

Flash Technique: A Non-Trauma-Exposing Intervention Method for Post-Traumatic Stress Response - Postprint

Authors: Yan Yaqin, Ling Hui, Huang Xilin

Date: 2023-10-09T00:00:00+00:00

Abstract

Flash Technique (FT) is a minimally invasive, cost-effective, rapid, and highly tolerable psychotherapeutic approach for treating non-organic psychological problems, with a therapeutic focus on processing traumatic memories within the brain's information processing system without requiring trauma exposure. In clinical applications, FT can both process traumatic memories and experiences, alleviate clients' subjective distress, and help clients achieve healthier psychological states. However, current research on FT remains limited in scope and exhibits deficiencies in sampling and methodology. Future research should employ diverse measurement methods and research approaches—including fMRI, ERP, and eye-tracking technology—to further investigate its underlying mechanisms; validate the clinical efficacy of FT interventions within Chinese cultural contexts through more rigorous research designs and extended follow-up periods; thoroughly explore its application domains; and develop standardized, generalizable intervention protocols.

Full Text

Flash Technique: A Non-Trauma-Exposure Intervention for Post-Traumatic Stress Responses

2. Background and Foundation of Flash Technique

2.2 Proposal of Flash Technique As an effective treatment method, Eye Movement Desensitization and Reprocessing (EMDR) demonstrates strong specificity and practicality. However, in the standard EMDR protocol, clients must expose traumatic memories and retrieve traumatic details, and progress often stalls when clients avoid fully accessing traumatic memories during treatment (Manfield et al., 2017). Yet, does this conscious, emotionally charged trauma exposure cause harm to clients? Clinical practice reveals that some

clients experience emotional fluctuations, excessive tension, or self-isolation, and may even exhibit dissociative symptoms or emotional collapse when contacting traumatic memories, making EMDR processing difficult (Shapiro, 2014). To address overwhelming trauma, EMDR therapy has developed several techniques to assist clients who refuse to confront trauma-related fears, cannot tolerate systematic exposure, or fail to benefit from it (Manfield, 2013). The Flash Technique (FT) is among these innovations.

Initially, FT served as a rapid and relatively painless method to reduce the intensity of interfering memories, used as a preparation phase for EMDR so that these memories could be more easily processed during the remaining stages of standard EMDR therapy. This was particularly valuable for clients who were highly anxious about accessing traumatic memories, experienced dissociation or emotional dysregulation during trauma exposure, or refused to access memories altogether. The goal of FT intervention was to reduce interference related to the target memory without pain, to the point where clients no longer resisted processing with standard EMDR. Simultaneously, FT could function as an adjunctive intervention, accelerating the effectiveness and improving the tolerability of various trauma-related psychotherapies based on exposure techniques. In Internal Family Systems therapy, FT could be used to “unburden” parts, while in Cognitive Behavioral Therapy (CBT), it could enhance clients’ acceptance of corrective perspectives (Manfield, 2020).

Meanwhile, researchers discovered that many clients’ Subjective Units of Disturbance (SUD; Wolpe, 1958) could decrease to 0 even without using the standard EMDR protocol, suggesting that FT might function as an independent therapy (Manfield et al., 2017). Subsequently, an increasing number of researchers confirmed that FT, as a standalone therapy, could rapidly and effectively reduce the emotionality and vividness of traumatic memories, decrease their interference level, and improve trauma-related stress symptoms (Brouwers et al., 2021; Manfield et al., 2017; Manfield et al., 2021; Yasar et al., 2021).

2.3 Application of Flash Technique As FT has evolved into an independent therapy, many psychotherapists in the United States, Turkey, the Netherlands, Australia, and other countries have implemented it in clinical practice, conducting a series of interventions for various populations including PTSD patients, personality disorder patients, and clients with traumatic experiences, and publishing related papers (Brouwers et al., 2021; Shebini, 2019). In China, relevant institutions are actively promoting FT research and clinical practice.

3. Flash Technique Intervention Protocol and Effects

3.1 Flash Technique Intervention Protocol As an emerging therapy, FT procedures and protocols continue to be adjusted and updated. To date, a relatively unified treatment process includes: First, history taking. Establishing the therapeutic relationship, collecting history, and developing treatment planning and case conceptualization. Second, preparation. Helping clients find a

safe or calm place and attempting to relax. Clients are asked to focus on positive memories that make them feel safe and comfortable; if none can be found, they may focus on relaxing and comfortable images, music, or figures. Third, assessment. Selecting the traumatic memory to be processed, requiring clients not to recall details of the memory or inform the therapist of its content, and assessing the Subjective Units of Disturbance when contacting the memory as quickly as possible. The SUD scale ranges from 0 (no discomfort) to 10 (extreme discomfort). Fourth, desensitization. Clients are asked to avoid contacting the traumatic memory as much as possible. This “non-contact” can be achieved by directly instructing clients “not to recall details of the traumatic memory” or by asking them to imagine placing the memory in a book/box, closing it, and only briefly viewing the cover/lid in their mind. Subsequently, under the therapist’s guidance, bilateral stimulation (BLS) begins (such as alternately tapping legs or butterfly hugging) while focusing on positive memories or images. The therapist may discuss details of these memories or images with the client, intermittently saying “flash” during conversation and asking the client to quickly blink 3-5 times when hearing this word (Wong, 2018). After six sets of “flash” procedures, clients briefly contact the traumatic memory to assess current SUD level. The same procedure repeats until SUD and uncomfortable physical/emotional reactions successfully diminish. Fifth, closure. The therapist and client briefly discuss treatment effects, using stabilization techniques if necessary to ensure the client’s stability and current adaptive state. Sixth, reevaluation. Assessing SUD scores before and after intervention to determine whether further treatment is recommended. Through this process, clients typically experience the traumatic memory becoming more distant and the book/box containing it fading, with memories growing increasingly vague, colors gradually disappearing, and pain from contacting the memory significantly reduced, leading to relatively stable and pleasant emotions.

The most distinctive feature of the FT protocol is its minimal trauma exposure. Therapists do not inquire about trauma-related details and simultaneously require clients to “avoid contact” with traumatic memories, which differs from most mainstream trauma-related therapies. Therefore, whether FT is effective and its mechanism of action warrant further exploration and verification.

3.2 Flash Technique Intervention Effects When intervening in post-traumatic stress responses and related disorders, FT is an easy-to-operate, rapid, effective, economical, and painless method. FT’s therapeutic effects can be achieved in each session without additional homework, allowing for continuous intensive intervention, which is particularly beneficial for highly distressed clients as it can alleviate their suffering as quickly as possible. For example, Manfield et al. (2017) intervened with a 35-year-old male client who had suffered spinal injuries in a car accident and undergone multiple surgeries, subsequently seeking psychological treatment during physical therapy. He met PTSD diagnostic criteria with a self-reported SUD score of 12 (out of 10), exhibiting dissociative symptoms. After two FT sessions, his SUD score

decreased to 0. After two additional sessions, the client reported stable condition, feeling that trauma memories related to the accident were gradually becoming distant and faded, with SUD scores maintained at extremely low levels. At 3-month follow-up, the client's stability persisted.

In FT treatment, therapists often observe that after each set of flash interventions, new emotions/sensations/memories emerge or change, accompanied by reduced subjective distress (Wong, 2019). Treatment effects primarily manifest as traumatic memories becoming vague, faded, and distant after treatment (Yasar et al., 2019), thereby effectively reducing SUD and related negative emotions from traumatic memories (Manfield et al., 2017), improving trauma-related anxiety, intrusion, avoidance, overall trauma stress, and psychological quality of life symptoms (Yasar et al., 2022). Across all studies, no adverse reactions such as dissociation, resistance, or emotional collapse were reported.

(1) Case Reports

To date, several FT case studies have been published, including different genders, trauma types, and ages (both adults and children), confirming that FT can effectively improve PTSD symptoms, ameliorate dissociative experiences, reduce depression levels (Wong, 2019), decrease SUD scores (Manfield et al., 2017; Shebini, 2019; Wong, 2019), with therapeutic effects remaining stable during 10-180 day follow-ups (Manfield et al., 2017). Some studies also found that FT can help treat dissociative identity disorder (DID) by processing traumatic memories within it (Shebini, 2019). Currently, all published case studies have yielded positive results; however, case study conclusions are insufficient to support FT's effectiveness, requiring more rigorous and large-scale research designs for verification.

(2) Group Interventions

In intervention practice, FT can be used for both individual and group interventions. To validate the therapy's effectiveness with larger samples, most existing studies employ group intervention formats. Against the backdrop of the recent COVID-19 pandemic, most studies have adopted online intervention methods. Research found that online group interventions can also achieve good results, with easy operability and non-invasiveness, capable of intervening with large groups, making it more economical and convenient than other therapies.

Six hundred thirty-one therapists participated in an online FT intervention, during which participants processed two personal memories each. Results showed that SUD scores significantly decreased after intervention and remained low at 1-month follow-up (Manfield et al., in press). However, this study has important limitations: it lacked a control group, and participants were therapists seeking FT training rather than actual clients seeking treatment.

An online intervention was conducted with 175 healthcare workers affected by COVID-19, lasting 60 minutes, with the first 30 minutes dedicated to psychoeducation and FT introduction, followed by two 15-minute FT intervention ses-

sions. Results found that participants who received both intervention sessions on the same traumatic memory reported significantly greater SUD reduction at post-intervention and 1-week follow-up compared to those who received interventions on different traumatic memories. However, this study also lacked a control group, only measured short-term SUD reduction without examining whether broader symptom relief occurred, and had uncertain follow-up timing (all over 1 week) with fewer participants completing post-measurement (66 individuals) (Manfield et al., 2021).

(3) Randomized Controlled Trial Studies

Currently, few randomized controlled trial (RCT) studies on FT exist, though many researchers have noted this deficiency and begun corresponding research (Konuk, 2019). Researchers (Yasar et al., 2022) randomly assigned 68 participants who had experienced traffic accidents within 6 months to 10 years into two groups: one receiving FT intervention and one receiving Improving Mental Health Training for Primary Care Residents (mhGAP). Both groups received three group sessions, with post-tests conducted one week and one month after intervention. The first post-test revealed that the FT group showed significant reduction in PTSD symptoms, decreased depression and anxiety levels, and significantly improved overall mental health, maintained at the second post-test; the mhGAP group showed significant PTSD symptom reduction and decreased depression at both post-tests, but no significant changes in anxiety or overall mental health. The FT group's PTSD symptom improvement and anxiety reduction were significantly better than the mhGAP group. This RCT further confirmed FT's effectiveness; however, the study lacked a control group, had short follow-up duration, used only self-report data without clinical assessment, and had high attrition (only 39 completed all procedures), requiring more rigorous research to further validate FT's clinical effects.

3.3 Comparison Between FT and EMDR Researchers (Brouwers et al., 2021) randomly assigned 60 non-clinical participants into two groups: one receiving FT intervention and one receiving EMDR intervention, with post-tests conducted immediately after intervention and one week later. Results showed that both FT and EMDR significantly reduced participants' SUD and traumatic memory vividness, with no significant difference in intervention effects. However, FT group ratings for intervention comfort and acceptance were significantly higher than the EMDR group. This study demonstrates that FT can serve as an independent therapy producing intervention effects similar to EMDR, with potentially better patient comfort and tolerability.

As an emerging therapy derived from EMDR, FT shares connections with EMDR but also has many differences. Specifically:

Connections between the two therapies: First, similar basic principles. Both therapies operate through BLS and other methods to reduce the subjective distress and vividness of traumatic memories, thereby producing therapeutic ef-

fects. Second, similar treatment processes. Both include main stages such as history taking, preparation, assessment, desensitization, closure, and reevaluation. Third, similar treatment effects. Research (Brouwers et al., 2021) comparing FT and EMDR treatment effects found no significant differences, though FT received higher client satisfaction and tolerability ratings.

Differences: First, whether trauma exposure is required. FT's approach to exposure involves first objectifying the traumatic memory, placing it in an imagined container, and "closing" it without touching it. Subsequently, counselors do not guide clients to recall trauma content and details but intentionally guide them to discuss, recall, and think about positive memories or images, intermittently interrupting their narrative and recall by asking them to blink, gradually reducing the vividness and distress of traumatic memories. EMDR techniques require counselors to guide clients to recall specific times, content, and details of traumatic memories, then interfere with trauma recall through guided eye movements. Second, whether adverse reactions exist. EMDR requires clients to recall traumatic memories, which may cause some clients to experience dissociation, emotional collapse, and other issues, whereas FT almost never touches trauma details and no adverse reactions have been observed in clinical practice. Third, whether resources are directly implanted. EMDR protocols directly attempt to implant adaptive beliefs, while FT protocols almost never do so; its treatment effects may come more from the unconscious level, thus requiring more exploration of neural mechanisms. Fourth, blinking versus eye movement. In techniques interfering with traumatic memory vividness, FT requires clients to blink upon counselor instruction, while EMDR requires clients to follow the counselor's finger with their eyes; the physiological mechanisms triggered by these two activities may differ.

In summary, EMDR and FT share certain similarities but have gradually separated in practice, producing sufficiently large differences. Comparatively, EMDR has a longer development history and is relatively more mature, but also has some shortcomings. Current research suggests that FT, as an independent therapy, can well compensate for these shortcomings, though more scientific research is needed for further confirmation.

4. Mechanism of Action of Flash Technique

Currently, FT has relatively rich clinical applications and research, but studies involving its internal mechanisms remain scarce and require further in-depth exploration. What psychophysiological mechanisms can better explain subjects' emotional changes and symptom improvement in FT? FT shares many similarities with EMDR, but FT does not require trauma exposure or resource implantation. How do their mechanisms differ? These are questions of particular interest to researchers.

4.1 Psychological Mechanisms One reason for FT's effectiveness is that it fundamentally reduces the time clients access traumatic memories, preventing

re-experiencing trauma. FT does not give clients sufficient time to obtain clear memories, making it difficult for them to think specifically—this may interrupt clients’ conscious defenses against accessing memories. Repeatedly alternating between neutral present states and past memories without emotion allows clients to experience the present, learn to distinguish past from present (Manfield et al., 2017), gradually reducing the vividness of traumatic memories and decreasing negative emotional activation (Brouwers et al., 2021).

FT’ s therapeutic effects may also stem from counterconditioning that leads to fear extinction. Counterconditioning refers to learning a new conditioned response to replace or “counter” maladaptive responses, proven effective in reducing fear stimuli in laboratory experiments (Kang et al., 2018) and an effective technique for treating anxiety and trauma-related disorders (Daneshvar et al., 2021; Newall et al., 2017). Contemporary models of classical conditioning predict that extinction occurs when a conditioned stimulus (CS) is presented without unpleasant consequences, not triggering an unconditioned stimulus (US) (Craske et al., 2014). In FT, clients are asked to briefly shift to aversive traumatic memories after experiencing strong positive experiences. At this time, clients remain in a positive state, and traumatic memories (CS) do not immediately trigger aversive reactions (US), thus reducing fear.

Additionally, FT’ s therapeutic effects may originate from clients continuously adopting more observer positions toward traumatic memories, allowing their adaptive adult perspective to enter awareness. FT technology may establish new neural pathways between traumatic memory networks and memory networks associated with these new perspectives, potentially helping correct cognitive distortions and making it easier to accept traumatic memories (Manfield et al., 2017).

4.2 Physiological Mechanisms Some research suggests that FT’ s mechanism of action is consistent with EMDR. Due to limited human working memory capacity, when simultaneously performing dual tasks, it is difficult to remember disturbing memories, leading to reduced emotionality and vividness of traumatic memories, which are then reconsolidated in altered form (Hout & Engelhard, 2012). According to working memory theory, the positive imagery and blinking in FT technology may simply be another form of dual task. From this perspective, promoting competition between tasks could enhance intervention effectiveness (Matthijssen et al., 2021). However, this implies that memory activation is crucial and should be maximized, which contradicts FT’ s discouragement of trauma exposure. Therefore, FT may have unique mechanisms of action.

FT requires clients to focus on cognitive tasks while rapidly blinking upon hearing instructions—this task is FT’ s unique, core technique, necessitating focused examination of its mechanism. Researchers (Nakano et al., 2013) believe that spontaneous blinking during cognitive-behavioral processes causes the Salience Network to instantly switch from the central executive network focusing on

positive imagery to the default mode network, then switch back to positive imagery. The blinking process helps clients disengage attention from external stimuli, gradually disengaging attention from traumatic memories, blurring images, sounds, and emotions in traumatic memories, and improving attentional bias. Simultaneously, it can be hypothesized that during intentional blinking, as traumatic memories enter working memory, the salience network including overactivated and reflexive periaqueductal gray (PAG) switches from positive imagery to traumatic memory. At the brain structure level, PAG may sense reminders of traumatic memory and reflexively activate the amygdala. Conversely, due to enhanced connectivity between the amygdala and left hippocampus in PTSD patients, the brain rapidly activates the left hippocampus (Terpou et al., 2019) and briefly accesses traumatic memory before returning to positive imagery. During brief access, the amygdala has no time to enter an overactivated state and remains regulated by the prefrontal cortex (PFC). Traumatic memory and activated amygdala (regulated by activated PFC) can coexist, meaning that when briefly facing overwhelming threats, fear remains controlled, which may facilitate memory reconsolidation. Repeatedly accessing traumatic memories very briefly can enhance connectivity between PFC and amygdala while allowing memory reconsolidation to proceed (Wong, 2021). From another perspective, neuroscience research on subconscious exposure shows that amygdala activation can inhibit rapid reprocessing of memory (Siegel et al., 2020). Therefore, during treatment targeting traumatic memories, amygdala activation should be maximized, and BLS in FT can be viewed as a method to activate the amygdala—a concept supported by a functional magnetic resonance study (de Voogd et al., 2018).

4.3 Comparison Between FT and EMDR Researchers have proposed several theories to explain EMDR's mechanisms, such as the orienting and relaxation response hypothesis (Barrowcliff et al., 2003), limited working memory resources theory (Hout et al., 2011), and more complex neurobiological models (Stickgold, 2002).

As previously mentioned, FT and EMDR share commonalities and differences in operation, and their mechanisms are both connected and distinct. Their commonalities include: First, reducing memory vividness and emotional activation. Through self-report measures, reaction time experiments (Hout et al., 2012), and functional magnetic resonance imaging (Thomaes et al., 2016), research has found that eye movements during memory retrieval in EMDR reduce memory vividness and emotional activation (Jeffries & Davis, 2012), thereby desensitizing clients to traumatic memories, implanting positive beliefs, and producing good therapeutic effects. Second, occupying limited working memory resources (Hout & Engelhard, 2012). Through eye movements and other modalities, clients are required to simultaneously perform dual tasks, occupying their working memory resources to alter and reconsolidate memories. Third, using counterconditioning to promote fear extinction (Daneshvar et al., 2021; Newall et al., 2017). By learning a new conditioned response to replace or “counter”

maladaptive responses, clients' trauma-related emotions are alleviated.

Differences include: First, physiological mechanism differences caused by different eye movement patterns. EMDR requires clients to follow the counselor's guidance to move their gaze, while FT requires clients to blink according to the counselor's instructions; their impacts on cognition and brain neural networks may differ (Wong, 2021). Second, whether traumatic memories are activated. EMDR requires clients to focus on traumatic memories during treatment, while FT avoids contacting traumatic memories as much as possible; the underlying mechanisms may differ (Wong, 2021), but await further exploration and research.

5. Summary and Outlook

5.1 Assessment of Treatment Effects and Mechanisms In summary, in the field of trauma intervention, a considerable number of studies provide evidence for FT's effectiveness, but further experimental research is needed for verification. Research indicates that FT is not merely an extension and expansion of EMDR; the two differ in mechanisms of action. For FT, future research should not only emphasize efficacy studies but also prioritize mechanism and process studies, focusing particularly on its physiological mechanisms and cognitive processing.

5.2 Advantages of FT (1) Low invasiveness, high tolerability, few adverse reactions

FT does not require clients to expose trauma or recall traumatic memory details, distinguishing it from most trauma-related therapies that use trauma exposure as their core technique. Exposure-based treatments allow some patients to receive safe trauma reminders and habituate to eliminate learned fear responses, but may also cause negative emotions such as tension and fatigue in some patients, leading to dissociation, inability to continue treatment, and other adverse reactions. FT can process trauma without exposing traumatic memories, reducing clients' subjective distress and helping them achieve healthier psychological states.

(2) Economical, rapid, and easy to promote

FT shows quick results, requires no additional homework, allows continuous intensive intervention, and can alleviate clients' suffering as quickly as possible. Additionally, multiple studies have shown that FT can be conducted via online group intervention, simultaneously treating many clients with relatively low treatment costs and easier large-scale promotion.

5.3 Limitations and Future Directions of FT as a New Therapy Currently, FT's clinical applications and related research have made certain progress, but overall remain in the initial stage. In application, a complete, standardized, and normalized intervention protocol has not yet been formed; in research, more

standardized experimental designs and research procedures are still needed to further verify its treatment effects and explore its mechanisms.

(1) Continue verifying clinical effects

First, existing intervention studies still have issues such as lack of control groups, relatively few RCT studies, short follow-up periods, small sample sizes, limited measurement methods, gender imbalance, and high attrition rates, making it difficult to fully confirm clinical effects. For example, Wong (2019) had only 5 male subjects without a control group and did not conduct adequate follow-up measurement of post-intervention effects, making it impossible to determine whether intervention effects persisted. Manfield et al. (2021) had 175 subjects, 92% female, also lacked a control group, had uncertain follow-up timing (all over 1 week), had fewer participants completing post-measurement (66 individuals), and only assessed SUD levels without evaluating whether this translated to broader symptom relief. Future intervention studies should adopt more rigorous RCT designs, select sample sizes with high statistical power, use longer-term longitudinal follow-up, and employ richer, multi-level efficacy indicators to conduct in-depth evaluation of FT's clinical effects and obtain more rigorous conclusions. In this regard, the authors' research team is conducting longitudinal follow-up research based on RCT design, hoping to further verify FT's clinical effects.

Second, although increasing research shows FT can help individuals with traumatic experiences, existing studies are basically concentrated in North America, South America, and European countries, with few studies exploring whether this therapy is similarly applicable to trauma populations in non-Western countries like China. Chinese traditional culture emphasizes "restraint," "not airing dirty laundry," and "drowning sorrows in wine." Existing research indicates that Chinese concepts of "face" affect stigma among mental illness patients in China (Yang, 2007), and trauma-experienced individuals may also experience certain stigma, fearing being defined as having insufficient personal psychological resilience (Yang & Kleinman, 2008) and unwilling to seek high-intensity interventions. In FT, clients need not expose details of traumatic events or even consciously recall them to process their commonly experienced shame and guilt, perhaps making it more suitable for Chinese people reluctant to expose trauma. Therefore, FT, as a low-invasive method, could be applied in clinical practice and tested for effectiveness in the Chinese cultural context to help trauma-experienced groups process traumatic experiences and improve mental health. Cross-cultural studies could also compare subjects from different cultural backgrounds to reveal similarities and differences, aiming to construct psychological therapies more suitable for Chinese culture and psychological characteristics.

(2) In-depth exploration of mechanisms

Currently, FT has relatively rich clinical practice and research abroad, but in-depth research on its mechanisms remains insufficient. Most researchers discuss FT based on previous studies from working memory and neural mechanisms per-

spectives, but still lack sufficient empirical research to complete the theoretical framework. Overall, researchers have proposed many hypotheses and explanations for the roles of BLS, positive imagery, and blinking in FT, but have not yet verified them through complete experimental designs. Multiple studies have found that EMDR benefits patients' brain function recovery (Bossini et al., 2007); whether FT has similar effects awaits future research. Since FT protocols almost never attempt to consciously implant adaptive beliefs, its therapeutic effects may come more from the unconscious level, thus requiring more exploration of neural mechanisms. Many studies have focused on trauma's effects on brain structure. To date, relatively consistent conclusions are that the hippocampus, amygdala, and prefrontal cortex are core brain regions affected by traumatic experiences (Teicher et al., 2012). Trauma may also cause changes in resting-state functional connectivity, mainly including functional connectivity between the amygdala, hippocampus, orbitofrontal cortex, anterior cingulate, and other brain regions (Thomason et al., 2015; van der Werff et al., 2013). Under specific tasks, trauma-exposed individuals and non-trauma individuals show different brain activation patterns; for example, children with trauma experiences show amygdala overactivation during emotional tasks (Goff et al., 2013). Therefore, future research could use cognitive neuroscience methods to examine FT's neural mechanisms, focusing on the above trauma-related brain regions and whether FT helps restore patients' brain structure and functional connectivity. For example, using fMRI technology to spatially examine FT's neural basis; using ERP technology to explore activation of various cortical brain regions by FT's positive imagery, BLS, and blinking at different time points during intervention; and combining multimodal brain imaging technology for further research on FT's brain mechanisms.

(3) Optimize and enrich measurement methods

Currently, measurement of FT efficacy mainly relies on individuals' subjective reports, mostly using Wolpe's (1958) Subjective Units of Disturbance (SUD), Blevins et al.'s (2015) Post-Traumatic Stress Disorder Checklist DSM-5 (PCL-5), Weiss's (2007) Impact of Event Scale-Revised (IES-R), and others. This method has limitations such as social desirability effects and common method bias, with limited dimensions for measuring subjects' mental health status. Future research could combine self-report and other-report methods, broadening measurement of subjects' cognition, emotion, personality, behavior, neural mechanisms, and other aspects to more deeply understand FT's efficacy and mechanisms. Some research suggests that negative attentional bias is a cognitive risk factor for depression (Disner et al., 2011) and can mediate the relationship between childhood trauma experiences and depressive emotions (Mao, 2020). FT requires frequent and brief attentional shifts to gradually disengage from traumatic memories and improve attentional bias. Therefore, eye-tracking technology could be used to measure subjects' attentional bias before and after FT intervention to explore whether FT helps improve mental health status by correcting negative attentional bias in trauma-experienced individuals.

(4) Gradually expand application areas

First, for individuals experiencing special events (such as earthquakes, fires, floods, and other disasters) or special occupations (such as firefighters, medical personnel), FT's advantages should be considered. FT treatment does not require exposure to or recall of traumatic experiences, can be conducted with multiple people simultaneously, and clients' distress levels decrease relatively quickly after just one session. Additionally, high client tolerability means reduced therapist burden and can decrease negative impacts such as secondary traumatization (Canfield, 2005). Based on these rapid, convenient, and low-side-effect characteristics, FT may be particularly suitable for post-disaster rescue and occupational protection in critical situations, representing a future development direction.

Second, exploring FT's new model of "psychological intervention + psychoeducation." Multiple studies have confirmed FT's safety, tolerability, and convenience, for example, its ability to use online formats (Brouwers et al., 2021; Yasar et al., 2022), intervene with larger samples (Manfield et al., 2021), and a recent study simultaneously conducted FT online intervention with 500 people without finding adverse outcomes or decreased effectiveness (Manfield et al., in press). Future research could further explore whether a standardized and effective intervention protocol can be developed to create a self-service psychological service system for individuals needing to process traumatic memories but not meeting clinical criteria, conducting more promotable online interventions and mental health education.

References

- Chen, Z., Ma, J., Xu, G. M., & Yin, H. F. (2017). Exposure rate of traumatic events and its relationship with major depressive disorder in Tianjin community population. *Tianjin Medical Journal*, 45(12), 1320-1323.
- Mao, Y. (2020). *The influence of childhood trauma on depressive emotions and its neural mechanisms* (Doctoral dissertation). Southwest University, Chongqing.
- Shao, N., Ma, X., Song, X. B., He, T. T., & Wan, Y. H. (2018). Association between childhood abuse and psychological sub-health among medical college students. *Modern Preventive Medicine*, 45(11), 2004-2008.
- Wei, Z. G., Rong, D. S., Yang, Y. J., Qiu, R. Y., & Li, X. Y. (2018). Study on the mediating role of personality factors in the effect of childhood abuse on depression in adult women. *Frontiers of Medicine*, 8(23), 348-350.
- Wu, K. K., & Li, M. (2014, July). *Post-traumatic stress disorder and grief: Preliminary survey results from a large-scale epidemiological study in Hong Kong*. Proceedings of the 2014 International Conference on Trauma and Stress and the 2nd Annual Academic Conference of the Behavioral Medicine Branch of

Zhejiang Medical Association (pp. 20-21). Zhejiang Association for Science and Technology, Hangzhou.

Yu, H. H., Fu, W. Q., Cao, W. S., Cao, F. L., Shen, Q., & Yao, S. Q. (2006). Study on childhood traumatic experiences in college students with cluster B personality disorders. *Chinese Journal of Clinical Psychology*, 14(6), 593-595.

Zhang, X. P., Shi, H. Y., Li, D., & Wang, S. J. (2010). Review of research on eye movement desensitization and reprocessing therapy. *China Journal of Health Psychology*, 18(11), 1401-1404.

American Psychiatric Association. (2004). Practice guideline for the treatment of patients with acute stress disorder and posttraumatic stress disorder. *American Journal of Psychiatry*, 161(Suppl. 11), 3-31.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington DC: Author.

Barrowcliff, A. L., Gray, N. S., MacCulloch, S., Freeman, T. C. A., & MacCulloch, M. J. (2003). Horizontal rhythmical eye movements consistently diminish the arousal provoked by auditory stimuli. *British Journal of Clinical Psychology*, 42, 289-302.

Becker, C. B., Zayfert, C., & Anderson, E. (2004). A survey of psychologists' attitudes towards and utilization of exposure therapy for PTSD. *Behaviour Research and Therapy*, 42(3), 277-292.

Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The posttraumatic stress disorder checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress*, 28(6), 489-498.

Bossini, L., Tavanti, M., Calossi, S., Lombardelli, A., Polizzotto, N., Galli, R., ...Castrogiovanni, P. (2007). P.1.e.006 the effect of eye movement desensitization and reprocessing (EMDR) treatment in hippocampal volumes of post-traumatic stress disorder patients. *European Neuropsychopharmacology*, 17(10), S283-S284.

Brouwers, T. C., de Jongh, A., & Matthijssen, S. J. M. A. (2021). The effects of the flash technique compared to those of an abbreviated eye movement desensitization and reprocessing therapy protocol on the emotionality and vividness of aversive memories. *Frontiers in Psychology*, Article e741163. <https://doi.org/10.3389/fpsyg.2021.741163>

Canfield, J. (2005). Secondary traumatization, burnout, and vicarious traumatization: A review of the literature as it relates to therapists who treat trauma. *Smith College Studies in Social Work*, 75(2), 81-101.

Committee on Treatment of Posttraumatic Stress Disorder. (2008). *Treatment of posttraumatic stress disorder: An assessment of the evidence*. Washington, D. C: National Academy of Sciences.

Copeland-Linder, N. (2008). Posttraumatic stress disorder. *Pediatrics in Review*, 29, 103-104.

Craske, M. G., Treanor, M., Conway, C. C., Zbozinek, T., & Vervliet, B. (2014). Maximizing exposure therapy: An inhibitory learning approach. *Behaviour Research & Therapy*, 58, 10-23.

Daneshvar, S., Taghavi, M. R., Goodarzi, M. A., & Jobson, L. (2021). Emotionally valenced and modality-specific dual tasks: Effects on voluntary reminding and proactive interference in trauma-exposed individuals suffering from PTSD. *Psychological Trauma: Theory, Research, Practice and Policy*, 13(5), 586-595.

de Voogd, L. D., Kanen, J. W., Neville, D. A., Roelofs, K., Fernández, G., & Hermans, E. J. (2018). Eye-movement intervention enhances extinction via amygdala deactivation. *The Journal of Neuroscience*, 38(40), 8694-8706.

Department of Veterans Affairs & Department of Defense. (2010). VA/DoD clinical practice guideline for management of post-traumatic stress. Washington, DC. Retrieved August 19, 2022, from https://storage.googleapis.com/edcompass/quantum/materials/5146_{S Assessment-Diagnosis-ASD.pdf

Disner, S. G., Beevers, C. G., Haigh, E. A. P., & Beck, A. T. (2011). Neural mechanisms of the cognitive model of depression. *Nature Reviews Neuroscience*, 12(8), 467-477.

Goff, B., Gee, D. G., Telzer, E. H., Humphreys, K. L., Gabard-Durnam, L., Flannery, J., & Tottenham, N. (2013). Reduced nucleus accumbens reactivity and adolescent depression following early-life stress. *Neuroscience*, 249, 129-138.

Herman, J. L. (1992). Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. *Journal of Traumatic Stress*, 5(3), 377-391.

Hout, M., & Engelhard, I. M. (2012). How does EMDR work? *Journal of Experimental Psychopathology*, 3(5), 724-738.

Hout, M., Engelhard, I. M., Rijkeboer, M. M., Koekebakker, J., Hornsveld, H., Leer, A., Toffolo, M. B. J., & Akse, N. (2011). EMDR: Eye movements superior to beeps in taxing working memory and reducing vividness of recollections. *Behaviour Research and Therapy*, 49(2), 92-98.

Hout, M., Bartelski, N., & Engelhard, I. M. (2012). On EMDR: Eye movements during retrieval reduce subjective vividness and objective memory accessibility during future recall. *Cognition & Emotion*, 27(1), 177-183.

Infurna, M. R., Reichl, A., Parzer, P., Schimmenti, A., Bifulco, A., & Kaess, M. (2016). Associations between depression and specific childhood experiences of abuse and neglect: A meta-analysis. *Journal of Affective Disorders*, 190, 47-55.

Jeffries, F. W., & Davis, P. (2012). What is the role of eye movements in eye movement desensitization and reprocessing (EMDR) for post-traumatic stress

disorder (PTSD)? A Review. *Behavioural & Cognitive Psychotherapy*, 41(3), 290-300.

Kang, S., Vervliet, B., Engelhard, I. M., van Dis, E. A., & Hageraars, M. A. (2018). Reduced return of threat expectancy after counterconditioning versus extinction. *Behaviour Research & Therapy*, 108, 78-84.

Kessler, R. C., McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., ...Williams, D. R. (2010). Childhood adversities and adult psychopathology in the WHO world mental health surveys. *British Journal of Psychiatry*, 197(5), 378-385.

Konuk, E. (2019). Investigation of the effect of a single session of "Flash Technique" at a group. *Klinik Psikofarmakoloji Bulteni*, 29, 73-73.

Manfield, P. (2013). *EMDR up close: Subtleties of trauma processing*. Berkeley, CA: Cornucopia.

Manfield, P. (2020). What is the flash technique? The Flash Technique. Retrieved August 14, 2022, from <https://flashtechnique.com/wp/>

Manfield, P., Engel, L., Greenwald, R., & Bullard, D. (2021). A low-intensity group Flash intervention for COVID-19-Related stress in healthcare providers. *Journal of EMDR Practice and Research*, 15(2), 82-89.

Manfield, P., Lovett, J., Engel, L., & Manfield, D. (2017). Use of the flash technique in EMDR therapy: Four case examples. *Journal of EMDR Practice and Research*, 11(4), 195-205.

Manfield, P., Taylor, G., Dornbush, E., Engel, L., & Greenwald, R. (in press). Preliminary evidence for the acceptability, safety, and efficacy of the flash technique. *Journal of EMDR Practice and Research*.

Markowitz, J. C., Petkova, E., Neria, Y., van Meter, P. E., Zhao, Y., Hembree, E., ...Marshall, R. D. (2015). Is exposure necessary? A randomized clinical trial of interpersonal psychotherapy for PTSD. *American Journal of Psychiatry*, 172(5), 430-440.

Matthijssen, S. J. M. A., Brouwers, T. C., van Roozendaal, C., Vuister, T., & de Jongh, A. (2021). The effect of EMDR versus EMDR 2.0 on emotionality and vividness of aversive memories in a non-clinical sample. *European Journal of Psychotraumatology*, 12(1), 1956793. <https://doi.org/10.1080/20008198.2021.1956793>

Mavranouzouli, I., Megnin-Viggars, O., Grey, N., Bhutani, G., Leach, J., Daly, C., ...Pilling, S. (2020). Cost-effectiveness of psychological treatments for post-traumatic stress disorder in adults. *PLoS ONE*, 15(4), Article e0232245. <https://doi.org/10.1371/journal.pone.0232245>

McMillan, T. M., Williams, W. H., & Bryant, R. (2003). Post-traumatic stress disorder and traumatic brain injury: A review of causal mechanisms, assessment, and treatment. *Neuropsychological Rehabilitation*, 13(1-2), 149-164.

- National Collaborating Centre for Mental Health (NCCMH). (2005). *Post-traumatic stress disorder: The management of PTSD in adults and children in primary and secondary care*. London: Gaskell and BPS.
- Nakano, T., Kato, M., Morito, Y., Ltoi, S., & Kitazawa, S. (2013). Blink-related momentary activation of the default mode network while viewing videos. *Proceedings of the National Academy of Sciences of the United States of America*, 110(2), 702-706.
- Newall, C., Watson, T., Grant, K. A., & Richardson, R. (2017). The relative effectiveness of extinction and counter-conditioning in diminishing children's fear. *Behaviour Research & Therapy*, 95, 42-49.
- Schneier, F. R., Neria, Y., Pavlicova, M., Hembree, E., Suh, E. J., Amsel, L., & Marshall, R. D. (2012). Combined prolonged exposure therapy and paroxetine for PTSD related to the world trade center attack: A randomized controlled trial. *American Journal of Psychiatry*, 169(1), 80-88.
- Shapiro, F. (1995). *Eye movement desensitization and reprocessing: Basic principles, protocols and procedures*. New York: Guilford Press.
- Shapiro, F. (2014). The role of eye movement desensitization and reprocessing (EMDR) therapy in medicine: Addressing the psychological and physical symptoms stemming from adverse life experiences. *The Permanente Journal*, 18(1), 71-77.
- Shapiro, F., & Forrest, M. (1997). *EMDR: The breakthrough therapy for overcoming stress, anxiety, and trauma*. New York: Basic Books.
- Shapiro, F., & Maxfield, L. (2003). EMDR and information processing in psychotherapy treatment: Personal development and global implications. New York: Norton.
- Shebini, N. (2019). Flash technique for safe desensitization of memories and fusion of parts in DID: Modifications and resourcing strategies. *Frontiers in the Psychotherapy of Trauma and Dissociation*, 3(2), 151-164.
- Siegel, P., Wang, Z., Murray, L., Campos, J., Sims, V., Leighton, E., & Peterson, P. B. S. (2020). Brain-based mediation of non-conscious reduction of phobic avoidance in young women during functional MRI: A randomised controlled experiment. *Lancet Psychiatry*, 7, 971-981.
- Spinhoven, P., Elzinga, B. M., Hovens, J., Roelofs, K., Zitman, F. G., Oppen, P. V., & Penninx, B. W. (2010). The specificity of childhood adversities and negative life events across the life span to anxiety and depressive disorders. *Journal of Affective Disorders*, 126(1-2), 103-112.
- Stickgold, R. (2002). EMDR: A putative neurobiological mechanism of action. *Journal of Clinical Psychology*, 58(1), 61-75.
- Teicher, M. H., Anderson, C. M., & Polcari, A. (2012). Childhood maltreatment is associated with reduced volume in the hippocampal subfields CA3, dentate

gyrus, and subiculum. *Proceedings of the National Academy of Sciences*, 109(9), 563–572.

Terpou, B. A., Densmore, M., Theberge, J., Thome, J., Frewen, P., McKinnon, M., & Lanius, R. A. (2019). The threatful self: Midbrain functional connectivity to cortical midline and parietal regions during subliminal trauma-related processing in PTSD. *Chronic Stress*, 3, 1–12.

Thomaes, K., Engelhard, I. M., Sijbrandij, M., Cath, D. C., & van den Heuvel, O. A. (2016). Degrading traumatic memories with eye movements: A pilot functional MRI study in PTSD. *European Journal of Psychotraumatology*, 7, 31371.

Thomason, M. E., Marusak, H. A., Tocco, M. A., Vila, A. M., McGarragle, O., & Rosenberg, D. R. (2015). Altered amygdala connectivity in urban youth exposed to trauma. *Social Cognitive and Affective Neuroscience*, 10(11), 1460–1468.

van der Werff, S. J., Pannekoek, J. N., Veer, I. M., van Tol, M.-J., Aleman, A., Veltman, D. J., ...van der Wee, N. J. (2013). Resting-state functional connectivity in adults with childhood emotional maltreatment. *Psychological Medicine*, 43(9), 1825–1836.

Weiss, D. S. (2007). The impact of event scale: Revised. In: *Cross-cultural assessment of psychological trauma and PTSD*. Boston, MA: Springer.

Wolpe, J. (1958). *Psychotherapy by reciprocal inhibition*. Stanford, CA: Stanford University Press.

Wong, S. L. (2018). EMDR-based divorce recovery group: A case study. *Journal of EMDR Practice and Research*, 12(2), 58–70.

Wong, S. L. (2019). Flash technique group protocol for highly dissociative clients in a homeless shelter: A clinical report. *Journal of EMDR Practice & Research*, 13(1), 20–31.

Wong, S. L. (2021). A model for the flash technique (FT) based on working memory and neuroscience research. *Journal of EMDR Practice and Research*, 15(3), 20–31.

World Health Organization. (2018). *International Classification of Diseases, 11th Revision (ICD-11)*. Geneva: Author.

Yang, L. (2007). Application of mental illness stigma theory to Chinese societies: Synthesis and new directions. *Singapore Medical Journal*, 48(11), 977–985.

Yang, L. H., & Kleinman, A. (2008). ‘Face’ and the embodiment of stigma in China: The cases of schizophrenia and AIDS. *Social Science & Medicine*, 67(3), 398–408.

Yasar, A. B., Gundogmus, I., Gunduz, A., & Konuk, E. (2019). Investigation of the effect of single session of “flash technique” at a group. *Klinik Psikofarmakoloji*

Bulteni, 29, 73-73.

Yasar, A. B., Gundogmus, I., Gündüz, A., & Konuk, E. (2021). The effects of single session EMDR flash technique group application on traumatic symptoms. *The Israel Journal of Psychiatry and Related Sciences*, 58(2), 41-46.

Yasar, A. B., Konuk, E., Kavakçi, O., Uygun, E., Gundogmus, I., Taygar, A. S., & Uludağ, E. (2022). A randomized-controlled trial of EMDR flash technique on traumatic symptoms, depression, anxiety, stress, and quality of life with individuals who have experienced a traffic accident. *Frontiers in Psychology*, 13, Article e845481. <https://doi.org/10.3389/fpsyg.2022.845481>

Note: Figure translations are in progress. See original paper for figures.

Source: ChinaXiv –Machine translation. Verify with original.