DSM-5 (CAPS-5): Development and initial psychometric evaluation in military veterans.* Psychological Assessment, 30(3), 383–395. https://doi.org/10.1037/pas0000486

Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology, 77*(6), 1271–1288. https://doi.org/10.1037/0022-3514.77.6.1271 (Zimbardo & Boyd, 1999)

Zimbardo, P. G., & Boyd, J. N. (2008). *The time paradox: The new psychology of time that will change your life*. Free Press. (Zimbardo & Boyd, 1999)

Appendix 1- Ethics & Program Evaluation Framework

Purpose of the Initiative

The INSPYRD Angels Pilot Initiative was conducted as a service-evaluation and quality-improvement initiative involving existing clients of Rising Angels Awareness & Restorative Care. It does not constitute a clinical trial or academic research study and was undertaken to inform internal program development and service delivery decisions.

Rising Angels engaged this pilot to determine whether a neuroscience-informed coaching program demonstrated sufficient effectiveness, safety, and client benefit to justify consideration for broader integration into existing survivor support services. The primary goal was to inform organizational decision-making regarding service enhancement and quality of care for women already receiving support through Rising Angels.

Nature of the Activity

This initiative constitutes a practice-based service evaluation, conducted within real-world service delivery conditions, involving existing clients who voluntarily elected to participate.

Key characteristics include:

- Participants were already enrolled clients of Rising Angels
- Participation was optional and non-coercive
- Services were delivered as an adjunct support, not as an experimental treatment
- The intent was internal learning and service improvement
- No randomization, control groups, or experimental manipulation were used
- No diagnostic or medical claims were made

As such, the pilot aligns with established distinctions between program evaluation towards quality improvement and human-subjects research as defined under Canadian ethical guidance frameworks.

Ethical Framework Applied

Although formal Research Ethics Board (REB) review was not required for this type of program evaluation, Rising Angels applied a trauma-informed ethical framework appropriate for work with a vulnerable population.

Ethical safeguards included:

- Informed, voluntary consent

- Clear communication that participation would not affect access to services
- Right to withdraw at any time without penalty
- Emphasis on emotional safety and minimal disclosure
- Non-pathologizing, non-diagnostic coaching approach
- Secure and confidential handling of participant information

The pilot design prioritized participant autonomy, dignity, and safety over data collection imperatives.

Use of Outcome Measures

Standardized psychometric tools were used solely to support service evaluation and internal decision-making. Measures were selected to help Rising Angels assess whether the coaching program:

- Reduced trauma-related distress
- Improved functional indicators such as sleep and emotional regulation
- Was tolerable and acceptable to participants

The use of outcome measures does not constitute research but rather reflects best practice in evidence-informed service delivery and continuous quality improvement.

Intended Use of Findings

The findings of this pilot are intended to:

- Inform Rising Angels' internal program decisions
- Support responsible service innovation
- Guide future service development and refinement
- Contribute to transparency with funders and partners

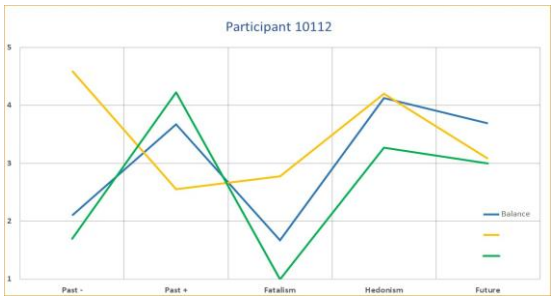
While results may be shared descriptively for educational or advocacy purposes, they are explicitly presented as preliminary, practice-based findings, not as generalizable evidence.

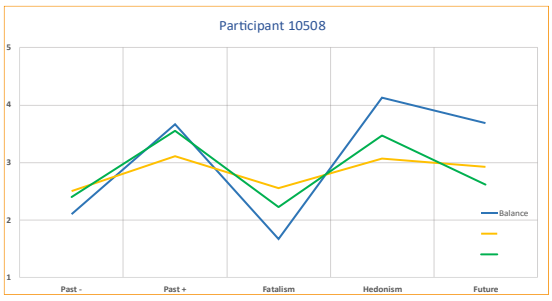
Conclusion

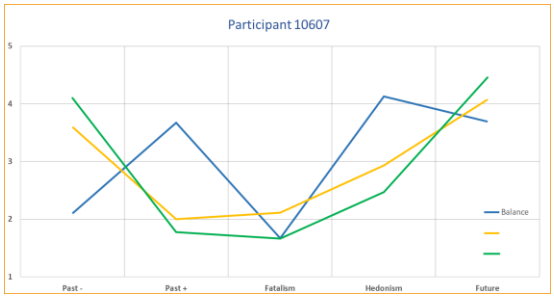
The INSPYRD Angels Pilot Initiative represents a responsible, ethically grounded effort by a survivor-led organization to evaluate whether a novel coaching intervention could meaningfully enhance the quality of care provided to its clients.

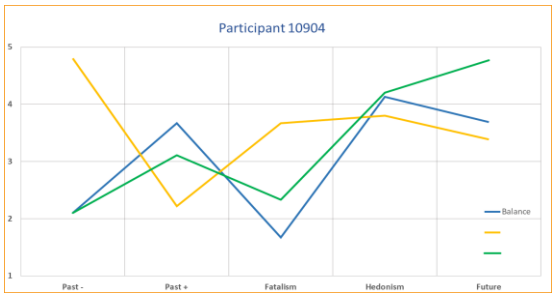
The pilot was conducted within appropriate ethical boundaries for program evaluation, with safeguards consistent with trauma-informed practice and organizational governance standards.

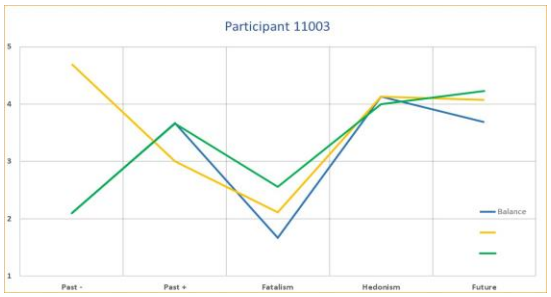
Appendix 2 – Participant ZTPI Comparison Graphs

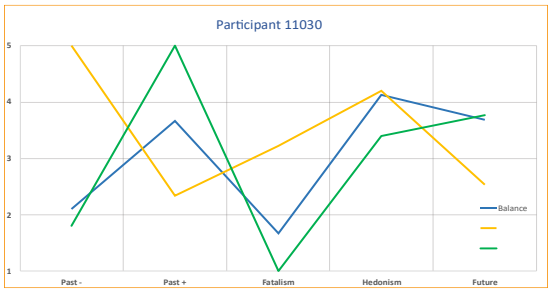


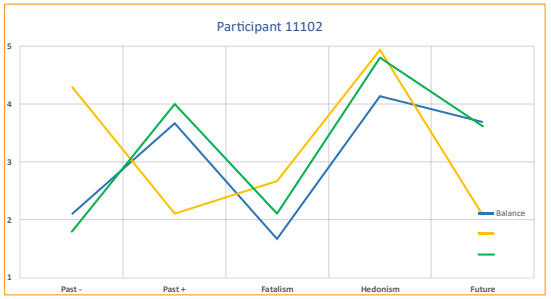


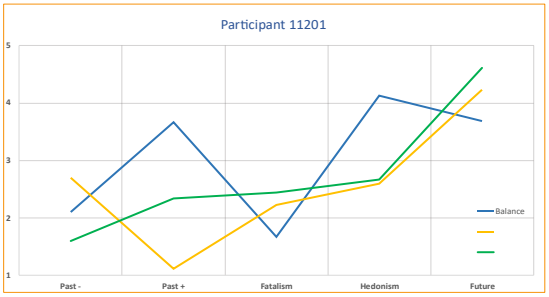












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